Combined BA/MD Program

ACADEMIC PROGRAM REVIEW

SELF STUDY

OCTOBER 2014

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INTRODUCTORY SECTION AND BACKGROUND INFORMATION

OA: Executive Summary

The Combined BA/MD Program is a collaboration of the College of Arts & Sciences (A&S) and School of Medicine (SOM) which is intended to help address the need for physicians in rural and under-served areas of New Mexico. Each year, twenty-eight students who are broadly diverse are admitted from high school into the Program and receive a conditional admission to the School of Medicine. The BA/MD Program is funded by the New Mexico State Legislature and provides financial support for students who are committed to practicing medicine in New Mexico's medically under-served communities. The 2013-2014 year saw the admission of the 8th cohort of students into the Program, and so for the first time, a BA/MD cohort occupied each year of our 8 year, two-stage, dual degree program, in which participating students first complete a Baccalaureate degree from the College of Arts & Sciences, and then complete an Doctor of Medicine degree at the School of Medicine.

Students in the BA component graduate with a major or minor unique to the BA/MD Program: Health, Medicine & Human Values (HMHV), which includes: a 15 credit enhanced pre-health humanities and social sciences curriculum; a rigorous basic science curriculum; and a summer practicum immersion experience, in which students live and serve in different rural communities in New Mexico, completing a community health project and shadowing physicians in rural hospitals and clinics.

The undergraduate component of the BA/MD Program is an inter-disciplinary program within Arts & Sciences, and so has "joint-appointment" faculty, with each tenure-track and lecturer faculty member having their "home" in one of Arts & Sciences' departments. As of the fall semester of 2014, the BA/MD Program is comprised of 19 faculty from 11 different departments, all teaching at least one semester per year for the Program, covering nearly all of the required courses in our curriculum. In the first 5-6 years of the Program, only 4-6 joint appointment faculty taught in the Program, with all of the other required courses taught by available faculty on a "catch-as-catch-can" basis. Now, with a committed faculty, many of whom were secured through national searches and formal appointments, the Program's curriculum is not only consistent, but we are able to innovate in areas such as best practices pedagogy, faculty development, course intersection and course integration.

The BA/MD Program's continual and principal challenge is to improve retention of rural and minority students. Several ongoing initiatives to address attrition and retention are discussed in this report, in *Criterion 2 (Teaching & Learning: Curriculum)* and *Criterion 3 (Teaching & Learning: Continuous Improvement)* and these include: new faculty hiring, a new instructional design for the premedical science core, a new summer course for incoming students called *Foundations of Science*, and multiple faculty development initiatives.

Another ongoing goal of the BA/MD Program is to contribute more broadly to the entire undergraduate mission at UNM, particularly in developing Interdisciplinary Health as an area of excellence in the College of Arts & Sciences, both through the hiring of new faculty and through extending our unique HMHV curriculum as a minor to all students at UNM. In the past three years, the BA/MD Program has contributed both bridge funding, as well as ongoing salary

funding based on percentage of teaching load in the Program, to national searches which have hired 8 new tenure-track faculty in: Communications & Journalism, Economics, Philosophy, Sociology, and Biology. The BA/MD Program has also provided one-time bridge-funding to two additional tenure track hires in History of Medicine and Health Psychology. In 2013, UNM's Faculty Senate approved our initiative to extend our HMHV pre-health minor to the entire UNM population. Prior to this, HMHV courses were only offered to those 112 students admitted into the BA/MD Program. Because there is no pre-health or pre-med major or minor on campus, it is the Program's hope that this new HMHV minor will create a "well-lit path" for UNM students interested in pursuing advanced degrees and careers in health and medicine.

OB. Program History

Though the first cohort of BA/MD students was admitted into the Program in the fall of 2006, planning for the new dual-degree program began several years earlier. In 2002 and 2003, Dean Paul Roth of UNM's School of Medicine, along with Dr. Valerie Romero-Leggott and Dr. Ellen Cosgrove, and many other leaders and stakeholders, began discussions with Arts & Sciences Dean Reed Dasenbrock about collaboration between the School of Medicine and the College of Arts & Sciences. This collaboration continued over subsequent years and evolved to include Interim Dean Vera Norwood, of Arts & Sciences, Professor Gary Harrison, of the Department of English, Richard Santos, Professor of Economics, and many others. The Program was envisioned as a response not only to address the physician shortage in New Mexico[1], but also the need for greater diversity of physicians in rural and underserved areas. In 2005, the President of the American Association of Medical Colleges (AAMC) outlined the need to increase the "racial and ethnic diversity of the medical profession." The goals and mission of the BA/MD Program hit both of these marks. A review of the recruitment and retention of primary care physicians published in *Academic Medicine* found that "Pre-medical school factors such as rural upbringing and specialty preference were most strongly correlated with recruitment of physicians to rural areas." In FY 2005, the New Mexico State Legislature first appropriated funds for the planning and development of the BA/MD Program, and in each subsequent year, a multi-phase funding process guaranteed the full implementation of the BA/MD Program.

Administration: Dr. Valerie Romero-Leggott, from the School of Medicine, and Dr. Richard Santos, from the College of Arts & Sciences, served as the founding Directors of the Program. In 2008, Dr. Philip Ganderton became Director for Arts & Sciences. In 2010, Dr. Robert Sapien became Director for the School of Medicine, while Dr. Romero-Leggott assumed the position of Executive Director. In 2011, Professor Greg Martin became Director for Arts & Sciences.

In 2010, the first cohort admitted to the Program graduated from the College of Arts & Sciences and matriculated to the School of Medicine. In May of 2014, students from this first cohort graduated from the School of Medicine.

In the more than eight years since its inception, the BA/MD Program has remained committed to curricular balance between HMHV seminars in the social sciences and humanities and a strong foundation in the premedical core of required basic science courses. While the requirements and

[1] Prior to 2006 (and still), 30 of New Mexico's counties had been federally-designated as Medically Underserved Areas (MUS), and also Health Profession Shortage Areas (HPSA).

courses themselves have remained constant, the Program has placed increasing emphasis on pedagogical innovation and the hiring of a committed joint-appointment faculty who are invested in the Program's mission, the students' success, course integration and professional development. A more in-depth discussion of this is provided in *Criterion 3: Teaching & Learning, Continuous Improvement.*

OC. Organizational Structure and Governance

Administration of the BA/MD Program is shared between the School of Medicine and College of Arts & Sciences. The BA/MD undergraduate Program reports directly to the Dean of the College of Arts & Sciences. The School of Medicine BA/MD Program structurally falls within the SOM Office of Education, while also reporting to the Vice-Chancellor for Diversity.

The Program has operations on both north and main campus. North campus serves as the fiscal agent, and is the recipient of annual funding allocated in line with the Program's goals and mission. Key aspects of the Program are split between both sites. Staff and faculty in the College of Arts & Sciences teach, mentor and advise students in each of the four undergraduate years of the Program. The College of Arts & Sciences has primary responsibility for the curriculum, program advisement, scholarship allocation, and other components of the undergraduate program of the BA/MD Program. The School of Medicine has primary responsibility for the recruitment and admission of high school seniors into the BA/MD Program, as well as the transition, matriculation, and medical education in the School of Medicine.

Figure 0C-1: School of Medicine Organizational Chart

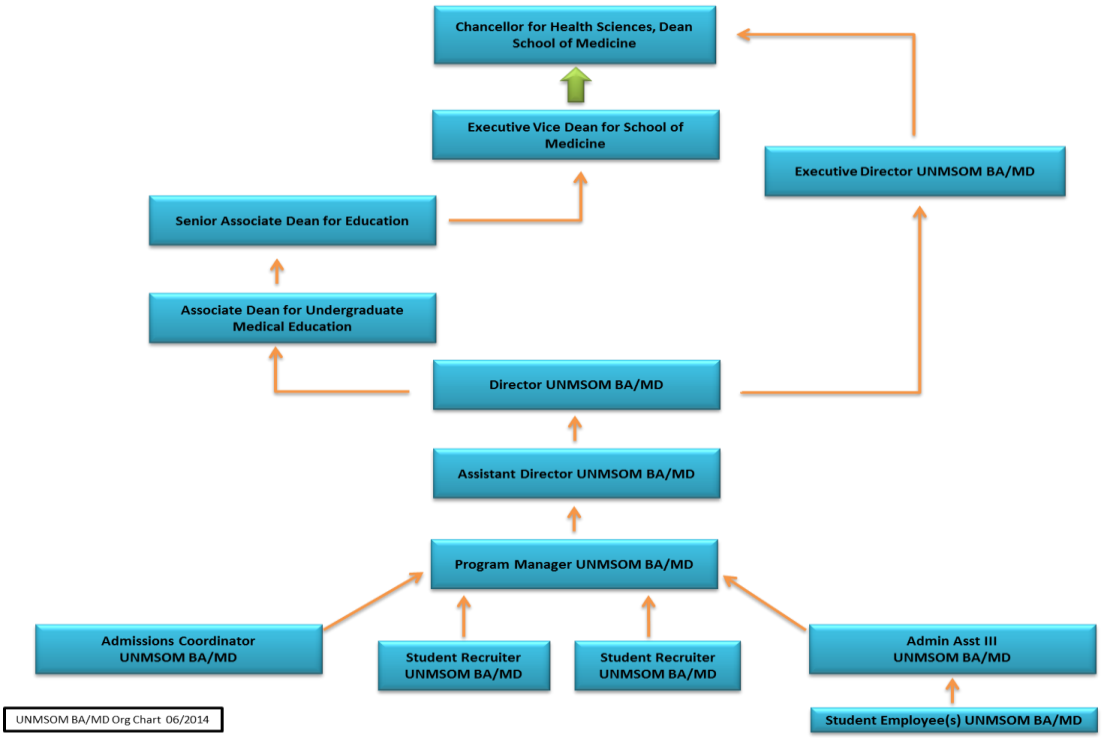
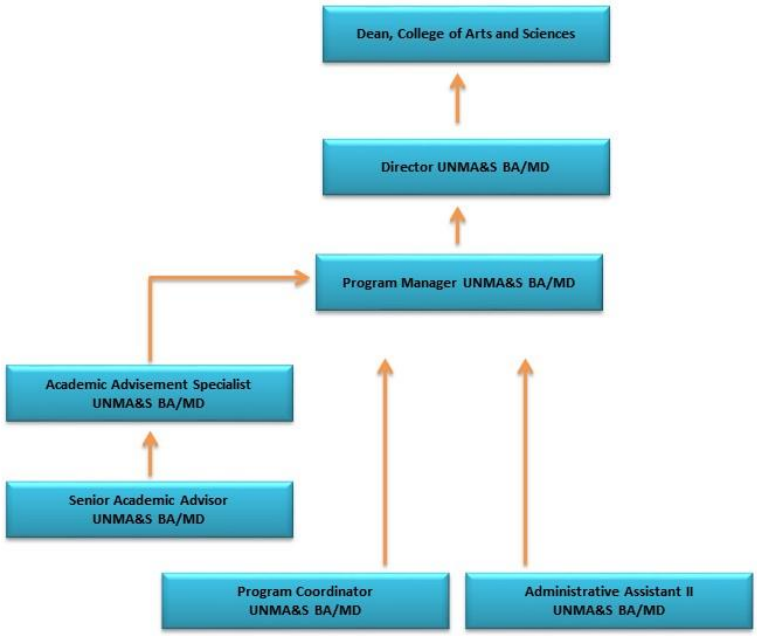


Figure 0C-2: Arts & Sciences Organizational Chart



UNMA&S BA/MD Org Chart 09/2014

OD. External Accreditation

Medical education programs leading to the M.D. degree in the United States and Canada are accredited by the Liaison Committee on Medical Education (LCME). The LCME's scope is limited to complete and independent medical education programs whose students are geographically located in the United States or Canada for their education and that are operated by universities or medical schools chartered in the United States or Canada.

LCME accreditation is a voluntary, peer-review process of quality assurance that determines whether the program meets established standards. This process also fosters institutional and program improvement. To achieve and maintain accreditation, a medical education program leading to the M.D. degree in the U.S. and Canada must meet the LCME accreditation standards contained in the document Functions and Structure of a Medical School. Programs are required to demonstrate that their graduates exhibit general professional competencies that are appropriate for entry to the next stage of their training and that serve as the foundation for lifelong learning and proficient medical care. While recognizing the existence and appropriateness of diverse institutional missions and educational objectives, the LCME subscribes to the proposition that local circumstances do not justify accreditation of a substandard program of medical education leading to the M.D. degree. The UNMSOM Combined BA/MD Program is accredited through the LCME under the parent institution, UNM School of Medicine.

OE. Prior Academic Program Review

The BA/MD was founded in 2006. This is our first Academic Program Review.

CRITERION 1. PROGRAM GOALS

The unit should have stated learning goals for each program and demonstrate how the goals align with the vision and mission of the unit and of the university.

1A. Provide a brief overview of the vision and mission of the unit and how each program fits into the vision and mission of the unit.

The UNM Combined BA/MD Program's mission is to:

I. Provide doctors to rural and medically underserved communities and address the critical physician shortage in the state of New Mexico.
II. Strive to admit and educate a diverse (social, economic, geographical, cultural) group of students committed to staying in New Mexico to practice medicine.
III. Connect students with New Mexico communities and the health care needs of New Mexicans.

The undergraduate component (BA) of the Program meets both goals II & III through educating and graduating a diverse group of students who, through their studies and through service learning built in the curriculum, continually connect with New Mexico's medically underserved communities. The graduate (MD) component of the program addresses the first goal of the Program's mission, through graduating physicians who will go on to live and work in New Mexico's medically underserved communities.

1B. Describe the relationship of the unit's vision and mission to UNM's vision and mission.

This Program's mission addresses the UNM mission statement (Appendix 1) by offering both undergraduate and professional educational programs, partnering with local communities in health-related projects throughout the state which originate from the program's curriculum, and providing essential training and support for the field of medicine and public health in New Mexico. The Combined BA/MD Program augments the university's commitment to meet the health care needs of the state through increasing the total size of the medical school class by 25%. With 2/3 of BA/MD students from under-represented populations, and 2/3 of BA/MD students from rural, medically underserved areas, this Program is one of the University's hallmark diversity pipeline programs, unique not only to UNM, but also in the region and nationally.

1C. List the overall learning goals for each undergraduate within the unit.

Health, Medicine & Human Values: Broad Learning Goals:

Goal A: Students will reflect upon their learning process and experiences and identify and articulate their most effective learning strategies, as well as their strengths and weaknesses as learners.

Student Learning Outcomes (SLO): Students will be able to:

A1. Identify and evaluate areas of achievement and development as students, writers and individuals.
A2. Identify and evaluate their most effective and least effective methods and strategies of learning.

Goal B: Students will develop and demonstrate competencies in the basic sciences and in mathematics and statistics that will prepare them for medical school and medical practice.

Student Learning Outcomes: Students will be able to:

B1. Apply basic principles from chemistry and physics to understanding living systems.
B2. Apply quantitative reasoning to describe or explain phenomena in the natural world.
B3. Apply the process of scientific inquiry to generate hypotheses, design experiments and evaluate data.

Goal C: Students will develop and demonstrate competencies in humanities and social science research methods and written and verbal communication—with an emphasis on understanding the social determinants of health broadly as well as in the specific context of social and cultural diversity in New Mexico—that will prepare them for medical school and for medical practice.

Student Learning Outcomes: Students will be able to:

C1. Analyze, interpret, and evaluate texts and experiences related to medicine and health and communicate in written and verbal form the results.
C2. Conduct research, interpret data related to medicine and health and communicate in written and verbal form the results.
C3. Analyze, interpret and evaluate texts and data related to the social determinants of health to identify the ways differences in race, gender, class, ethnicity and culture affect health and policy.

1D. Explain the manner in which learning goals are communicated to students and provide specific examples.

In the fall of 2013, the BA/MD Program revised its broad learning goals with input from and in consultation with Tom Root, the Outcomes Assessment Manager for UNM, and after extensive discussions with all of our faculty in our Committee on Curriculum and Student Progress (CCSP). These revised learning goals are communicated to students by individual faculty their syllabi, course descriptions, assignments and course content. In addition to this, the BA/MD Program holds mandatory meetings each semester, with each cohort of the BA/MD Program, during a time the students must reserve in which the program administrators and staff conduct presentations on all aspects of the Program, including: an annual academic update presentation, Program mission and goals, policy on professionalism and due process. Also, all freshmen in the Program are required to take HMHV 298, a one credit, semester long class, unique to the Program, in which multiple aspects of student success (time management, stress management, learning strategies, sleep hygiene, test anxiety, etc.), as well as the overall mission and goals of the Program are emphasized. Finally, the goals of the Program are emphasized continually through mandatory advisor meetings, each semester, for each student, in which students develop the semester and degree plans.

1E. Describe the unit's primary constituents and stakeholders.

Figure 1E-1: Program Stakeholders

Internal Stakeholders	External Stakeholders
BA/MD Student & Alumni Population	**NM State Legislature**
SOM Administration & Faculty	**NM Communities**
SOM Departments	**NM Healthcare Workforce**
SOM Office of Diversity & Inclusion	
A&S Administration & Faculty	
A&S Joint Appointment Departments	

1F. Provide examples of how satisfaction of the program goals serves constituents.

The ultimate impact of the Program, and its service to constituents, will be demonstrated by an increased number of physicians practicing in New Mexico. This impact will not be assessable, however, until at least 2016 due to the length of medical training. In order to maximize the success of increasing the number of physicians in New Mexico, the Program:

- Provides a pipeline toward health career opportunities to NM students
- Admits a diverse class of twenty-eight NM students in-line with the mission of the UNMSOM and Program goals and objectives
- Admits and graduates students with a commitment to serve rural and/or underserved areas within New Mexico
- Supports students financially
- Financially supports faculty and departments university-wide to address the requirements of programming and increased SOM class size
- Supports students with enhanced student advisement
- Offers multifaceted course options to the general UNM student population through a specialized HMHV curriculum, which highlights the health care needs of New Mexico
- Offers active learning based delivery of pre-medical science courses
- Graduates students in a timely manner from a rigorous four-year undergraduate curriculum

1G. Provide examples of outreach or community activities (local, regional, national, and/or international) offered by the unit. Provide an assessment of these activities in relation to the unit's educational objectives.

The BA/MD Program prides itself on a strong connection to community and to the recruitment of a class representative of those populations categorized as underrepresented in medicine. The Program works with entities state-wide to further this objective.

Santa Fe Indian School Partnership

In 2007, one year after its inception, the Program, acting as a unit within UNM Health Sciences Center, entered into a collaborative agreement with Santa Fe Indian School (SFIS) located in

Santa Fe, NM. SFIS is a flagship school in Indian Education and is owned and operated by the 19 Pueblo tribes of New Mexico. In line with the UNMHSC commitment to pipeline programs, the collaboration serves to develop and implement post-secondary programming designed to encourage residents of NM to enter into the health professions. Programming supports skills workshops (i.e. writing a personal statement, interviewing, etc.), informational sessions and educational advisement. The programming prepares students for application to the BA/MD Program while offering a sound foundation for career exploration and the resources for a sustainable career path.

HERO Partnership

The Program's collaboration with the Health Extension Rural Office (HERO) also enhances commitment to community outreach. HERO is a community priority health initiative based in the UNM Office of Community Health. HERO Agents currently serve as Community Coordinators for BA/MD students while enrolled in the required practical immersion experience ("Summer Practicum"). HERO Agents live in community, link local health needs with UNM resources, improve local health services and systems, encourage youth to finish school, enter health careers, recruit and retain a local health workforce, bring latest research and health care practices to community, and strengthen community capacity to address local health problems. In their roles as Coordinators, HERO Agents are professional mentors guiding BA/MD students in examining pertinent community health issues from a variety of lenses including a public health perspective. Literature reviews, conversations with community leaders and residents, and observations of health professionals in action all serve to inform student understanding of health topics and issues.

Community Health Practicum ("Summer Practicum")

The Community Health Practicum ("Summer Practicum"), taken for one month on location in a local community in New Mexico during the summer between the second and third year in the Program, is designed to engage students in experiential learning projects involved in community and clinical health. During the Summer Practicum, BA/MD students participate in a community-based program addressing a locally identified health concern. Students spend a minimum of 20 hours per week working on a community engagement activity. Students work extensively with community members, leaders, and healthcare practitioners on an ongoing community program focusing on the processes and activities of a community-engaged intervention. Students also visit other community-based health-related activities, such as: food banks, substance abuse initiatives, senior centers, EMS systems, healthcare for the homeless, early education programs, etc.

During the Summer Practicum, students also "shadow" a healthcare practitioner based in the community. This experience is an opportunity to watch healthcare practitioners interact with their patients and see the variety of medical problems one can expect to encounter as a healthcare practitioner. It provides students with clinical exposure to help link the patients' medical problems with public health concepts in local New Mexico communities.

CRITERION 2. TEACHING AND LEARNING: CURRICULUM

The unit should demonstrate the relevance and impact of the curriculum associated with each program.

2A. Provide a detailed description of curricula for each program within the unit. Include a description of the general education component, required and program-specific components for the undergraduate program. Provide a brief justification for any program within the unit that require over 120 credit hours for completion.

All students in the BA/MD complete a major or minor unique to the program within the university: Health, Medicine & Human Values (HMHV). The BA/MD Program at UNM is one of only a relative few BA/MD Programs to have its own specially-designed major, with its own joint-appointment faculty.

HMHV Academic Program Requirements

Joint Requirements: Options I, II, and III

All students in the BA/MD Program must fulfill the Core Curriculum and Group Requirements for the College of Arts & Sciences as well as all of the requirements for their selected major and concentration. In addition, all BA/MD students must complete 15 credit hours of special seminars designed specifically for participants in the Program, and 6 credit hours of summer community health practica. The combined 21 credit hours of special seminars and community health practica promote cohort building among the BA/MD students and constitute the interdisciplinary and experiential core of the Program.

Health, Medicine and Human Values Seminars (15 credit hours)
The Health, Medicine and Human Values seminars are interdisciplinary courses that provide opportunities for experiential and problem-based learning, applied writing and speaking, and small-group problem solving. The seminars involve collaborative teaching with faculty from the School of Medicine and the College of Arts & Sciences. The seminars are as follows:

HMHV 101. Contours of Health in New Mexico. Seminar exploring ethnic, economic, demographic, and geographic variables impacting public health in New Mexico and the Southwest. Topics include access to health care; local alternatives to medical treatment; cultural definitions of health, illness, and death.

HMHV 201. Literature, Fine Arts, and Medicine. Seminar exploring links among health, illness, literature and the arts, encompassing a diverse range of forms and genres. Topics include representations of health, illness, and medicine; arts as therapy; medical history in literature and art.

HMHV 301. Health Economics, Politics, and Policy. Seminar exploring political and economic forces that impact health care policies and practices. Topics include political and economic forces impacting health care; health care reform; the institutional and political organization of medicine.

HMHV 310. Health and Cultural Diversity. Seminar exploring cultural variables that affect the experience and practice of health and health care: how culture, ethnicity, race, and gender inform ideas of health and illness, death and dying, and the patient-physician relationship.

HMHV 401. Ethics, Medicine, and Health. Seminar exploring ethical and legal considerations that influence medical practices and decision-making. Topics include contemporary ethical and moral issues in medicine; and a comparative and critical analysis of relationship between professional ethics and personal beliefs.

Community Health Practica ("Summer Practicum", 6 credit hours)
The Community Health Practica, taken in the summer after the second or third year in the Program, are designed to allow students to engage in experiential learning projects involved in community and clinical health. The practica enable students to put into practice some of the problem-solving skills and information acquired in the seminars and other parts of the HMHV curriculum. Each practica involves a writing and research component, as well as the experiential component.

HMHV 350. Community Health Practicum I.
HMHV 450. Community Health Practicum II.

Detailed descriptions of the additional requirements for each curriculum option are described below.

Option I: Arts & Sciences Major (B.A. or B.S.)

The Arts & Sciences option enables BA/MD students to choose a major from one of the College of Arts & Sciences degree-granting programs, while completing the structured set of courses designed for the HMHV Program to prepare students for medical school. In addition to completing all departmental requirements for the selected major, students must complete the Health, Medicine and Human Values seminars; the Community Health Practica; and a 45 credit hour Pre-Medical Sciences Core, described below.

Table 2A-1: Option I

OPTION I: ARTS & SCIENCES MAJOR		CREDIT HOURS
1.	**Health, Medicine and Human Values Seminars** (See "Joint Requirements" above).	**15**
2.	**Community Health Practica** (See "Joint Requirements" above).	**6**
3.	**Pre-Medical Sciences Core**	**45**
•	Mathematics: MATH 180 or above and STAT 145	6
•	Biology: BIOL 201L, 202L, and 204/204L	12
•	General Chemistry: CHEM 121/123L and 122/124L	8
•	Organic Chemistry: CHEM 301/303L and 302/304L	8
•	Physics: PHYC 151/151L and 152/152L	8
•	Biochemistry: BIOC 423	3
4.	**Departmental Major Requirements**	**32+**

Option II: Health, Medicine and Human Values Major: Health, Humanities and Society Concentration (B.A.)

This option offers students a structured set of distributed requirements emphasizing the humanities and social sciences, while providing them with a pre-medicine core in mathematics and the physical/natural sciences. Students must complete up to 33 credit hours of distributed course work for the Health, Humanities and Society Concentration (below), and also complete the Health, Medicine and Human Values seminars; the Community Health Practica; and a 45 credit hour Pre-Medical Sciences Core.

Table 2A-2: Option II

OPTION II: HEALTH, HUMANITIES & SOCIETY CONCENTRATION		CREDIT HOURS
1.	**Health, Medicine and Human Values Seminars** (See "Joint Requirements" above).	**15**
2.	**Community Health Practica** (See "Joint Requirements" above).	**6**
3.	**Pre-Medical Sciences Core**	**45**
•	Mathematics: MATH 180 or above and STAT 145	6
•	Biology: BIOL 201L, 202L, and 204/204L	12
•	General Chemistry: CHEM 121/123L and 122/124L	8
•	Organic Chemistry: CHEM 301/303L and 302/304L	8
•	Physics: PHYC 151/151L and 152/152L	8
•	Biochemistry: BIOC 423	3
4.	**Health, Humanities and Society Concentration Requirements:** The Health, Humanities and Society concentration requires 33 credit hours of distributed course work across the arts and sciences, at least 18 of which must be in 300- to 400-level upper-division courses. (Note: in consultation with the BA/MD advisor, students may choose electives within each distribution area other than the recommended courses below.)	**33**
•	Mathematics/Physical & Natural Sciences (9 credit hours, at least 3 of which are 300-level or above).	9
•	Humanities/Fine Arts (9 credit hours, at least 6 of which are 300-level or above).	9
•	Social/Behavioral Sciences (9 credit hours, at least 6 of which are 300-level or above)	9
•	Electives	6

Option III: Health, Medicine and Human Values Major: Biomedical Sciences Concentration (B.A.)

This option emphasizes intensive study in the mathematics and physical/ natural sciences. Students in Option III must complete the Health, Medicine and Human Values seminars; the Community Health Practica; a 61 credit hour Pre-Medical Sciences Core; and 18 upper-division hours of distributed group requirements and electives, as described below.

Table 2A-3: Option III

OPTION III: HMHV: BIOMEDICAL SCIENCES CONCENTRATION		CREDIT HOURS
1.	**Health, Medicine and Human Values Seminars** (See "Joint Requirements" above).	**15**
2.	**Community Health Practica** (See "Joint Requirements" above).	**6**
3.	**Pre-Medical Sciences Core**	**61**
•	Mathematics: MATH 180 and MATH 181	6
•	Biology: BIOL 201L, 202L, 203L and 204/204L	12
•	General Chemistry: CHEM 121/123L and 122/124L	8
•	Organic Chemistry: CHEM 301/303L and 302/304L	8
•	Physics: PHYC 151/151L and 152/152L	8
•	Biochemistry: BIOC 423	3
•	Anatomy & Physiology I & II: BIOL 237/247L and BIOL 238/248L	8
•	Microbiology: BIOL 239L (non-majors) or BIOL 351/351L	4
4.	**Upper Division Electives** The Biomedical Sciences concentration requires an additional 18 hours of course work in 300 to 400-level upper-division courses distributed across the Arts & Sciences Group categories.	**18**

Minor in Health, Medicine and Human Values (21 credit hours)

A. Minor Requirements for students in the BA/MD Program

BA/MD students enrolled in Option I who complete all requirements for the HMHV curriculum—the five seminars (HMHV 101-401), the Community Health Practica (HMHV 350 and 450, which are open only to students in the BA/MD Program), receive an official minor in Health, Medicine and Human Values.

BA/MD students enrolled in Options II and III who complete all requirements for those options receive a major in Health, Medicine and Human Values; there is no minor requirement for either Option II or III.

B. Minor Requirements for students who withdraw or are released from the BA/MD Program

BA/MD students enrolled in Options I, II or III who leave the program after completing 12 credit hours of HMHV seminars plus 6 credit hours of the Community Health Practica (HMHV 350 and 450) may receive a minor in Health, Medicine and Human Values by completing another 3 credit hours of distribution requirements from the list of courses below. Students must achieve a cumulative GPA of 3.00 or above in all 21 credit hours submitted for the HMHV minor. 15 of the 21 credit hours for the minor must be upper-division.

BA/MD students enrolled in Options I, II or III who leave the program after completing 12 credit hours of HMHV seminars may receive a minor in Health, Medicine and Human Values by completing another 9 credit hours of distribution requirements from the list of courses below. Students must achieve a cumulative GPA of 3.00 or above in all 21 credit hours submitted for the HMHV minor. 15 of the 21 credit hours for the minor must be upper-division.

C. Minor Requirements for students outside the BA/MD Program

Students who complete 12 credit hours of HMHV seminars may receive a minor in Health, Medicine and Human Values by completing another 9 hours of distribution requirements from the list of courses below. Students must achieve a cumulative GPA of 3.00 or above in all 21 credit hours submitted for the HMHV minor. 15 of the 21 credit hours for the minor must be upper-division.

Twenty-one credit hours as follows:

Twelve credit hours of the following HMHV seminars:

HMHV 101	Contours of Health in New Mexico	3
HMHV 201	Literature, Fine Arts and Medicine	3
HMHV 301	Health Economics, Politics and Policy	3
HMHV 310	Health and Cultural Diversity	3
HMHV 401	Ethics, Medicine and Health	3

Plus nine credit hours taken from the list of distribution requirements below. At least three credit hours of the distribution requirements must be from a 400-level course. Note: No substitutions are allowed, except in the case of a 400-level special topics course with a clear emphasis in health/medicine. Consult the BA/MD academic advisor. Some of the courses below require pre-requisites, so students must plan accordingly.

ANTH 365	Anthropology of Health
CJ 314	Intercultural Communication
CJ 450	Health Communication
ECON 335	Health Economics
ECON 410	Topics in Health Economics
ENGL 413	Scientific, Environmental and Medical Writing
HIST 416	History of Medicine to 1850
HIST 417	History of Modern Medicine
SIGN 352	Language and Culture in the Deaf Community Part I
PHIL 368	Biomedical Ethics
PSY 324	Infant Development
PSY 329	Adolescent Psychology
PSY 421	Advanced Development Psychology
POLS 376	Health Policy and Politics
SOC 310	Sociology of Aging and the Aged
SOC 340	Sociology of Medical Practice
SOC 420	Race and Cultural Relations

2B. Describe the contributions of the unit to other internal units within UNM, such as offering general education core courses for undergraduate students and courses that fulfill prerequisites of other programs, cross listed courses.

The BA/MD Program is responsible for many contributions to other internal units within UNM:

Faculty & Teaching contributions

Of the 19 joint-appointment faculty teaching for the Program, 13 of these faculty hires were made possible due to funding from the BA/MD Program. (With many of these hires, the BA/MD Program contributed bridge funding which provided the faculty member's first year's full base salary, and then, in years 2 and beyond, salary contribution from the program was based on teaching load in the program.) As a result, 9 different departments were able to add a tenure-track faculty or lecturer, who would then go on to teach more than half of their teaching load (in most cases, ¾ of their load) in that department. In any given year, because of these hires, departments in A&S are offering more than thirty additional classes by nationally recognized experts in their discipline, who are also conducting research, applying for and receiving grants, etc.

The HMHV Minor

Beginning in the spring of 2013, the BA/MD Program began offering HMHV seminars, for the first time, to students in the general UNM population. (Prior to this spring, HMHV courses were only offered to those 112 students (28 per year over 4 years) admitted into the BA/MD Program.) Also in spring of 2013, the BA/MD Program's initiative to introduce an HMHV pre-health minor to the entire UNM population was approved by the Faculty Senate. So, since the fall of 2013, students now are pursuing an HMHV minor (see curriculum description in 2A above). Prior to the HMHV minor, there was no pre-health or pre-med minor on campus, and there was also no pre-health or pre-med specific advisor in the college (outside the BA/MD program). The two BA/MD advisors now provide advisement for all students at UNM pursuing the HMHV minor. The HMHV minor provides a "well-lit path" for UNM students interested in pursuing advanced degrees and careers in health and medicine. These HMHV courses are also available to pre-health and pre-med students in general UNM population who are on the BA/MD admissions waitlist, eligible for the BA/MD "Merge Program" admissions cycle, which comes at the end of the sophomore year.

Contributions in Active Learning in the Pre-Med Core

Beginning in fall of 2012, the Program, for the first time, had joint appointment faculty teaching all of the courses in our pre-med required sequence:

General Chemistry I & II	Chem 121, 122
Organic Chemistry I & II	Chem 301, 302
Biochemistry	Biochem 423
Molecular & Cell Biology	Bio 201L
Genetics	Bio 202L
General Physics I & II	Phys 151, 152

At this time, the Program established agreements with chairs in these departments so that all of the above pre-medical science core classes would be limited to a capacity of 50 students (rather than 200-300). These classes *were to be filled equally with BA/MD students and traditional UNM undergraduates.* These courses emphasize active and problem-based learning techniques, with a specific emphasis on pre-medicine.

2C. Describe the modes of delivery used for teaching courses.

The BA/MD Program uses a variety of modes for delivery its courses, including seminar large and small group discussion, lecture, active learning and problem-based learning, on-site service learning, as well as incorporating web-enhanced tools such as blackboard learn. As much as this, the BA/MD Program prides itself on being a leader and contributor to innovative approaches in best practices pedagogy. For a further discussion of innovative approaches in modes of delivery, please see section *3C: A New Instructional Design for the Premedical Science Core*, as well as *Appendix 2: Curricular redesign in basic science classes that form the core sequence of pre-medical classes taken by BA/MD students.*

CRITERION 3. TEACHING AND LEARNING: CONTINUOUS IMPROVEMENT

The unit should demonstrate that it assesses student learning and uses the assessment to make program improvements.

3A: Describe the assessment process and evaluation of learning goals for each program. Provide information on how the unit assesses the effectiveness of its curricula and teaching effectiveness in meeting the educational objectives described in Criterion 1. Summarize and discuss direct and indirect evidence of students' learning gathered by the program. For accredited programs, the unit should utilize outcomes measures that are responsive to the accreditation expectations.

The BA/MD Program conducts assessment through two groups working collaboratively with one another: (1) The Office of Program Evaluation, Education and Research (PEAR) of the School of Medicine, (2) the Assessment Subgroup of the Committee on Curriculum & Student Progress (CCSP).

Assessment: PEAR

The Office of Program Evaluation, Assessment and Research (PEAR) at UNM's School of Medicine provides evaluation support for the BA/MD Program. Undergraduate BA/MD students evaluate the Program at the end of each fall and spring semester. The evaluations ask students to give feedback on their commitment to the program goals, to evaluate the coursework in general and specific terms, to rate their counselling, financial and living arrangements, and to comment on student stress and well-being. The survey forms are fairly consistent across cohorts and semesters although the course titles and instructor names change each semester. At the end of the fourth year of the undergraduate BA/MD Program, the evaluation survey includes statements on overall satisfaction with the BA/MD Program and asks about preparation for the Medical College Admission Test (MCAT). The PEAR office collates the survey results and creates several reports from each survey administration. One report contains all comments along with frequencies of responses; this report is given to the BA/MD leadership group. Another report contains edited comments and frequency of responses. Comments are edited such that negative comments that contain faculty or staff names are removed. These reports are shared with BA/MD faculty and staff. Lastly, PEAR creates a report consisting of frequency of responses only; this report is shared with BA/MD students electronically. Students may review the survey including comments in the BA/MD office at any time.

Assessment Subgroup of the CCSP

Working with Chris Butler and Tom Root, assessment coordinators from Arts & Sciences and the Provost's office, in the fall of 2013, the BA/MD Program revised its program goals, Student Learning Outcomes, and direct and indirect measures (from 2010). The goals and assessment plan which follows was first implemented in the spring of 2014.

Goal A: Students will reflect upon their learning process and experiences and identify and articulate their most effective learning strategies, as well as their strengths and weaknesses as learners.

Student Learning Outcomes: Students will be able to:

A1. Identify and evaluate areas of achievement and development as students, writers and individuals.
A2. Identify and evaluate their most effective and least effective methods and strategies of learning.

Direct measures:

1. SLO A1 is evaluated using the Learning and Study Strategies Inventory (LASSI). The LASSI measures 10 subscales: Anxiety, Attitude, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self-Testing, Study Aids, Test Strategies, and Time Management. Each of these scales is primarily related to one of three of the components of strategic learning: skill, will and self-regulation. The LASSI is administered to entering freshmen and to seniors in their final semester. Eventually, we will have a pre- and post-measure for each student and be able to monitor their growth in these learning skills between the start and end of the program.
2. SLO A2 is measured by reflective writing prompts administered in the first semester of Freshman year in HMHV 298 and compared with the same prompt administered in HMHV 398, in the second semester of the sophomore year.

Indirect measures:

1. End-of-semester and end-of-program PEAR Reports provide qualitative data. The same reflective prompt in Direct Measure #2 above will be administered in the End-of-Program evaluation.

Assessment Procedure:

In September of the fall semester of each year, the Assessment Subcommittee reviews the results of the data collected from direct and indirect measures in the last academic cycle and reports out to the CCSP at the annual academic update meeting in November.

Goal B: Students will develop and demonstrate competencies in the basic sciences and in mathematics and statistics that will prepare them for medical school and medical practice.

Student Learning Outcomes: Students will be able to:

B1. Apply basic principles from chemistry and physics to understanding living systems.
B2. Apply quantitative reasoning to describe or explain phenomena in the natural world.
B3. Apply the process of scientific inquiry to generate hypotheses, design experiments and evaluate data.

Direct measures:

1. In Year 1: SLO B3 is evaluated using student responses to their final Individual Problem Solving Assessment (IPSA) administered in BIOCHEM 423.
2. In Year 2: SLOs B1 and B2 are evaluated using student answers to diagnostic MCAT questions.
3. In Year 3: SLOs B1 and B2 are evaluated using data from the final exam in BIOCHEM 423

Indirect measures:

1. PEAR end-of-semester and end-of-program student evaluations provide qualitative data.

Assessment Procedure:

In September of the fall semester of each year, a rotating Assessment Subcommittee (with a minimum of four members) drawn from the Science & Math teaching faculty will review the direct measures applicable to the particular year in the cycle (1, 2 or 3).

For each direct measure, the overall statistics will be reported (Biochemistry final exam question, IPSA and MCAT diagnostic performance) as well as a sample of student answers drawn from the top, middle and bottom groups.

The Assessment Subcommittee reports out to the Science & Math sub-group at their meeting in October and recommendations are made to the CCSP on how to use this data for program improvement at the annual academic update meeting in November.

Discussion of Measures & Evidence:

In the first year of the cycle, SLO B3 is evaluated using student responses to their final Individual Problem Solving Assessment (IPSA) administered in BIOCHEM 423. The IPSA, a tool mirroring the process of scientific inquiry was developed at UNM to provide both opportunities for iterative practice of effective problem-solving as well as assessment (Anderson, W. L.; Sensibaugh, C. A.; Osgood, M. P.; Mitchell, S. M. 2011.). IPSAs are available to students electronically as multi-part, progressive-reveal essay exams, which are based on scientific dilemmas. Each of the five 'domains' of problem-solving are incorporated into the IPSA (Hypothesize, Investigate, Evaluate, Integrate, Reflect). Student achievement in each of the domains is evaluated by overall scores, and the assessment committee looks at examples from the top, middle and bottom thirds.

In the second year, SLOs B1 and B2 are evaluated using student answers to diagnostic MCAT questions. The Medical College Admission Test (MCAT) is a standardized, multiple-choice examination designed to assess problem solving, critical thinking, and knowledge of science concepts and principles prerequisite to the study of medicine. Scores are reported in Physical Sciences, Verbal Reasoning, and Biological Sciences. Students take a Kaplan course to prepare them for the MCAT, and are given a diagnostic test which covers application of content over the

areas of physical and biological sciences. The assessment subcommittee examines student distribution of responses to selected MCAT diagnostic questions to assess how well they are able to apply their basic science content at the end of their college level science classes.

The final year in the assessment cycle focuses on analyzing student performance on questions in the final exam in BIOCHEM 423. As the last required science class they take, and one that integrates much of their previous knowledge from biology and chemistry, this can be considered their capstone science course. Its focus on application of fundamental concepts to the natural world and non-multiple choice final exam questions make it the ideal complement to the MCAT diagnostic to enable a more detailed understanding of student thought processes.

In addition to the three year cycle of direct measures, indirect measures are obtained and discussed within the subgroup each year. PEAR end-of-semester and end-of-program student evaluations provide qualitative data on student perception of their learning in each course, both using Likert style questions and free response questions. These are discussed with individual faculty members in a meeting with the Program Director, Greg Martin, and the Basic Sciences sub-group chair, Sushilla Knottenbelt, in the semester following the evaluations. In addition annual MCAT scores provide an additional single data point on student achievement, important because students must score a certain minimum on this exam to proceed to medical school.

Because a full complement of joint-appointment faculty in the basic sciences are a relatively recent (Fall 2012) addition to the Program, and recent focus has been on pedagogical redesign, this comprehensive program assessment plan has only recently been developed. Individual faculty have focused on course assessment in the individual courses. However, the indirect measures have been regularly discussed.

The first assessment data for the direct measures is being collected and will be discussed in a meeting in October 2014.

Goal C: Students will develop and demonstrate competencies in humanities and social science research methods and written and verbal communication—with an emphasis on understanding the social determinants of health broadly as well as in the specific context of social and cultural diversity in New Mexico—that will prepare them for medical school and for medical practice.

Student Learning Outcomes: Students will be able to:

C1. Analyze, interpret, and evaluate texts and experiences related to medicine and health and communicate in written and verbal form the results.
C2. Conduct research, interpret data related to medicine and health and communicate in written and verbal form the results.
C3. Analyze, interpret and evaluate texts and data related to the social determinants of health to identify the ways differences in race, gender, class, ethnicity and culture affect health and policy.

Direct measures: SLOs C1, C2 & C3 are evaluated on a 3 year cycle, according to the following schedule:

1. In YEAR 1: SLO C1 is evaluated using a sample of six student essays drawn from HMHV 401 (the final course in the HMHV curriculum sequence). These essays employ a variety of writing strategies and modes of analysis introduced in the curriculum.
2. In YEAR 2: SLO C2 & C3 are evaluated using a sample of six student research papers drawn from the students' Summer Practicum experience (HMHV 398, 350 & 450).
3. In YEAR 3: SLO C2 & C3 are evaluated using a scoring rubric for end-of-practicum group presentations (HMHV 350 & 450).

Indirect measures:

1. PEAR end-of-semester and end-of-program student evaluations provide qualitative data.
2. MCAT scores.

Assessment Procedure:

In September of the fall semester of each year, a rotating Assessment Subcommittee (with a minimum of four members), drawn from the core HMHV teaching faculty, assesses SLOs based on sample selections from HMHV 350, 450 and 401. In October, this group reports out to the HMHV sub-group and recommendations are made to the CCSP on how to use this assessment for program improvement at the annual academic update meeting in November.

Discussion of Measures & Evidence:

In addition to the three year cycle of direct measures, indirect measures are obtained and discussed within the subgroup each year. PEAR end-of-semester and end-of-program student evaluations provide qualitative data on student perception of their learning in each course, both using Likert style questions and free response questions. These are discussed with individual faculty members in a meeting with the program director Greg Martin in the semester following the evaluations.

Because a full complement of joint-appointment faculty in the HMHV sequence is a relatively recent (Spring 2013) addition to the Program, and recent focus has been on pedagogical redesign, this comprehensive program assessment plan has only recently been developed. Individual faculty have focused on course assessment in the individual courses. However, the indirect measures have been regularly discussed.

The first assessment data for the direct measures is being collected and will be discussed in a meeting in October 2014.

3B: Provide evidence of actions taken to improve programs based on the assessment process.

The Student Progress and Eligibility Policy (SPE)

The first significant early program evolution related to assessment was to formalize a policy for what constituted "good academic standing" in the Program, and to develop a series of milestones, or release points, for poor performance in the Program's pre-medical science core. Early on, in the first three years of the Program, it became clear that a small number of students could proceed into their upper-division years, though it had become mathematically impossible for them to meet these SOM's admissions minimum standards:

1. CUMULATIVE GPA: Students must earn a cumulative GPA of at least 3.37 by graduation from the College of Arts & Sciences in the BA/MD Program.

2. PRE-MED GPA: Students must earn a GPA of a 3.00 (B average) or better in all required pre-medical core courses.

To address this problem, and also to best guide students towards successful program completion and transition to the SOM, beginning in 2009 with what is now called Phase Two, and evolving multiple times to incorporate five phases, the Program developed and instituted our SPE policy, set forth here:

Phase One:

1. All students must achieve a 2.00 cumulative grade point average (GPA) within the first academic year in the Program, which includes two regular semesters [2], all intersessions and the summer session prior to the first regular semester.
2. Upon completion of their second regular semester in the Program, students from the 2013 cohort and beyond who fail to earn a 2.00 cumulative GPA will be released from the Program.
3. Those students taking leaves-of-absence (LOA) in their first academic year will be assessed according to the number of academic semesters completed in the Program and not according to the time since admission.

Phase Two:

1. The following five pre-medicine core requirements must be completed with a GPA of 3.00 or higher within the first two academic years in the Program, which includes four regular semesters, all intersessions and the summer session between the first and second academic year. (This does *not* include the summer session following the fourth semester—the summer when most students go on Summer Practicum.)

    • Chemistry 121/123L (4 hours)
    • Chemistry 122/124L (4 hours)
    • Biology 201/201L (4 hours)

[2] Regular semesters = Fall and Spring Semesters

- Biology 202/202L (4 hours)
- Chemistry 301/303L (4 hours)

Note: The above classes and labs are required by the UNM School of Medicine. Students are currently advised to complete all five classes by the end of their third regular semester in the Program. (fall & spring semesters of the first year; summer session prior to the second year; fall semester of the second year.)

Upon the completion of their fourth regular semester in the Program students who fail to earn a GPA of 3.00 in these five courses will be released from the Program.

2. Those students taking leaves-of-absence (LOA) in their first two academic years will be assessed according to the number of academic semesters completed in the Program and not according to time since admission.
3. Students who pass SPE Phase Two, but who are behind in their major or the pre-med core due to re-taking courses may, at any time up to but not beyond reaching SPE Phase Three, petition the Student Petition Committee for additional time in the Program. These students have a maximum of ten academic semesters to complete all the requirements of the BA/MD Program.

Phase Three:

1. The following three pre-medicine core requirements must be completed with a GPA of 3.00 or higher by the end of the summer prior to the final seventh academic semester in the Program[1.].

    - Physics 151/151L (4 hours)
    - Physics 152/152L (4 hours)
    - Chem 302/304L (4 hours)

2. Students who fail to meet these criteria will be released from the Program, and their final academic year will not be paid for. These students will still be allowed to complete the HMHV major.
3. Those students taking leaves-of-absence (LOA) in their first two academic years will be assessed according to the number of academic semesters completed in the Program and not according to time since admission.

Phase Four:

1. Students must earn a score on the Medical College Admission Test (MCAT) consistent with the minimum acceptable threshold for admission into the MD program at the UNM School of Medicine in their seventh regular semester (fall semester of fourth/final undergraduate academic year).

[1.] For those who successfully petition the program for an additional time in the program, this milestone comes at the end of the summer prior to the ninth academic semester.

2. Upon completion of their eighth regular semester in the Program, students who fail to earn a score on the MCAT consistent with the minimum acceptable threshold for admission to UNM SOM will be released from the Program.

Phase Five:

1. Students must earn a 3.37 cumulative GPA within the fourth academic year, which includes eight regular semesters, all intersessions and summer sessions between all academic years.
2. The following two pre-medical core requirements must be completed with a GPA of 3.00 or higher within the fourth academic year in the Program, which includes eight regular semesters, all intersessions and summer sessions between all academic years.

    - Biology 204/204L (4 hours)
    - Biochemistry 423 (3 hours)

3. Upon completion of their eighth regular semester in the Program, students who fail to earn a cumulative GPA of 3.37 and/or a GPA of 3.00 in the BA/MD pre-medical core requirements will be released from the Program.

CCSP Eligibility & Professionalism Subgroup

As our SPE policy evolved, so too did our CCSP Eligibility & Professionalism Subgroup, comprised of faculty and staff from the College of Arts & Sciences and School of Medicine faculty, who were responsible for monitoring student progress and eligibility for the Program, as well as for adjudicating policies, regulations, standards, and procedures that apply to the BA/MD Program and its students. The CCSP Eligibility & Professionalism subgroup reviews the status of each student on a semester basis—or as needed—to determine whether or not the student is meeting the requirements for continuous eligibility. In addition, this subgroup makes decisions regarding student eligibility and student program standings in the BA/MD Program. CCSP Eligibility & Professionalism subgroup decisions affect a student's status in the Program, but has no jurisdiction over a student's status in the university as a whole.

The "Merge" Program

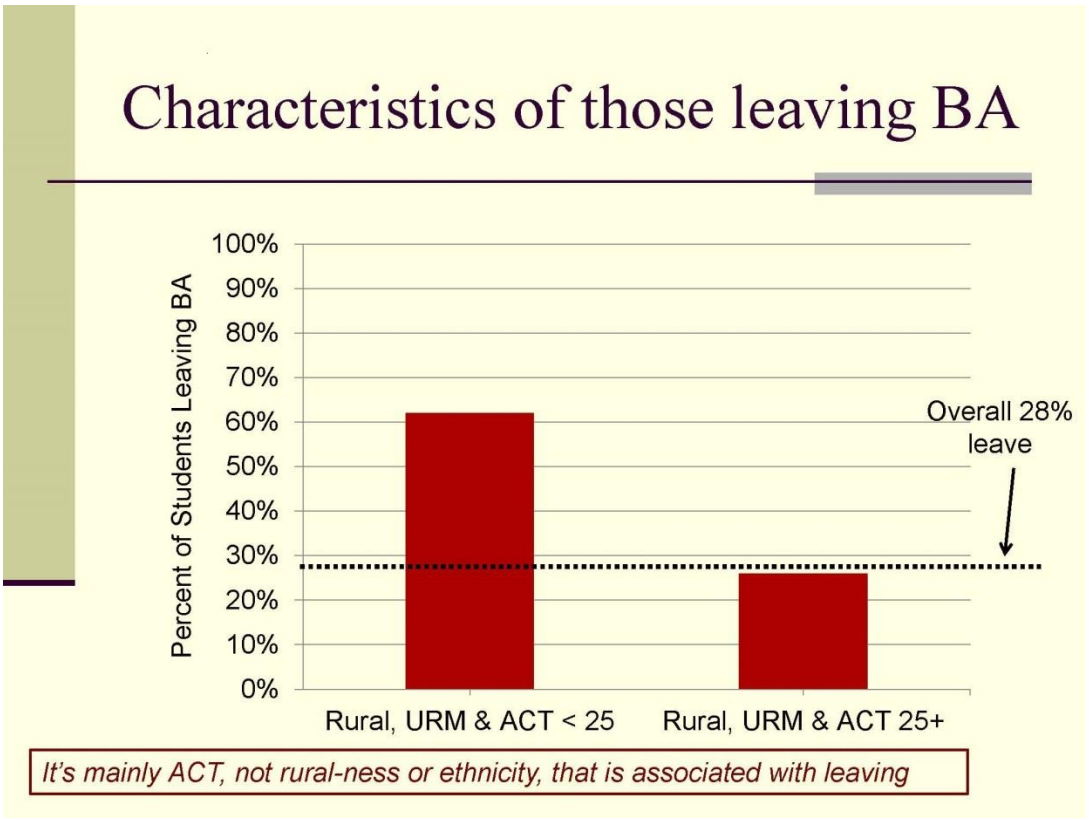
For the first time in 2011-2012, the BA/MD admitted "Merge" students into the Program to replace students who had been lost to attrition in their first two years due to change of heart or academic reasons related to the first two milestone phases of the SPE policy. To qualify for the Merge Program, students must have (1) applied to the Program before entering college and were placed on our waitlist; (2) enrolled at UNM; (3) completed the "milestone" courses of our pre-medical core in their first four semesters; and (4) had a minimum pre-medical GPA of 3.50. In 2011, 5 students were admitted into the Program. In 2012, 4 were admitted to the Program. In 2013, 5 students were admitted into the Program. Not only does the Merge Program extend opportunity to high-performing students in the general population, the Merge Program also introduces more competition, and a deeper sense of the conditional admission, or students within

the BA/MD Program, who, because of the nature of their conditional admission, and because they only have to achieve certain "minimum" requirements, by necessity do not need to be as motivated to excel as students in the regular pre-med population, for whom nothing is even conditionally guaranteed. The nature of risk and its relationship to motivation as it relates to performance and outcomes has for a number of years been a compelling, wide-ranging discussion with the administration, faculty and staff of the Program. The Merge Program is one way in which we are addressing attrition by this infusion into the junior cohort of students excelling in the required pre-medical core.

Admissions & Retention

For many years, the Program has attempted to understand why some students failed to thrive in the undergraduate program and transition to medical school. In this context, we have considered how admissions practices might relate to retention and attrition. Each year, a staff member from the PEAR Office, presents the BA/MD Student Progress Report to the BA/MD Admissions Committee and what follows is always a lively, robust conversation about the goals and mission of the BA/MD as a unique program of opportunity, as a diversity pipeline program, and as a rigorous program within UNM. Over the past four years, the PEAR office report has identified a clear correlation between students leaving the program and their performance on the ACT. Most interestingly, the data showed the following:

Figure 3B-1: Characteristics of those leaving BA



In part, as a result of the analysis of this data by experts in the PEAR office, the sharing of this data with the Admissions Committee, and other stakeholders, and rigorous conversations about its implications, incoming average ACT scores of cohorts has significantly increased over the past three years, while at the same time, maintaining diversity[3].

Figure 3B-2: BA/MD Data – Mean ACT score by cohort

Year Starting BA Program	Mean ACT Composite Score
2006	26.6
2007	26.0
2008	26.4
2009	27.4
2010	27.4
2011	27.1
2012	28.5
2013	29.3

But other factors clearly have contributed to these stronger incoming cohorts as well, including:

- More widespread awareness of the Program through recruiting and media over time
- Better prepared applicants: some students admitted to the Program reported that they had been preparing for their application since early high school and even, in some cases, middle school. And this preparation has not been limited to academic (cognitive) preparation but also non-cognitive factors, including community service, research, clinical shadowing, etc.

Faculty Hiring: a New Instructional Design for the Premedical Science Core

For the first six years of its existence, the BA/MD Program had no permanent faculty in the basic sciences. Retention data collected over these years by the SOM PEAR office was clear: our students struggled most in the pre-medical science core. Attrition was affected most by students struggling to maintain good standing with a 3.00 GPA in:

- General Chemistry I & II — Chem 121, 122
- Organic Chemistry I & II — Chem 301, 302
- Biochemistry — Biochem 423
- Molecular & Cell Biology — Bio 201
- Genetics — Bio 202
- General Physics I & II — Phys 151, 152

[3] See **Figure 4B-1:** Demographic characteristics of BA/MD students by year of entry into BA/MD program

Our students did not struggle to maintain a high GPA in their humanities and social science courses. They thrived in these courses. But approximately 1/3 of our students struggled to maintain a 3.00 in the courses in the bulleted list above. When we released students due to the SPE "milestones," it was most often due to poor performance in these courses. Yet we had no permanent faculty teaching *any* of these courses. Further, and just as problematic, we did not have anything more than the most casual relationship with the specific faculty who taught these courses. Not one faculty member teaching these courses served on our committee dedicated to curriculum, retention and attrition. Not one was part of the ongoing "brain trust" of faculty attempting to solve this conundrum. Our ambitious hiring plan of 2011-2012 solved this problem. By the beginning of the fall of 2012, the Program had hired joint appointment faculty to teach *all* of the courses above.

Also in the fall of 2012, as part of the BA/MD Program's investment in tenure track faculty and lecturers teaching all of the above courses, the Program established agreements with the different chairs in these departments so that these new joint-appointment faculty would teach the above-listed courses *with a capacity of 50* (rather than 200-300). These classes were to be filled equally with BA/MD students and traditional UNM undergraduates. These courses emphasize active and problem-based learning techniques, with a specific emphasis on pre-medicine. It is our belief, well-supported by data, that these smaller class-sizes and active-learning techniques modeled on best-practices pedagogy, lead not just to better outcomes and retention, but to deeper fundamental understanding of core concepts, which will help our students' performance later on, with the MCAT and with medical school. Lead by General Chemistry faculty member Sushilla Knottenbelt, the basic science and math faculty subgroup have developed a semester and program-long assessment of this basic science re-design. For highly promising early data on these active learning efforts please see *Appendix 2: Curricular redesign in basic science classes that form the core sequence of pre-medical classes taken by BA/MD students*.[4]

Course Design Institute

Based on on-going discussions surrounding assessment and retention (and subgroup faculty development activities), interest emerged in better understanding and incorporating active learning techniques into all BA/MD courses. The Program responded by arranging a two day Course Design Institute in January of 2013 with a faculty development expert, Dr. Gary Smith and the Office of Support for Effective Teaching. Eleven joint appointment faculty participated, from humanities, social sciences and basic sciences.

Foundations of Science (HMHV 150)

There is a statement on the PEAR semester evaluation that reads: "I was academically prepared for the coursework this semester". We noticed that this statement regularly received low marks from students in their first semester of the BA/MD Program, suggesting they felt they were not well-prepared in high school for their first semester of college. Discussion of these results led to the development of the Foundations of Science course that ran for the first time in the summer of 2013. Foundations of Science is an eight week course focusing on scientific principles and inquiry, critical reasoning, and reading comprehension. The course is required for newly

[4] This may be the most exciting document in the whole 100+ page report. Feel free to skip ahead.

admitted students who had an ACT composite score of 25 or less, and is optional for all other new admits to the BA/MD Program. Nine students took the Foundations of Science course in the summer of 2013. At the time of this report we did not have academic measures by which to evaluate its success, but students gave the course high marks in their evaluations, and said they felt more confident about starting college than they had prior to the course.

MCAT Prep

The first three classes of graduating seniors evaluated the *timing of the MCAT prep* course as poor. They were required to take the course during the fall or spring semester of their junior year, a challenging year in the BA/MD Program that generally includes chemistry, physics, and biochemistry. Using information gleaned from the evaluation, the MCAT prep course was moved to late spring/early summer immediately following the student's junior year. Comments from students since the change suggests students feel the new placement of the course is beneficial; as one student wrote: "Taking the course in the summer allowed me to focus only on MCAT prep. Therefore, I feel that the time I invested in the course was more effective."

CRITERION 4. STUDENTS (UNDERGRADUATE AND GRADUATE)

The unit should have appropriate structures in place to recruit, retain, and graduate students.

4A: Provide information regarding student recruitment and admissions (including transfer articulation).

The Program has grown in popularity every year and word of mouth remains an essential component of recruitment. High school counselors, administrator community members and students serve as some of the external recruitment resources the Program has come to appreciate. Internally the first contact individuals have is the Student Recruiters. The Program employs two Student Recruiters to cover the state of New Mexico. Duties and responsibilities of this individual include attendance at college fairs, organized school visits, career fairs and community events. Recruitment is also heavily dependent on program visits, allowing students the opportunity to visit UNMHSC and help to further solidify interest in the Program. The Student Recruiters visits all NM high schools at least once and many two to three times to share information with the student body as early as their freshmen year in high school. This individual also partners with many entities, both internal and external to UNM, to organize targeted efforts for identification of interested students.

The Program admissions process runs from August through April, with an acceptance deadline of May 1st. Students are notified of application opening date via targeted correspondence and recruitment efforts. August 15th marks the application opening date annually. Students work closely with Program staff, starting sometimes six months in advance, to ensure they will complete and submit their applications by the November 15th deadline. Upon the application deadline the Admissions Committee begins the review process for all eligible applicants (Table 4A-1).

The BA/MD Admissions Committee is a subcommittee of the School of Medicine Committee on Admissions and is co-chaired by the UNMSOM Assistant Dean of Admissions and the BA/MD Assistant Director. The committee is comprised of UNMSOM faculty, UNM staff, community members and community physicians, who volunteer their time to the selection of the new class of twenty-eight students. Each student who meets eligibility criteria is granted interviews with two committee members between the months of November and March. These members will serve as the student's advocate in full membership discussion. Students are reviewed and ranked throughout the season. Once a final list has emerged, is voted upon and approved, it is presented to the UNMSOM Committee on Admissions for final approval. Since students are provisionally admitted to the UNMSOM the UNMSOM Committee on Admissions has final approval of the Program list. Students are notified of the admissions decision in April and have until May 1st to submit their response to the admissions offer.

Table 4A-1: Admissions Requirements

Application eligibility for the Combined BA/MD Degree Program requires that a student:

- Be a New Mexico resident at time of application.
- Be a current New Mexico high school senior (high school seniors outside New Mexico who are enrolled members of the Navajo Tribe and live on the Navajo Nation are also eligible).
- Have a personal commitment to pursue a medical career in New Mexico's rural or medically underserved areas.

Minimum ACT or SAT scores

	ACT	SAT	
Math	22	≥ 510	
Reading	18		
Science	19		
English	19	≥ 450	(SAT Verbal)

Scores must be achieved prior to the application deadline. (SAT II subject test scores are not accepted.)

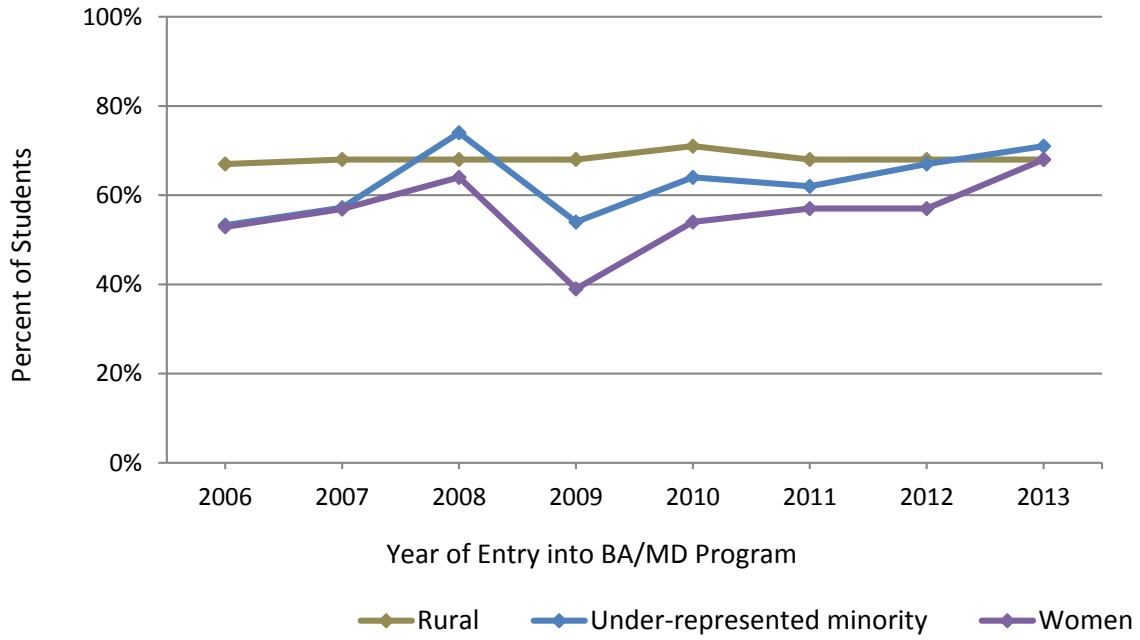
4B: Provide an analysis of enrollment trends, persistence, and graduation trends.

The BA/MD Program admitted its first group of undergraduate students in the fall of 2006. Thirty students were admitted in the inaugural year; since that time 28 students have been admitted into the Program annually. Figure 4B-1 shows demographic characteristics of the eight cohorts of BA/MD students who have matriculated to UNM. Consistently, two-thirds of BA/MD students come from rural New Mexico (outside of the Albuquerque/Rio Rancho area). The percent of students from ethic groups considered under-represented in medicine (Hispanic, Native American or African American) varies somewhat but overall is 63%. Slightly more than half of all BA/MD students are women.

Table 4B-2 shows the number of students moving into and out of the BA/MD Program by cohort year. Students leave the undergraduate portion of the BA/MD Program for several reasons: some change their minds about becoming doctors; some are unhappy living far from home; and others are unable to meet the academic requirements of BA/MD Program. Students are required to complete the undergraduate program in four years and maintain a premed GPA of 3.00 and an overall GPA of 3.37; these requirements make the BA/MD Program one of the most rigorous undergraduate programs at UNM.

We can calculate persistence for the first four matriculating classes (2006 - 2009) since the outcome (matriculation to UNM School of Medicine) is known for all students in these four classes. Persistence is defined here as the number of students who graduated from the BA/MD Program and matriculated to medical school divided by all students who entered the undergraduate program. Persistence for these first four years was 69% (82/119, or the sum of the first four rows of column 4 divided by the sum of the first four rows of column 6, Table 4B-2). The percent of students in the BA/MD Program who matriculate to medical school is lower than we would like, but is similar to that seen in the early years of other BA/MD programs that are similar to ours; see section 8A for details. As those programs evolved, the percent of students persisting in the program increased, and we are hopeful of a similar experience here at UNM. A number of changes have been made to the undergraduate program in hopes of increasing persistence. Some of these changes include the addition of merge students, reduced undergraduate class size and a change to more active teaching methods with joint-appointment faculty. See Section 3 for more details on changes made to the Program.

Figure 4B-1: Demographic characteristics of BA/MD students by year of entry



Data Source: Office of Program Evaluation, Education, and Research (PEAR), UNM School of Medicine; data are current as of November 2013

Table 4B-2: Enrollment, persistence, and matriculation to UNM School of Medicine from the BA/MD Program

Year of entry to BA/MD program	# Students Enrolled	# Merge Students added to replace students who left the program, summer of year 2	Total Students (Column 2 + Column 3)	Students leaving the program without matriculating to medical school	Students accepted to UNM medical school (Column 4 – Column 5)
2006	30	*No students added*	30	8	22
2007	28	*No students added*	28	9	19
2008	28	*No students added*	28	12	16
2009	28	5	33	8	25
2010	28	4	32	9	*To medical school 2014*
2011	28	5	33	5	*To medical school 2015*
2012	28	*To be added 2014*	28	1	*To medical school 2016*
2013	28	*To be added 2015*	28	0	*To medical school 2017*
TOTALS	**226**	**14**	**240**	**52**	**82***

** 4 students who entered the BA/MD program in 2009 were accepted into UNM School of Medicine in 2013 but asked for, and received, a 1-year deferral for their matriculation; they will begin medical school in 2014. The number of students accepted into medical school is therefore 82; 78 have matriculated to medical school.*

Data Source: Office of Program Evaluation, Education, and Research (PEAR), UNM School of Medicine; data are current as of November 2013.

4C: Provide a description of program advisement for students.

The BA/MD Program is fully committed to the success of its students. As such, an extensive support network of academic advisement and academic evaluation is in place to measure and promote positive student outcomes. The Program employs one full-time Senior Academic Advisor and one Academic Advisement Specialist; in addition, the BA/MD A&S Program Manager is a former academic advisor, holding a master's degree in counseling. The key objectives of the BA/MD advisement is to help BA/MD students successfully navigate through the university system, the Program and feel supported. The advisors provide direct assistance to the BA/MD students throughout the undergraduate portion of the BA/MD Program in such matters as course registration, academic planning and support services (including tutoring, scholarship and financial aid assistance, program support and guidance). In addition the advisors monitor student progress through the Program from start through the transition to the UNM School of Medicine. All BA/MD students are required to meet at least once each academic semester with the BA/MD advisement.

4D: Describe any student support services that are provided by the unit.

Arts & Sciences

The A&S BA/MD Program partners with the UNM Center for Academic Program Support (CAPS) to provide four distinct components of support for our students: (1) Supplemental Instruction, (2) Math & Science Tutoring Program, (3) Learning Strategies Program, and (4) Faculty Office Hours.

Of these, our primary focus is to offer Supplemental Instruction for eight academic courses within the first three years of the BA/MD curriculum of:

- Math 180: Calculus for the Life Sciences
- Chemistry 121: General Chemistry I
- Chemistry 122: General Chemistry II
- Chemistry 301: Organic Chemistry I
- Chemistry 302: Organic Chemistry II
- Biology 201L: Molecular & Cell Biology
- Biology 202L: Genetics
- Biochemistry 423: Introduction to Biochemistry

Supplemental Instruction (SI) is a series of weekly review sessions to help students succeed in historically difficult courses, specifically traditional pre-medical courses for BA/MD students. SI is for all students who want to maximize their study time, while improving both their understanding of course material and developing lifelong learning skills.

SI sessions are led by trained SI Leaders who have previously taken the course and earned a B+ or better. SI Leaders attend all class sessions to keep up with the course material and they create opportunities for students to discuss concepts, compare notes, learn key study strategies, gain a deeper understanding of the content, and network with peers.

The BA/MD Program believes that Supplemental Instruction is a strong complement to our active learning pedagogy.

School of Medicine

BA/MD students have access to the UNMSOM Office of Academic Resources and Support (OARS). The mission of OARS is to facilitate academic success through:

- Structured attention to process and content enrichment for SOM students
- Individualized academic skills development on topics including but not limited to learning strategies, study skills, test taking, time management and test anxiety
- Development, implementation, evaluation, and reporting of innovative academic interventions
- Identification, support, and facilitation of learning disabilities inquiries and requests for accommodations for all HSC students

4E: Describe any student success and retention initiatives in which the unit participates.

Foundations of Science: HMHV 150

The goals of the BA/MD Program drive recruitment of under-represented minority students from rural New Mexico, and these students are often under-prepared in the sciences. From their first day in their first required science class, these students feel unprepared and start off at a disadvantage. The science sequence proves to be a particular barrier for these students, and most of the attrition in the Program is due to failing to meet milestones in basic sciences courses. In response to this, the Program has recently developed a summer bridge course, *Foundations of Science*, required for students who do not test out of College Algebra, MATH 121, earn an ACT composite of 25 or less and recommended for students with low confidence in their science background. The course outcomes are not primarily content-based, but focus on developing scientific thinking, learning skills and the habits of mind necessary to succeed in the fast-paced basic science course requirements. In addition, an important goal was to build the self-efficacy of the students and a growth mind-set: they should come to believe that they are capable of succeeding in science with the right kind of effort and support. At the same time, the course develops collaborative learning skills and gives a perspective on the role of science in medicine. This course also employed Individual Problem Solving Assessments (IPSAs) as a tool to both build and evaluate student ability to think like a scientist. The capstone project requires students

to identify an issue of scientific interest and importance, find a peer-reviewed article that investigates it, present the hypothesis, experimental design and results as well as design a novel experiment to follow-up on the work. Summer 2013 was the first time this course was offered. Two students were required to take the class and another 7 chose to take it. Student capstone presentations were very successful, and in general, students gave positive feedback in end-of-semester surveys. However, further evaluation is in progress to determine if and how the students were (or felt) better prepared for their core science curriculum that began in fall of 2013.

4F: Describe where graduates of each program are typically placed. Describe efforts to measure the success of program graduates and the result of those measures.

The ultimate goal of the BA/MD Program is to produce doctors who will practice medicine in New Mexico; however, it takes many years to train a physician. In order to be licensed as a physician, students must complete four years of undergraduate study, four years of medical school, and another three to six years of residency training. The BA/MD Program tracks its students throughout medical school and will follow students through their residency training as well. Table 4F-1 shows student progress through medical school. As of November 2013, 78 BA/MD students have matriculated to UNM School of Medicine. Two students who matriculated into the undergraduate program in 2006 completed their undergraduate education in three years; these two students entered medical school in 2009 and graduated with medical degrees in May, 2013. They are currently in their first year of residency training; one in Family Medicine and the other in Anesthesiology. Of the remaining students who matriculated into medical school, 71 are current medical students and 5 have withdrawn from the School of Medicine.

Table 4F-1: BA/MD students in UNM School of Medicine

Year of matriculation to UNM School of Medicine	Number of students matriculating to UNM School of Medicine	UNM School of Medicine Outcomes		
		Current student in School of Medicine	Graduated from School of Medicine	Withdrew from School of Medicine
2009	2	-	2	-
2010	18	16	-	2
2011	18	17	-	1
2012	22	20	-	2
2013	18	18	-	-
TOTAL	**78**	**71**	**2**	**5**

Data Source: Office of Program Evaluation, Education, and Research (PEAR), UNM School of Medicine; data are current as of November 2013.

CRITERION 5. FACULTY

The faculty associated with the unit's programs should have appropriate qualifications and credentials. They should be of sufficient number to cover the curricular areas of each program and other research and service activities.

5A: Describe the composition of the faculty and their credentials. Provide an overall summary of the percent of time devoted to the program for each faculty member and roles and responsibilities within each program.

Of all the interdisciplinary programs in the College of Arts & Sciences, the BA/MD Program is the only one with its own joint-appointment faculty. Each of our tenure-line faculty has a tenure "home" in one of Arts & Sciences departments, but each also has a separate MOU each year outlining teaching and service commitments, related to their FTE in the Program. In addition, each tenure-track faculty member who has been hired since the Program's inception has stipulated the terms and conditions of this joint-appointment in their contractual offer letter. When program administrators, faculty and staff attend the BA/MD session at the annual AAMC conference, other BA/MD Programs speak with envy about this simple fact that our courses are taught by our own faculty, who serve on our committees. The majority of BA/MD Program students attend courses taught by faculty with no affiliation to the Program. As an interdisciplinary program in the College, we are grateful for, and keenly aware, how fortunate we are to have the financial, support and commitment from the New Mexico State Legislation and the leadership of the UNM School of Medicine.

The BA/MD Program is comprised of 19 faculty from 11 different departments, all teaching at least one semester per year for the Program, covering nearly all of the required courses in our curriculum. What follows is a breakdown of these faculty by our two principal subgroups: Science & Math and HMHV. (A table of faculty which the BA/MD supports from the School of Medicine is also included, but without CV and research bios. Once our students transition from the undergraduate degree to the SOM, they are considered regular medical students and not identified as BA/MD.)

Recent Notable Awards in Teaching

In the May of 2014, two joint-appointment faculty from the BA/MD Program won two of UNM's most prestigious teaching awards--awards given to faculty selected from across the university, including: College of Arts & Sciences, College of Fine Arts, College of Engineering, College of Education, Anderson School of Management, School of Nursing, and the School of Architecture.

- Dr. Helen Wearing won the 2013-2014 award for Outstanding Teacher of the Year--the annual award for tenured professors. Dr. Wearing holds a joint appointment in the Department of Biology, Math & Statistics, and the BA/MD Program, and she teaches *Calculus for the Life Sciences*, a course she developed for the BA/MD Program. Dr. Wearing was the first tenure track hire made by the Program, and also the first faculty member to receive tenure and promotion to Associate Professor.
- Dr. Ann Murphy won the 2013-2014 award for New Outstanding Teacher of the Year--the annual award for Assistant Professors. Dr. Murphy holds a joint appointment in the Department of Philosophy and the BA/MD Program and teaches HMHV 401: Ethics, Medicine and Health.
- Dr. Sushilla Kottenbelt won the 2012-2013 award for Outstanding Lecturer or Affiliated Faculty of the Year. Dr. Knottenbelt holds a joint appointment in the Department of

Chemistry and Chemical Biology and the BA/MD Program and teaches General Chemistry 121 & 122.

http://provost.unm.edu/2013-14-teaching-awards.html

A&S Basic Sciences & Math Faculty

Eight joint-appointment faculty teach science and math courses for the BA/MD Program. Table 5A-1 shows the qualifications, rank, courses taught and joint appointment status for these faculty.

Table 5A-1: Basic Sciences Faculty A&S

Name and degree	Rank	BA/MD responsibilities:	Joint appointment status
Kelly Howe, Ph.D.	Lecturer III	Genetics (BIO 202) each Fall semester	Biology 0.25 FTE BA/MD since Fall 2011
Christopher Johnston, Ph.D.	Assistant Professor	Cell Biology (BIO 201) each Spring semester	Biology 0.25 FTE BA/MD since Fall 2013
Sushilla Knottenbelt, Ph.D.	Lecturer III	General Chemistry I (CHEM 121) each Fall semester General Chemistry II (CHEM 122) each Spring semester	Chemistry and Chemical Biology 0.5 FTE BA/MD since Fall 2011
Mark Morgan-Tracy, Ph.D.	Lecturer III	General Physics I (PHYS 151) each Fall semester General Physics II (PHYS 152) each Spring semester	Physics 0.33 FTE BA/MD since Fall 2012
Alisha Ray, MSc	Lecturer II	Foundations of Science each Summer	Chemistry and Chemical Biology Summer PTI overload BA/MD since Summer 2013
Martina Rosenberg, Ph.D.	Assistant Professor	Introductory Biochemistry (BIOCHEM 423) each Fall and Spring semester	Biochemistry BA/MD since Fall 2012 – support provided to dept in SOM see Table 5.3
Helen Wearing, Ph.D.	Associate Professor	Elements of Calculus I (MATH 180) each Fall semester	Biology; Mathematics and Statistics 0.25 FTE BA/MD since Fall 2007
Lisa Whalen, Ph.D.	Lecturer III	Organic Chemistry I (CHEM 301) each Fall semester Organic Chemistry II (CHEM 302) each Spring semester	Chemistry and Chemical Biology 0.33 FTE BA/MD since Fall 2011

All the teaching faculty also serve on the Committee for Curriculum and Student Progress (CCSP) and on the Basic Science & Math subgroup of this committee. Sushilla Knottenbelt coordinates the sub-group. A rotating assessment committee of 4 members will serve annually to analyze the assessment data.

A&S HMHV Faculty

Eleven joint-appointment faculty teach HMHV courses for the BA/MD Program. Table 5A-2 shows the qualifications, rank, courses taught and joint appointment status.

Table 5A-2: HMHV Faculty A&S

Name and degree	Rank	BA/MD responsibilities:	Joint appointment status
Sally Bachofer, M.D.	Associate Professor	HMHV 398 (Population Health and Community Engagement) HMHV 350 & 450 (Community Service Learning)	Family & Community Medicine; Support provided to dept in SOM; BA/MD since spring 2012
Anne Baril, Ph.D.	Assistant Professor	HMHV 401 (Ethics, Medicine, and Health)	Philosophy 0.25 FTE BA/MD since Fall 2011
Kristin Barker, Ph.D.	Associate Professor	HMHV 101 (Contours of Health in New Mexico)	Sociology 0.25 FTE BA/MD since Fall 2012
Claudia Diaz Fuentes, Ph.D.	Lecturer III	HMHV 301 (Health Economics, Politics, and Policy)	Economics 0.12 FTE BA/MD since Fall 2012
Tamar Ginossar, Ph.D.	Assistant Professor	HMHV 310 (Health and Cultural Diversity)	C&J 0.25 FTE BA/MD since Fall 2011
David van der Goes, Ph.D.	Assistant Professor	HMHV 301 (Health Economics, Politics, and Policy)	Economics 0.25 FTE BA/MD since Fall 2012
Greg Martin, MFA	Professor & Director, A&S	HMHV 201 (Literature, Fine Arts, and Medicine)	English 0.75 FTE BA/MD since Fall 2007
Ann Murphy PhD	Assistant Professor	HMHV 401 (Ethics, Medicine, and Health)	Philosophy 0.25 FTE BA/MD since Spring 2013
Richard Santos, Ph.D.	Professor (former & founding Director)	HMHV 301 (Health Economics, Politics, and Policy)	Economics BA/MD since Fall 2006 - support provided to department

Name and degree	Rank	BA/MD responsibilities:	Joint appointment status
Julie Shields, Ph.D.	Assistant Professor	HMHV 310 (Health and Cultural Diversity)	C&J 0.25 FTE BA/MD since Fall 2012
Owen Whooley, Ph.D.	Assistant Professor	HMHV 101 (Contours of Health in New Mexico)	Sociology 0.25 FTE BA/MD since Fall 2012

All teaching faculty serve on the Committee for Curriculum and Student Progress (CCSP) and on the HMHV subgroup of this committee. Greg Martin coordinates the subgroup. A rotating assessment committee of four members will serve annually to analyze the assessment data.

SOM Faculty

Table 5A-3 illustrates the UNMSOM support to address the increase in size of the medical school class due to the matriculation of BA/MD students. Primary appointment for positions listed does not fall with the BA/MD Program therefore credentials are determined and tracked by the home department.

Table 5A-3: SOM Faculty

Position/Title	BA/MD %	Position/Title	BA/MD %	Position/Title	BA/MD %
Advisement	7.50%	Block Chair - Genetics/Neo	1.20%	FY11 Pathology Faculty	10.00%
Advisement	20.00%	Block Chair - Genetics/Neo	1.92%	FY11 Pathology Faculty	10.00%
Advisement	5.00%	Block Chair - Infectious	1.80%	FY11 Pathology Faculty	10.00%
Advisement	10.00%	Block Chair - Infectious	1.80%	FY11 Pathology Faculty	10.00%
Asst BA/MD Director	20.00%	Block Chair - Intro to PH	1.20%	FY11 Pathology Faculty	10.00%
BA/MD FY13 3rd Yr Clerkship - FCM	27.80%	Block Chair - Neuroscience	3.00%	FY11 Peds Acad Advisement	20.00%
BA/MD FY13 3rd Yr Clerkship - Med	10.00%	Block Chair - PIM	3.00%	FY11 PIE Faculty	18.99%
BA/MD FY13 3rd Yr Clerkship - Med	10.00%	Block Chair - PIM	3.00%	FY11 UME AcadSdntSvcOARS	50.00%
BA/MD FY13 3rd Yr Clerkship - Neuro	27.80%	Block Chair - Research	1.50%	FY11 UME AcadSdntSvcOARS	6.33%
BA/MD FY13 3rd Yr Clerkship - OB/GYN	30.89%	Block Chair - Research	1.50%	FY11 UME Multimedia Dvp Specialist	23.90%
BA/MD FY13 3rd Yr Clerkship - Peds	20.00%	Block Chair - Transition	1.85%	FY11 UME Training Specialist Staff	100.00%
BA/MD FY13 3rd Yr Clerkship - Peds	12.50%	Block Chair - Transition	1.20%	FY11 Wellness Faculty	11.49%
BA/MD FY13 3rd Yr Clerkship - Psych	20.00%	Block Chair HSF & D	6.00%	FY12 Biochem Faculty	34.66%
BA/MD FY13 3rd Yr Clerkship - Psych	9.75%	Curriculum Director, member of CCSP comm	29.00%	FY12 BIOCHEM Faculty	12.44%
BA/MD FY13 3rd Yr Clerkship - Surg	27.80%	CV/Pulm/Renal	6.00%	FY12 Pathology Faculty	10.00%
Block Chair	2.31%	Director	20.00%	FY12 Phase I Professional Coaching	36.68%
Block Chair	2.25%	Executive Director	15.00%	FY12 PIE Faculty	18.99%
Block Chair - Endocrine	1.20%	FY10 FCMed Cert of PH Fac	62.43%	FY12 Student Svcs Adv Fac	10.00%
Block Chair - Epidemiology	3.00%	FY11 Biochem Faculty	34.66%	FY12 Wellness Faculty	11.49%
Block Chair - FCP	1.50%	FY11 Cell Biology Faculty	21.92%	GI/Nutrition	3.84%
Block Chair - FCP	7.50%	FY11 Cell Biology Faculty	8.08%	HSR & Endo	1.80%
		FY11 Microbiology Faculty	23.23%	Immunology	1.80%
		FY11 Neurosciences	31.90%	Ph III Med in NM Clerkship	20.00%
				Pub Health - Phase III	20.00%
				Remediation Director	7.50%
				Research	9.00%

5B: Provide information regarding professional development activities for faculty within the unit.

All BA/MD joint appointment faculty engage regularly in two forms of professional development.

Group Instructional Feedback Technique (GIFT) evaluation

The GIFT is a means of getting student feedback on a course in the early to middle of the semester. The timing is specifically set to enable the instructor to make meaningful changes to the class within the semester. This technique prompts students to answer three questions:

- What does the instructor do that helps you learn?
- What does the instructor do that hinders your learning?
- What are some practical changes that the instructor could make to improve your learning?

Faculty are paired up and facilitate the GIFT evaluation in each other's class. The facilitator obtains a summary of the majority opinions of the class and relates this to the instructor. The facilitator and instructor then meet and discuss the student opinions with a view to improving the course for the students.

Peer-observations

Faculty are paired up and exchange syllabi and observations of each other's class. The process is three-part: there is a pre-observation meeting to discuss the goals of the particular session, describe the structure of the class and outline anything in particular that the instructor wishes to have observed. The observation follows, and a post-observation meeting wraps up the process. In this, the observation is discussed, again with the goal of course improvement.

There is an expectation that each faculty member has one GIFT evaluation and one peer-evaluation each year. General points of discussion from the GIFT evaluations and peer-observations are discussed among all the faculty in the Basic Sciences & HMHV subgroups in one of the meetings each semester. These discussions often include sharing best practices (or practices that work) and trouble-shooting.

5C: Provide a summary and examples of research/creative work of faculty members within the unit.

A&S Basic Science & Math Faculty

Dr. Kelly Howe has been a Lecturer in the UNM Biology Department since 2004 and joined the BA/MD program in 2012. Her teaching focus is Cellular/Molecular Biology and Genetics and she currently teaches the introductory Genetics course for the BA/MD Program.

Over the past year, Kelly's re-design of the introductory Genetics course has led to increased retention and overall grade improvement within the course. She incorporates a significant active learning process where students learn through a mix of instructor lecture and group problem-solving.

The course re-design is developed through participation in multiple professional development activities:

- Active Learning, Student-Centered Teaching and Departmental Change Workshop, UNM Office of Support for Effective Teaching (OSET), Fall 2013
- Expanding Your Horizons: Motivating Young Women in Science and Mathematics UNM, Spring 2013
- Course Re-Design Workshop, UNM OSET, Fall 2012
- Gateway Science and Math Course Reform, UNM OSET, Fall 2012

Dr. Christopher A. Johnston investigates the molecular mechanisms through which the axis of cell division is controlled during animal development. Positioning of the mitotic spindle is the key determinant of this process, and Dr. Johnston's research has identified several key signaling pathways involved in spindle orientation. His research lab uses a multidisciplinary approach, with techniques spanning *in vitro* protein biochemistry, structural biology, cell culture systems, and *in vivo Drosophila* genetic models. His current work focuses on mechanisms of crosstalk between the actin cytoskeleton and microtubule networks in controlling spindle orientation. Additional current research projects are investigating the coordination between cell growth/proliferation pathways with those regulating cell division orientation. Dr. Johnston is currently mentoring several students in his laboratory at both the graduate and undergraduate level, including from underrepresented minority backgrounds.

Examples of recent publications with Dr. Johnston as the corresponding author include:

- Johnston CA*, Manning L, Lu MS, Golub O, Doe CQ, and Prehoda KE*. (2013) Formin-mediated actin polymerization cooperates with Mushroom body defect (Mud)-Dynein during Frizzled-Dishevelled spindle orientation. *J. Cell Science.* 126(19):4436-44. *(*, co-corresponding authors)*
- Lu MS and Johnston CA. (2013) Molecular pathways regulating mitotic spindle orientation in animal cells. *Development.* 140(9):1843-56.

Dr. Sushilla Knottenbelt has been part of two teams supported by a UNM STEM Gateway grant to redesign General Chemistry I and II to incorporate active learning. The team designed materials to support active learning in the classroom, including pre-class quizzes, in-class application-based exercises and clicker questions. In context of her BA/MD classes, Sushilla developed general chemistry worksheets in a medical context. She has presented her redesign work at the UNM Annual Success in the Classroom conferences and the New Mexico Higher Education and Retention (NMHEAR) conferences. She has also been involved in education research on the student learning in a mid-semester intervention parachute class. This work has been presented at the Biennial Conference on Chemical Education (BCCE) as well as at the UNM Success in the Classroom Conference and at NMHEAR. In collaboration with Martina

Rosenberg and Alisha Ray, she developed the structure, pedagogy and curriculum of the new Foundations of Science class, CHEM 192. She was an invited co-facilitator and presenter of a Faculty Development workshop "Generating Solutions in Introductory-level Science Classes at NM Highlands University (Nov 16, 2013).

A list of her most relevant publications and presentations follows:

- Learning through designerly practices. Paper presented at the AERA, Philadelphia, PA., J. (2014, April 3-7). Svihla, V., Knottenbelt, S., & Buntjer, 2014
- What determines a successful parachute from General Chemistry? Oral Presentation: New Mexico Higher Education Assessment and Retention Conference 2013
- Teaching General Chemistry in a Learning Studio Classroom: switching the focus from teacher to learner. Oral Presentation: 8th Annual Success in the Classroom – Sharing Practices that Work, University of New Mexico 2013
- Active Learning in General Chemistry: The Mechanics of a Gateway Course Redesign (with Dr K. Joseph Ho), Poster Presentation: 8th Annual Success in the Classroom – Sharing Practices that Work, University of New Mexico 2013

Dr. Mark Morgan-Tracy is a lecturer in physics and astronomy at the University of New Mexico. In addition to his teaching duties, Dr. Morgan-Tracy has been chosen to lead the UNM STEM Gateway Grant's physics team. Its task has been to design an entirely new physics preparatory class that incorporates active learning. Under Dr. Morgan-Tracy's guidance, the team created the curriculum and a series of in-class worksheets designed to help students apply the mathematics encountered in a calculus-based physics course. This new course is being piloted by Dr. Morgan-Tracy this spring, and he is responsible for its in-class structure and pedagogy. In the context of his BA/MD classes, Dr. Morgan-Tracy personally developed and taught active-learning versions of general physics I and II (the first and second semesters of algebra-based physics). In his larger lecture classes, Dr. Morgan-Tracy has developed I-clicker questions and implemented Mazur's Peer-Instruction technique with the goal of increasing student participation and learning.

Examples of faculty development:

- Author or co-author of fifteen in-class worksheets for physics preparatory class.
- Author of over thirty in-class worksheets on topics from algebra-based physics I and II.
- Creator of pre-class online videos for algebra-based physics I and II.
- Instructor of three separate "flipped" classes - all taught in UNM studio classrooms.
- Creator of over 250 I-clicker questions on various algebra and calculus-based physics topics.

Alisha Ray has been a Lecturer in the UNM Department of Chemistry and Chemical Biology since 2006 and joined the BA/MD Program in 2013. She is passionate about facilitating the "demystification" of science to her students and empowering them to explore the how various chemical concepts can be used to understand and influence what goes on inside their bodies and the environment. Before going on to teach the new *Foundations of Science* course, she helped developed the course content and format along with Dr. Sushilla Knottenbelt and Dr. Martina

Rosenberg. Her normal teaching load involves using in-class activities that are followed up with clicker questions and/or short writing assignments in both *Introductory Chemistry* and *Integrated Organic and Biological Chemistry*. However she is currently teaching (and co-developing) a new course for non-science majors that focuses on the basic chemistry required to understand a variety of scientific topics in the news and affecting their community, such as global warming, acid rain, nuclear power, plastics, drugs, and genetic engineering**.**

Teaching-relevant talks and conferences:

- Laying the Foundation: Learning Scientific Thinking, Problem Solving and Strategies for the Transition to College. Oral Presentation (with Dr. Martina Rosenberg): 9th Annual Success in the Classroom – Sharing Practices that Work, University of New Mexico, 2014
- Using Clickers to Engage Students in the Classroom. Oral Presentation: 5th Annual Success in the Classroom – Sharing Practices that Work, University of New Mexico, 2010

Dr. Martina Rosenberg, PhD recently joined the Department of Biochemistry and Molecular Biology at the University of New Mexico as Assistant Professor, specializing in Biochemistry Education. Her research focuses on student learning and development of study skills through cooperative-learning groups and problem based online cases, and assessments of problem-solving skills. She is an American Society of Microbiology Research Residency (2013-2014) in Education Scholar.

- PI and Organizer of "Regional Workshop for Discipline-Based Education Researchers in NM" (Albuquerque, NM, Sept 27-29, 2013, NSF-TUES 1316636), which included an Online Journal Club in the month leading up to the event.
- Co-author of several Individual Problem Solving Assessments (IPSAs)
- Co-designer of the new course 'Foundations of Science"

Examples of faculty development:

- Invited co-facilitator and presenter: "Generating Solutions in Introductory-level Science Classes", Workshop at NM Highlands University (Nov 16, 2013)
- TED co-facilitator : Curriculum Development: Designing Learning that Lasts (Dec 4, 2012)
- Manuscript: Rosenberg, Martina J; Abel, Erika; Klausmayer, Rizalia; Osgood, Marcy P: 'Taking the Hassle out of Hasslebalch': A Teachable Unit for Undergraduates *(in preparation)*

Dr. Helen Wearing uses mathematical models to understand the biological processes that shape population and community dynamics, with a particular interest in the dynamics of infectious disease. Her current research is focused on how ecological and evolutionary processes determine the maintenance and expansion of diseases vectored by arthropods, such as mosquitoes and ticks. In collaboration with colleagues working in experimental laboratory systems, as well as with public health and entomological surveillance, her research group has been developing and testing

mathematical and computational models of dengue virus transmission. The goal is to quantify the relative importance of environmental, immunological and evolutionary pressures to gain an understanding of the effectiveness of control measures in endemic regions such as Thailand, and the potential for emergence into novel areas such as the Florida Keys. Dr. Wearing is also interested in how historical disease records can provide insights into the fundamentals of disease dynamics. Her research group recently digitized historical public health records for measles, pertussis and influenza from the United States. These records provide data over a broad spatial scale and over a significant period of time prior to the introduction of mass vaccination. Dr. Wearing and her students have been using these data to ask basic questions about disease persistence in metapopulations, as well as testing ideas about the mechanisms of waning immunity and seasonality. By taking a comparative approach, they aim to elucidate the elements that are specific to a particular disease or metapopulation.

Examples of her published work include a recent article with her graduate student Christian Gunning, another article in collaboration with the WHO-VMI Dengue Vaccine Modeling Group, and two articles that have each been cited more than 100 times:

- Gunning, C. E. & Wearing, H.J. 2013. "Probabilistic measures of persistence and extinction in measles (meta) populations" Ecology Letters 16:985-994.
- WHO-VMI Dengue Vaccine Modeling Group (Beatty, M., Boni, M.J., Brown, S., Buathong, R., Burke, D., Coudeville, L., Cummings, D.A.T., Edelman, R., Farrar, J., Focks, D.A., Gomes, M.G.M., Guignard, A., Halstead, S., Hombach, J., Knerer, G., Koelle, K., Chang Lam, F., Lang, J., Longini, I., Medlock, J., Namgyal, P., Powell, M., Recker, M., Rohani, P., Standaert, B., Struchiner, C., Teyssou, R. & Wearing H.) 2012. "Assessing the potential of a candidate dengue vaccine with mathematical modeling" PLoS Neglected Tropical Diseases 6:e1450.
- Wearing, H.J. & Rohani, P. 2006. "Ecological and immunological determinants of dengue epidemics" Proceedings of the National Academy of Sciences of the USA 103:11802-11807.
- Wearing, H.J., Rohani, P. & Keeling, M.J. 2005. "Appropriate models for the management of infectious diseases" PLoS Medicine 2:e174.

Dr. Lisa J. Whalen teaches organic chemistry to undergraduates by exploring the use of collaborative learning in both large (>50) and small (<50) courses. She is the supervisor of the undergraduate organic chemistry laboratory program, where current efforts are concentrated on building a laboratory for the 21st century and "greening" the curriculum. Secondary to teaching, she conducts research full-time in the summer. From 2006-2010, she worked in the lab of Dr. Dale Huber at the Center for Integrated Nanotechnologies on a variety of projects. Starting in 2011 she began work in Professor Lorraine Deck's lab making anticancer agents. Since 2009 she has been the faculty advisor to the American Chemical Society Student Affiliate.

Articles in refereed journals:

- Deck, L.M.; Greenberg, J.A.; Busby, T.S.; Bright, E.R.; Whalen, L.J.; Vander Jagt, D.L.; Royer, R.E. Synthesis of naphthalene and indene precursors to naphthoic and indenoic acids. *Tetrahedron Lett.* 2013, *54(45)*, 6015.

- Deck, L.M.; Mgami, Q.; Martinez, A.; Martinic, A.; Whalen, L.J.; Vander Jagt, D.L.; Royer, R.E. Synthesis of benzyl substituted naphthalenes from benzylidene tetralones. *Tetrahedron Lett*. 2012, *53(4)*, 373

Presentations:

- Whalen, L.J. Two different approaches to using collaborative learning in organic chemistry. Submitted to UNM OSET Success in the Classroom: Sharing Practices that Work. Albuquerque, NM, February 2014.
- Whalen, L.J. Impact of extracurricular review sessions on exam performance in organic chemistry. Presented at UNM OSET Success in the Classroom: Sharing Practices that Work. Albuquerque, NM, February 2011**.**

A&S HMHV Faculty

Dr. Anne Baril is a philosopher with research interests in normative ethics, applied ethics, and epistemology. Her central research program spans all three of these areas, exploring the many ways in which morality and practical reasoning are interrelated in *eudaimonia*-- the full, flourishing human life. In her present book project, Dr. Baril proposes a contemporary ethical theory in the ancient eudaimonist tradition. Building on the work of eudaimonists who argue that the exercise of the ethical virtues are an important part of human flourishing, Dr. Baril argues that the "epistemic" virtues- traits like open-mindedness, intellectual honesty, intellectual charity—are equally important, both for their own sakes, and as necessary pre-conditions of the ethical virtues. Dr. Baril also has research interests in applied ethics, for example, in exploring the nature and importance of roles (including professional roles, such as the role of 'doctor') in the ethical life, and the ethical treatment of animals. Dr. Baril regularly teaches HMHV 401: Ethics, Medicine and Health, and courses in ethics and epistemology for the philosophy department.

Recent publications include:

- "Virtue and well-being." *Routledge Companion to the Philosophy of Well-Being*, ed. Guy Fletcher. (Forthcoming)
- "Eudaimonia in Contemporary Virtue Ethics." *Handbook of Virtue Ethics*, ed. Stan van Hooft and Nicole Saunders, Acumen Press. 17-27. (2014)
- "The Role of Welfare in Eudaimonism." *Southern Journal of Philosophy* 51(4): 511-535. (2013)
- "Pragmatic Encroachment in Accounts of Epistemic Excellence." *Synthese* 190(17): 3929-3952. (2013)

Dr. Kristin Barker's research focuses on *medicalization* – the process by which ever more aspects of the human condition are defined and treated as medical in character. Her book, *The Fibromyalgia Story* (Temple University Press 2005) examines how rheumatologists created the fibromyalgia diagnosis and the concomitant experiences of women who came to be diagnosed with the contested disorder. Her current research addresses the increasingly important role of

online illness-affiliation, patient-expertise, and the pharmaceutical industry in the contemporary trend toward greater medicalization.

Examples of recent publications by Dr. Barker as the corresponding author include:

- Barker, Kristin. 2014. "Mindfulness Meditation: Do-It-Yourself Medicalization of Every Moment." *Social Science & Medicine* 106: 168-176.
- Barker, Kristin and Tasha Galardi. 2015 (Forthcoming). "Diagnostic "Diagnostic Domain Defense and the DSM-5: The Case of Autism Spectrum." *Social Problems* 62(1).
- Barker, Kristin. "Listening to Lyrica: Contested Diagnoses and Pharmaceutical Determinism." *Social Science & Medicine* 73: 833-42.

Dr. Claudia Diaz studies health disparities among older adults and immigrants. Her research focuses on the role of upstream transfers of time and financial resources on health outcomes. Her research has addressed several of the methodological constraints pertinent to multigenerational resource exchange. In particular, she has addressed the endogenous relationship between resource reallocation within the family. This allows drawing conclusions on the effects of government interventions targeting poverty through cash transfers on old-age income security and health. Her most recent work extends to the role of information asymmetry on health behaviors of high-risk groups, such as immigrant construction workers, Latinas with various levels of risk for breast cancer, and older adults with functional limitations.

Selected work:

- Águila, E., Díaz, C., Fu M.M., Kapteyn, A., & Pierson, A. Envejecer en México: condiciones de vida y salud. In L.M. Gutiérrez Robledo & D. Kershenobich Stalnikowitz (Eds.). *Envejecimiento y salud: una propuesta para un plan de acción*. Mexico City, Mexico. Universidad Nacional Autónoma de México.
- Promotoras and Hispanic Workers' Occupational Health in New Orleans. American Public Health Association. Presentation on October 30, 2012.

Dr. Tamar Ginossar is an Assistant Professor at the Department of Communication and Journalism at the University of New Mexico. As a health communication scholar, her research focuses on health information behavior in the context of health disparities, including community-based participatory methods to examine use of communication technologies for health promotion and grass-roots advocacy. Her previous research included mixed- methods examination of computer-mediated and face-to-face health information behavior of cancer patients and their families; physicians' role in participation of minority patients in cancer clinical trials; and cancer prevention information seeking of underserved patients and their families. She also applied community-based participatory research approach to examine parental help seeking in the context of early childhood development and behavioral health. She is currently funded to conduct state-wide HIV services needs assessment in New Mexico. She received a Ph.D. in health communication from the University of New Mexico, M.A. in Speech Communication from the University of Illinois, Urbana Champaign, and a B.A. in Film and Television from Tel Aviv University. Prior to her graduate studies in the U.S., she worked as a script writer.

- Ginossar, T. (2014). The Role of Stigma, Smoking, and the Tobacco Industry in Communication in Lung Internet Cancer Support Group. Accepted for publication in K. L. Walker, S. L. Esrock, & J. L. Hart (Eds.) *Talking Tobacco*: Interpersonal, Organizational, and Mediated Messages. Peter Lang Publishing.
- Ginossar, T. (2013). Promoting women leadership as a strategy for reducing health and digital disparities in Latino/a immigrant communities. In: G. L. Kreps & M. Dutta (Eds). Reducing Health Disparities: Working with Communities. Peter Lang, pp. 95-112.
- Ginossar, T. & Nelson, S. Reducing the Health and Digital Divides: A Model for Using Community-Based Participatory Research Approach to E-Health Interventions in Low-Income Hispanic Communities, *Journal of Computer Mediated Communication, 530-551; 2010* ***(lead article)***.

Gregory Martin is a literary nonfiction writer and has published two books which have each received national recognition. His first book, MOUNTAIN CITY, a memoir of a town of 33 people in remote, northeastern Nevada, received a Washington State Book Award, was named a *New York Times* Notable Book, and was featured on *NPR's Morning Edition* as one of ten "*Larger than Life Memoirs."* STORIES FOR BOYS, his second book, explores the author's relationship with his father after he came out of the closet as a gay man after 39 years of marriage to his mother. STORIES FOR BOYS was a Barnes & Noble Discover Great New Writers Selection for Holiday 2012, and the Seattle READS, one city, one book selection for 2013. Martin's essays and other literary publications have appeared in many distinguished magazines, including *The Sun, Witness, Kenyon Review Online, The Writer, Storyquarterly, Creative Nonfiction, Orion, The Seattle Times,* and many others. He is currently at work on personal essays and a longer booklength project, which combines his interest in the memoir form and the medical narrative.

Recent Publications include:

- Stories for Boys (nonfiction book) Hawthorne Books and Literary Arts. 2012
- "When Jason Collins and my father coming out will no longer matter" (Op-Ed) *The Seattle Times*, May 18, 2013
- "Elegy and the Defiance of Elegy: Longing and Writing in the American West" (preface) in BEYOND THE MYTH: New Perspectives on Western Texts, Portal Editions, London, United Kingdom; Vittoria-Gasteiz, Espana; Berkeley, CA; Buenos Aires, Argentina. 2012
- "Brittany's Choice: A ten-year-old girl refuses life-sustaining surgery" (literary journalism) *Witness: Special Issue, Disaster.* Vol: XXV No. 1, Spring 2012.
- "The Great Bewilderment" (essay) *The Sun*, March 2011

Dr. Ann V. Murphy does work in ethical theory and political philosophy on embodiment and violence. Her first monograph, *Violence and the Philosophical Imaginary* (SUNY Press Series in Gender Theory, 2012), was an examination of the way in which violent imagery and rhetoric have come to dominate philosophical discourse on the body. In contemporary Continental philosophy, violence has ascended as a particularly privileged motif in this regard. In *Violence and the Philosophical Imaginary*, the goal was to think through the prominence of images of violence in philosophical debates concerning identity, ethics, and responsibility, particularly in

the tradition of feminist philosophy. She mentors undergraduate and graduate students who are researching themes related to violence, embodiment, contemporary political philosophy, and ethics.

Recent publications include:

- *Violence and the Philosophical Imaginary*. SUNY Series in Gender Theory. 2012.
- "Reality Check: Rethinking the Ethics of Vulnerability" in *Theorizing Sexual Violence*, Eds. Victoria Grace and Renee Hemberle. Routledge Press. 2009.
- "The Concepts of Violence and Vulnerability in Recent Feminist Philosophy: Parts I & II – "Vulnerabillity" and "Violence"
- "Corporeal Vulnerability and the New Humanism" in *Hypatia: A Journal of Feminist Philosophy*. Special Issue on the Ethics of Embodiment. Eds. Debra Bergoffen and Gail Weiss. Volume 26, No.3. 2011.

Dr. Julie Delaney Shields is interested in health communication, interpersonal communication and social influence. She seeks to understand the role that parents and peers have on young adults' decisions to engage in risky behaviors such as drugs, alcohol, and sex. Dr. Shields strives to uncover why some parents and peers do not attempt to influence risky behaviors of their friends or loved ones. She also wants to understand when influence attempts are occurring, what influence techniques are being used, and which are the most effective. Her ultimate goal is to provide information that helps parents and peers overcome the obstacles they see when it comes to influencing risky behavior and to help them choose influence strategies that are effective. In her research, Dr. Shields uses quantitative and qualitative methods. She is guided by theories such as the Theory of Planned Behavior, which allows her to examine the role that attitudes, subjective norms, and perceived control play in whether or not parents and/or peers engage in risky behavior prevention.

A list of relevant publications authored in part by Dr. Shields follows:

- Burrell, N., & Delaney-Shields, J. (2014). Personal and relational repair: An overview of interpersonal conflict management. In N. Burrell, M. Allen, R. Preiss, & B. Gayle (Eds.), Managing interpersonal conflict: Advances through meta-analysis, (pp. 1-10). New York: Routledge Taylor & Francis Group.
- Roberts, F., Wilson, S.R., Delaney, J.E., & Rack, J.J. (2009). Distinguishing communication behaviors of mothers high and low in trait verbal aggression: A qualitative analysis of mother-child play-time interactions. In D. Cahn (Ed.), *Family Violence: Communication Processes* (pp. 155-178), Albany, New York: SUNY.
- Wilson, S.R., Roberts, F., Rack, J.J., & Delaney, J.E. (2008). Mothers' trait verbal aggressiveness as a predictor of maternal and child behavior during play-time interactions. *Human Communication Research*, 34, 392-422.

Dr. David van der Goes has a PhD in economics from Lehigh University with specializations in health and labor. His dissertation focused on Vietnam veterans and their families, covering the impact of active duty service on health outcomes and labor market outcomes, and effects on the children of the Vietnam War draft era.

After graduate school, Dr. van der Goes completed a 2 year postdoctoral fellowship in the School of Pharmacy at the University of Washington. He continued his training and developed skills in pharmacoeconomics and outcomes research. His work there included research on surgical quality, smoking cessation, and migraine amongst other areas.

Dr. van der Goes' interest in migraine led him to pursue research in the economics of the practice of neurology, focusing on intraoperative neurophysiological monitoring and electro-diagnostics. Dr. van der Goes has publications on these topics in *Neurology*, *Clinical Neurophysiology*, and the *Journal of Clinical Neurophysiology*. Dr. van der Goes currently has several neurology projects underway, including one funded by the American Academy of Neurology (AAN).

Dr. Owen Whooley is currently an Assistant Professor of Sociology and Senior Fellow at the Robert Wood Johnson Foundation Center for Health Policy at the University of New Mexico. His research focuses on medical professionals, specifically the history of professionalization in the United States, the nature of professional politics, and the influence of medical professions on policy outcomes. His recent book, *Knowledge in the Time of Cholera* (University of Chicago Press 2013) explores how the modern American medical profession emerged out of an intellectual crisis produced by recurrent cholera epidemics in the 19th century and the struggles over medical knowledge between medical sects that followed in their wake. Whooley offers a fresh understanding of the origins of the exceptional – and politically powerful – U.S. medical profession, one that underscores the ways in which the tension between professional authority and democratic cultural values shaped the profession. His current research focuses on the professional politics involved in the definition of mental disorders, with an emphasis on the Diagnostic and Statistical Manual of Mental Disorders (DSM). This research comprises a portion of his next book project on the history of the American psychiatric profession.

Recent Publications:

- Whooley, Owen. Forthcoming 2014. "Nosological Reflections: The Failure of DSM-5, the Emergence of RDoC, and the Decontextualization of Mental Distress," *Society and Mental Health.*
- Whooley, Owen. 2013. *Knowledge in the Time of Cholera: The Struggle over American Medicine in the Nineteenth Century*. University of Chicago Press.
- Whooley, Owen. 2010. "Diagnostic Ambivalence: Psychiatric Workarounds and the Diagnostic and Statistical Manual of Mental Disorders," *Sociology of Health & Illness,* 32(3): 452-469.

5D: Provide an abbreviated vitae (2 pages or less) or summary of experience for each faculty member (if a program has this information posted on-line, then provide links to the information).

A&S Basic Science & Math Faculty

Dr. Kelly A. Howe

Department of Biology, Castetter 65
MSC03 2020
1 University of New Mexico
Albuquerque, NM 87131
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khowe@unm.edu

EDUCATION

Ph.D. in Biology, 2004, University of New Mexico, Albuquerque, New Mexico
Dissertation title: "Two Distinct Aspects of Sexual Development in *Neurospora crassa*: Peroxisomal Function and Gene Silencing", Dissertation advisor: Dr. Mary Anne Nelson
M.S. in Biology, 1997, University of New Mexico, Albuquerque, New Mexico
Thesis title: "Characterization of the *car1* Gene of *Neurospora crassa*: A Putative Peroxisome Assembly Factor Gene", Thesis advisor: Dr. Mary Anne Nelson
B.A. in Biology, 1993, Cornell College, Mount Vernon, Iowa

APPOINTMENTS

Senior Lecturer III, University of New Mexico, Department of Biology, Spring 2012-present
Lecturer III, University of New Mexico, Department of Biology, Fall 2004-Fall 2012
Assistant Professor of Biology, University of New Mexico–Valencia Campus, Fall 2002-Spring 2004

ACHIEVEMENTS AND HONORS

BA/MD Special Lecturer University of New Mexico (2012-present)
Teaching Excellence Award Nomination in recognition of outstanding teaching, University of New Mexico Valencia Campus (Spring 2003)
Grove Academic Fellowship in recognition of outstanding graduate research, Department of Biology, University of New Mexico (1999)
Excellence in Teaching Award, Department of Biology nominee for a university-wide competition, University of New Mexico (1998)
David Perkins Scholarship Award in recognition of research on *Neurospora*, *Neurospora* Policy Committee, Nineteenth Fungal Genetics Conference (1997)

PROFESSIONAL TRAINING

Active Learning, Student-Centered Teaching and Departmental Change Workshop, UNM Office of Support for Effective Teaching (OSET), Fall 2013
Course Re-Design Workshop, UNM OSET, Fall 2012
Gateway Science and Math Course Reform, UNM OSET, Fall 2012

FULL COURSES TAUGHT (I routinely teach all of these courses)

Introductory Genetics for Majors (Biol 202)
Molecular Cell Biology for Majors (Biol 201)
Advanced Molecular Cell Biology (Biol 429)
Principles of Gene Expression (Biol 497)
Biology for Non-Majors (Bio 110/112L)
Biology for Health-Related Sciences (Bio 123/123L)

UNIVERSITY LEADERSHIP EXPERIENCE

Committee Member, BA/MD Advisory Committee, University of New Mexico (2011-present)
Committee Member, Biology Department Research Day Planning, University of New Mexico, Department of Biology (2004-present)
Committee Member, Biology Department Graduation Committee, University of New Mexico, Department of Biology (2010-1012)
Chair, Biology Department of Biology Research Day Planning, University of New Mexico, Department of Biology (2008-present)
Co-Chair, Biology Department of Biology Research Day Planning, University of New Mexico, Department of Biology (2007)
Search Committee Co-chair, Lecturer III Search Committee, University of New Mexico, Department of Biology (Spring/Summer 2006)
Search Committee Co-chair, Lecturer III Search Committee, University of New Mexico, Department of Biology (Fall 2005)
Undergraduate Advisor, University of New Mexico, Department of Biology (2004-2006)
Committee Member, Undergraduate Policy Committee, University of New Mexico, Department of Biology (2004-2005)
Search Committee Chair, Department of Biology Lecturer III Search Committee (Fall 2004)
Committee Member, Tenure and Promotion, University of New Mexico-Valencia Campus (2002-2004)
Committee Member, Faculty Development Programs, University of New Mexico-Valencia Campus (2002-2004)
Committee Member, Student Scholarships, University of New Mexico-Valencia Campus (2002-2004)
Search Committee Member, English Department Faculty Search, University of New Mexico-Valencia Campus (Spring 2004)
Search Committee Member, English Department Faculty Search, University of New Mexico-Valencia Campus (Spring & Summer 2003)
Committee Member, Graduate Student Selection Committee, Department of Biology, University of New Mexico, Spring 2001
Biology Graduate Student Association, President, University of New Mexico (1997-1998)

Christopher A. Johnston, PharmD, PhD
University of New Mexico, Department of Biology, MSC03 2020
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Education:

Purdue University	Pharmacy	PharmD – 2003
University of North Carolina, Chapel Hill	Pharmacology	PhD – 2007
University of Oregon	Molecular Biology	Postdoc – 2007-2012

Appointments:

2012- Present	Assistant Professor, Department of Biology, University of New Mexico

Honors and Awards:

2000	Merck/AACP Undergraduate Research Scholar
2001	Pfizer Undergraduate Research Scholar
2003	Merck Scholar Award
2003	Eli Lilly and Co. Achievement Award
2005	American Heart Association Graduate Research Fellow
2006	NIH Rush Kirschstein NRSA Fellow
2008	Damon Runyon Cancer Research Foundation Postdoctoral Fellowship (Dennis and Marsha Dammerman Scholar)

Publications (selected from a total of 31):

Johnston CA, Manning L, Lu MS, Golub O, Doe CQ, and Prehoda KE. (2013) Formin-mediated actin polymerization cooperates with Mud/Dynein during Frizzled/Dishevelled spindle orientation. *Journal of Cell Science.* **126(19):**4436-4444.

Lu MS and **Johnston CA**. (2013) Molecular pathways regulating mitotic spindle orientation in animal cells. *Development* **140(9):**1843-1856.

Johnston CA, Doe CQ, Prehoda KE. (2012) Structure of an enzyme-derived phosphoprotein recognition domain. *PLoS One* **7(4)**:e36014.

Wee B, **Johnston CA**, Prehoda KE, Doe CQ. (2011) Canoe binds RanGTP to promote PinsTPR/Mud-mediated spindle orientation. *Journal of Cell Biology* **195(3):**369-376.

Johnston CA, Whitney DS, Volkman BF, Doe CQ, Prehoda KE. (2011) Conversion of the enzyme guanylate kinase into a mitotic-spindle orienting protein by a single mutation that inhibits GMP-induced closing. *Proc. Nat. Acad. Sci. USA.* **108(44):**E973-978.

Ricketson D, **Johnston CA**, Prehoda KE. (2010) Multiple tail domain interactions stabilize nonmuscle myosin II bipolar filaments. *Proc. Nat. Acad. Sci. USA.* **107(49):**20964-20969.

Ségalen M, **Johnston CA**, Martin CA, Dumortier JG, Prehoda KE, David NB, Doe CQ, Bellaïche Y. (2010) The Fz-Dsh planar cell polarity pathway induces oriented cell division via Mud/NuMA in Drosophila and zebrafish. *Developmental Cell* **19(5):**740-752.

Lambert NA, **Johnston CA**, Cappell SD, Kuravi S, Kimple AJ, Willard FS, Siderovski DP. (2010) Regulators of G-protein signaling accelerate GPCR signaling kinetics and govern sensitivity solely by accelerating GTPase activity. *Proc. Nat. Acad. Sci. USA.* **107(15):**7066-7071.

Johnston CA, Hirono K, Prehoda KE, Doe CQ. (2009) Identification of an Aurora-A/PinsLINKER/Dlg spindle orientation pathway using induced cell polarity in S2 cells. *Cell* **138(6):**1150-1163.

Johnston CA, Willard MD, Kimple AJ, Siderovski DP, Willard FS. (2008) A sweet cycle for Arabidopsis G-proteins: Recent discoveries and controversies in plant G-protein signal transduction. *Plant Signaling and Behavior* **3(12):**1067-1076.

Johnston CA, Afshar K, Snyder JT, Tall GG, Gonczy P, Siderovski DP, Willard FS. (2008) Structural determinants underlying the temperature-sensitive nature of a Galpha mutant in asymmetric cell division of Caenorhabditis elegans. *J. Biol. Chem.* **283(31):**21550-21558.

Johnston CA, Willard FS, Ramer JK, Blaesius R, Roques CN, Siderovski DP. (2008) State-selective binding peptides for heterotrimeric G-protein subunits: Novel tools for investigating G-protein signaling dynamics. *Comb. Chem. High Throughput Screen* **11:**370-381.

Johnston CA, Temple BR, Chen JG, Gao Y, Moriyama EN, Jones AM, Siderovski DP, Willard FS. (2007) Comment on "A G protein coupled receptor is a plasma membrane receptor for the plant hormone abscisic acid". *Science* **318(5852):**914.

Johnston CA, Taylor PJ, Gao Y, Kimple AJ, Grigston JC, Chen JG, Siderovski DP, Jones AM, Willard FS. (2007) GTPase acceleration as the rate-limiting step in *Arabidopsis* G protein-coupled sugar signaling. *Proc. Nat. Acad. Sci. USA.* **104(44):**17317-17322.

Johnston CA and Siderovski DP. (2007) Receptor-Mediated Activation of Heterotrimeric G-proteins: Current Structural Insights. *Molecular Pharmacology* **72(2):**219-230.

Johnston CA, Lobanova E, Shavkunov A, Low J, Ramer JK, Blaesius R, Fredericks Z, Willard FS, Kuhlman B, Arshavsky V, and Siderovski DP. (2006) Minimal determinants for binding activated Gα from the structure of a Gαi1/peptide dimer. *Biochemistry* **45(38):**11390-11400.

Paing MM, **Johnston CA**, Siderovski DP, and Trejo J. (2006) Clathrin adapter AP2 regulates thrombin constitutive internalization and endothelial cell resensitization. *Mol. Cell. Biol.* **26(8):**3231-3242.

Johnston CA and Siderovski DP. (2006) Resolving G-protein coupled receptor signaling mechanics *in vivo* using fluorescent biosensors. *Cellscience* **2(3):**16-24.

Johnston CA, Ramer JK, Rainer B, Fredericks Z, Watts VJ, and Siderovski DP. (2005) A bifunctional Gαi/Gαs modulatory peptide that attenuates adenylyl cyclase activity. *FEBS Lett*ers **579(25):**5746-5750.

Johnston CA, Willard FS, Fredericks Z, Bodor ET, Jones MB, Rainer B, Harden TK, Watts VJ, Ramer JK, and Siderovski DP. (2005) Structure of Gαi1 bound to a GDP-selective peptide provides insight into guanine nucleotide exchange. *Structure* **13(7):**1069-1080.

Afshar K, Willard FS, Colombo K, **Johnston CA**, McCudden CR, Siderovski DP, and Gonczy P. (2004) Ric-8 is required for GPR-1/2-dependent Galpha function during asymmetric division of *C. elegans* embryos. *Cell* **119(2):**219-30.

Johnston CA, Beazely MA, Bilodeau ML, Andrisani O, Watts VJ. (2004) Differentiation-induced alterations in cyclic AMP signaling in the Cath.a differentiated (CAD) neuronal cell line. *J. Neurochem*. **88(6):**1497-1508.

Johnston CA, Watts VJ. (2003) Sensitization of adenylate cyclase: a general mechanism of neuroadaptation to persistent activation of Galpha(i/o)-coupled receptors? *Life Sciences* **73(23):**2913-2925.

Johnston CA, Beazely MA, Vancura AJ, Wang JT, Watts VJ. (2002) Heterologous sensitization of adenylate cyclase is protein kinase-A dependent in Cath.a differentiated (CAD)-D2L cells. *J Neurochem* **82(5):**1087-1096.

Courses taught:

BIOL 201 (Spring 2013 and 2014): Molecular and Cell Biology
BIOL 429* (Fall 2013): Advanced Molecular and Cell Biology

Sushilla Knottenbelt, D.Phil.

University of New Mexico, Department of Chemistry and Chemical Biology, MSC03 2060, 1 University of New Mexico, Albuquerque, NM 87131-0001,
505-277-3982 (Office); sknotten@unm.edu

Education

1996 – 2000	**MChem First Class (Honors) in Chemistry, Resources and the Environment,** University of York, UK.
2000 – 2003	**PhD in Computational Chemistry**, University of York, U.K.
2004 - 2007	**Postdoctoral Fellowship,** Department of Chemistry, University of New Mexico

Honors and Awards

2012	Outstanding Faculty Member: Recognized by the Accessibility Resource Center
2013	Lecturer or Affiliated Teacher of the Year at the University of New Mexico

Appointments

Fall 2011 – present: Visiting Assistant Professor at the University of New Mexico, Department of Chemistry and Chemical Biology and BA/MD Program
Fall 2009-May 2011: Part-time instructor at the University of New Mexico teaching General Chemistry 1st and 2nd semester classes.
2000-2003: Graduate Teaching Assistant, Department of Chemistry, University of York, UK.

Teaching and course design

General Chemistry I and II: Instructor and member of STEM gateway project course design team.
Foundations of Chemistry: Coordinator and implemented redesign.
Foundations of Science: Co-designer.

Conference presentations

February 2013 New Mexico Higher Education Assessment and Retention Conference, Oral Presentation: **What determines a successful parachute from General Chemistry?**

February 2013 8th Annual Success in the Classroom – Sharing Practices that Work, UNM, Oral Presentation: **Teaching General Chemistry in a Learning Studio Classroom: switching the focus from teacher to learner**. Poster Presentation: (with Dr. Joseph Ho), **Active Learning in General Chemistry: The Mechanics of a Gateway Course Redesign**

August 2012 Biennial Conference on Chemical Education (BCCE) Poster presentation: **'Can a Parachute Class prepare students to succeed?**

February 2012 7th Annual Success in the Classroom-Sharing Practices that Work, UNM and New Mexico Higher Education Assessment and Retention Conference Oral Presentation at both conferences (with Dr. Joseph Ho): **Can a Parachute Class Prepare Students to Succeed upon Returning to General Chemistry?**

Invited workshops

November 2013 'Incorporating inquiry into introductory science classes' to the New Mexico Highlands University STEM Faculty, with Drs. Vanessa Svihla and Martina Rosenberg

January 2013 'Designing Courses for Effective Student Learning' co-facilitated with Dr. Hope Garcia – led by Dr. Gary Smith

Proposals

March 2013: 2013-2014 Gateway Science and Math Course Reform Projects (member of redesign team): Develop engaging interdisciplinary exercises and resources to support active learning in the classroom in CHEM 121

March 2012: 2012-2013 Gateway Science and Math Course Reform Projects (member of redesign team): Develop engaging interdisciplinary exercises and resources to support active learning in the classroom in CHEM 122

Publications

1. Learning through designerly practices. Paper presented at the AERA, Philadelphia, PA., J. (2014, April 3-7). Svihla, V., Knottenbelt, S., & Buntjer,
2. Reaction Coordinate of Pyranopterin Molybdenum Enzymes, Encyclopedia of Inorganic Chemistry, 2009. Kirk, M. L., Knottenbelt, S., & Habtegabre, A.
3. Spectroscopic and electronic structure studies of symmetrized models for reduced members of the dimethylsulfoxide reductase enzyme family. Journal of the American Chemical Society 2008;130(14):4628-36. McNaughton R. L; Lim B. S; Knottenbelt S Z; Holm R. H; Kirk M. L.
4. Electronic structure description of the cis-MoOS unit in models for molybdenum hydroxylases. Journal of the American Chemical Society 2008;130(1):55-65. Doonan C. J; Rubie N. D; Peariso K; Harris H. H; Knottenbelt S. Z; George G. N; Young C. G; Kirk M. L
5. Terminal gold-oxo complexes. Journal of the American Chemical Society 2007;129(36):11118-33. Cao R; Anderson T. M; Piccoli P. M B; Schultz A. J; Koetzle T. F; Geletii Y. V; Slonkina E; Hedman B; Hodgson K. O; Hardcastle K. I; Fang X; Kirk M. L; Knottenbelt S. Z; Kögerler P; Musaev D. G; Morokuma K; Takahashi M; Hill C. L.
6. Catalytic mechanism of S-ribosylhomocysteinase: ionization state of active-site residues. Biochemistry 2006;45(40):12195-203.Zhu J; Knottenbelt S; Kirk M L; Pei D.
7. Paramagnetic active site models for the molybdenum-copper carbon monoxide dehydrogenase. Journal of the American Chemical Society 2006;128(7):2164-5. Gourlay C; Nielsen D. J; White J. M; Knottenbelt S Z; Kirk M L; Young C. G.
8. Understanding the origin of metal-sulfur vibrations in an oxo-molybdenum dithiolene complex: relevance to sulfite oxidase. Inorganic chemistry 2006;45(3):967-76. Inscore F. E; Knottenbelt S. Z; Rubie N. D; Joshi H. K; Kirk M. L; Enemark J. H
9. A palladium-oxo complex. Stabilization of this proposed catalytic intermediate by an encapsulating polytungstate ligand. Journal of the American Chemical Society 2005;127(34):11948-9.Anderson T. M; Cao R.; Slonkina E; Hedman B; Hodgson K. O; Hardcastle K. I; Neiwert W. A; Wu S; Kirk M. L; Knottenbelt S; Depperman E. C; Keita B; Nadjo L; Musaev D G; Morokuma K; Hill C L
10. On the electronic origins of structural isomerism in the iron-sulfur cubane, $[(C_5H_5)_4Fe_4S_4]^{2+}$. Journal of the American Chemical Society 2003;125(32):9846-52.Knottenbelt S Z; McGrady J E
11. Stable formally zerovalent and diamagnetic monovalent niobium and tantalum complexes based on diazadiene ligands. Journal of the American Chemical Society (Communication) 2002; 124(15):3818-3819. Daff P J; Etienne M; Donnadieu B; Knottenbelt S Z; McGrady J E.

Mark M. Morgan-Tracy

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Education

University of New Mexico, 1994 to 2002,
Ph.D. in Physics, December 2002 (Thesis supervisor: Carlton M. Caves)

University of Cincinnati, 1989 to 1994,
B.S. in Physics, *summa cum laude*, June 1994
B.A. in Mathematics, *summa cum laude*, June 1994

Honors and Awards

Excellence in Teaching Award, University of New Mexico Department of Physics and Astronomy, May 2012

Excellence in Teaching Award, University of New Mexico Department of Physics and Astronomy, May 2011

Chosen as favorite instructor by student and asked to appear with her in newspaper advertisement for Central New Mexico Community College's pre-engineering degree, July 2007

Teaching Experience

Lecturer III (Department of Physics and Astronomy, University of New Mexico, Aug. 2012 to present)

Responsible for teaching two sections of algebra-based physics for life-sciences majors (including active-learning sections for BA/MD students), as well as, other physics service courses. Duties include course development, assessment, lecturing, drafting and grading exams and homework.

Full-time Physics, Engineering, and Math Instructor (School of Math, Science, and Engineering, Central New Mexico Community College, Jan. 2004 to Aug. 2012)

Responsible for teaching five sections per term of various physics, engineering, and math service courses. Duties include course development, assessment, lecturing, drafting and grading exams and homework.

Part-time Lecturer (Department of Physics and Astronomy, University of New Mexico, Aug. 2010 to Aug. 2012)

Responsible for teaching various physics service courses.

Course Design

STEM Gateway Project Course Design Team Leader and Pilot Instructor for Physics 140 (University of New Mexico, summer 2013 – spring 2014): Led the team responsible for designing an active-learning preparatory course for students desiring to take calculus-based physics for engineers. The team created over fifteen new worksheets on various math topics drawn from all areas of physics that are designed to strengthen a student's math skills and prepare them for calculus-based physics.

Algebra-based Physics I (University of New Mexico, fall 2012): Designed and taught in a studio classroom an active-learning version of the first semester of algebra-based physics. I personally developed thirty-three different worksheets illustrating the topics of physics I: kinematics in one and two dimensions; Newton's laws of motion; work; conservation of energy; impulse and momentum; rigid body rotational kinematics and dynamics; equilibrium; elasticity; gravitation; fluid mechanics; simple harmonic motion; and mechanical waves.

Algebra-based Physics II (University of New Mexico, spring 2013): Designed and taught in a studio classroom an active-learning version of the second semester of algebra-based physics. I personally developed twenty-eight different worksheets illustrating the topics of physics II: Coulomb's law; electric potential; capacitance; DC current; resistance; Kirchoff's laws; Magnetic fields; Faraday's law; mutual inductance; inductors; plane waves; geometric optics; plane wave interference; diffraction; and radioactivity.

Engineering Statics (Central New Mexico Community College, summer 2006): Developed curriculum and wrote master syllabus for engineering course designed to be transferred to four-year institutions as sophomore-level statics course. Topics developed include: force vectors in two and three dimensions; moments in two and three dimensions; external and internal forces of trusses, beams, and machines; shear and moment diagrams; friction; center of mass; center of gravity; and moment of inertia.

Engineering Dynamics (Central New Mexico Community College, fall 2009): Developed curriculum and wrote master syllabus for engineering course designed to be transferred to four-year institutions as junior-level dynamics course. Topics developed include: kinematics, kinetics, energy, and momentum conservation of particles in Cartesian, normal/tangential, and cylindrical coordinate systems; general rotational motion, kinetics, work and energy, impulse and momentum of rigid bodies.

Proposals

Gateway Science and Math Course Reform Projects (Leader of design team, March 2013): Designing a new preparatory course, Physics 140, to improve retention and success in Physics 160

Invited Presentations

Fundamentals of Engineering (FE) Exam Review Session (October 2012 and March 2013): Preparing for the dynamics portion of the FE Exam. Organized by Chi Epsilon.

Alisha D. Ray, M.S.
University of New Mexico, Department of Chemistry and Chemical Biology, MSC03 2060, 1 University of New Mexico, Albuquerque, NM 87131-0001,
505-277-3094 (Office); adray@unm.edu

Education

2005	**M.S. in Chemistry**, University of New Mexico**,** Albuquerque, NM
2001	**B.S. in Anthropology and B.A. in Chemistry**, **Summa Cum Laude (Honors),** University of New Mexico**,** Albuquerque, NM

Employment History

2006-present	Lecturer II, University of New Mexico**,** Albuquerque, NM
Summer 2009	Research Assistant, University of New Mexico**,** Albuquerque, NM
Summer 2008	Research Assistant, University of New Mexico**,** Albuquerque, NM

Professional Recognition, Honors, etc.

2009-2010	Outstanding Lecturer of the Year Award, in recognition of excellent teaching and contributions towards UNM's teaching mission, OSET
2005	Clark-Person-Graham Teaching Assistant Award, in recognition of outstanding teaching, C&CB
2004	Clark-Person-Graham Teaching Assistant Award, in recognition of outstanding teaching, C&CB
2001	Outstanding Senior Award, in recognition of accomplishments in the University Honors Program, University Honors Program

Teaching and Course Design

Foundations of Science: Co-designer and Instructor
Chemistry in Our Community: Co-designer and Instructor
Introductory Chemistry: Coordinator and Instructor
Integrated Organic and Biochemistry: Instructor

Curriculum Development:

2014	Co-designed Chemistry in Our Community. The course introduces non-science majors to the basic chemistry required to understand a variety of scientific topics in the news and affecting our community, such as global warming, acid rain, nuclear power, plastics, drugs, and genetic engineering**.** In this course, students develop the critical thinking skills to assess the risks and benefits of technology-based issues. By the end of the course, students would be able to critically evaluate scientific claims as presented in the popular press.
2013	Co-designed the Foundations of Science course specifically for incoming BA/MD students. The course is designed to prepare and motivate students for a rigorous college science curriculum. The course introduces fundamental concepts in science applied to real world problems and teaches scientific thinking, problem-solving and learning tools essential for success
2010	Implemented a new online learning system, A.Le.K.S. (Assessment and Learning in Knowledge Spaces), for CHEM 111L

2009 Incorporated informal writing assignments in CHEM 212
2009 Began using video demonstrations in CHEM 111L
2008 Developed two video tutorials for unit conversions
2008 Developed and tested several group learning exercises and surveys
2008 Incorporated "capstone" project in CHEM 212 that involved writing a paper and giving a formal presentation
2008 Instituted group discussion in recitations and eliminated the use of teaching assistants as instructors in recitation
2008 Carried out an assessment of two learning outcomes for Chem 111 and each year since
2008 Incorporated several POGIL-style exercises into CHEM 212

Conferences, Invited Talks, Workshops and Meetings

2012 Talk given at ALeKS conference in Austin, TX discussing the use of ALeKS in introductory chemistry
2010 Talk and presentation given at OSET's Success in the classroom conference; *Using Clickers to Engage Students in the Classroom*, Albuquerque, NM
2008 Attended POGIL Workshop at the Joint 63rd Northwest/21st Rocky Mountain (NORM/RMRM) ACS meeting, Park City, UT
2008 Attended the New Mexico Higher Education Assessment and Retention Conference, Albuquerque, NM
2004 Poster presentation at the Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society; Logan, UT, *The role of phosphate in iron uptake and release*; Ray, Alisha D.; Watt, Richard K.

Publications:

Sylvie Pailloux, Cornel Edicome Shirima, **Alisha D. Ray**, Eileen N. Duesler, Robert T. Paine, John R. Klaehn, Michael E. McIlwain and Benjamin P. Hay; *Synthesis and Coordination Properties of Trifluoromethyl Decorated Derivatives of 2,6-Bis[(diphenylphosphinoyl)methyl]pyridine N-Oxide Ligands with Lanthanide Ions*; Inorg. Chem.*; 48 (7); pp 3104–3113; 2009.*

Pailloux, Sylvie; Shirima, Cornel Edicome; **Ray, Alisha D**.; Duesler, Eileen N.; Smith, Karen Ann; Paine, Robert T.; Klaehn, John R.; McIlwain, Michael E.; Hay, Benjamin P.; *Synthesis and lanthanide coordination chemistry of trifluoromethyl derivatives of phosphinoylmethyl pyridine N-oxides;*
Dalton Transactions; 36; 7486-7493; 2009.

Polanams, Jup.; **Ray, Alisha D**.; Watt, Richard K; *Nanophase Iron Phosphate, Iron Arsenate, Iron Vanadate, and Iron Molybdate Minerals Synthesized within the Protein Cage of Ferritin*; Inorg. Chem.; 44(9); 3203-3209; 2005.

Cutler, Chris; Bravo, Anthony; **Ray, Alisha D.**; Watt, Richard K; *Iron Loading into ferritin can be stimulated or inhibited by the presence of cations and anions: a specific role for phosphate*; J.Inorg. Biochem.; 99, 2270-2275; 2005.

Martina J. Rosenberg

Professional Preparation

Freie Universitaet Berlin	Biochemistry	B.S.	1989
Freie Universitaet Berlin	Biochemistry	M.S.	1992
Freie Universitaet Berlin	Biochemistry	Ph.D.	2000

Appointments

- Undergraduate Program Co-Director July 2013-present; Department of Biochemistry and Molecular Biology, University of New Mexico Health Sciences Center, Albuquerque, NM
- Assistant Professor, 2012-present, Department of Biochemistry and Molecular Biology, University of New Mexico, Albuquerque, NM
- Research Scientist, 2006-2012, Department of Neurosciences, University of New Mexico, Albuquerque, NM
- Research Scientist, 2000-2005 College of Pharmacy, University of New Mexico
- Research Technician, 1999-2000,Department of Pathology, University of New Mexico
- Substitute Teacher for Science, 1997-1999,Albuquerque Public School, Albuquerque, NM
- Research Assistant, 1993-1997, Institute for Experimental Oncology and Transplantation Medicine, Humboldt University, Berlin, Germany

Products

FIVE PRODUCTS MOST CLOSELY RELATED I am a new investigator and recently transitioned into the field of Discipline-based Science Education (DBER). Although I did present poster on pilot studies on this topic at national meetings, I do not have manuscripts that relate directly to the proposal

"Rethinking the undergraduate neurobiology course: a path to student centered learning"
Presentation American Society for Biochemistry and Molecular Biology (ASBMB) annual meeting, Washington, DC, (2011) Section: Classroom of the Future

Five Further Products

[1] Effect of a novel cognition–enhancing agent on fetal ethanol-induced learning deficits. Savage DD, **Rosenberg MJ**, Wolff CR, Akers KG, El-Emawy A, Staples MC, Varaschin RK, Wright CA, Seidel JL, Caldwell KK, Hamilton DA. Alcohol Clin Exp Res. 2010 Jul 9
[2] Patterns of social-experience-related c-fos and Arc expression in the frontal cortices of rats exposed to saccharin or moderate levels of ethanol during prenatal brain development. Hamilton DA, Candelaria-Cook FT, Akers KG, Rice JP, Maes LI, **Rosenberg M**, Valenzuela CF, Savage DD.Behav Brain Res. 2010 Dec 6;214(1):66-74.
[3] Effects of the cognition-enhancing agent ABT-239 on fetal ethanol-induced deficits in dentate gyrus synaptic plasticity. Varaschin RK, Akers KG, **Rosenberg MJ**, Hamilton DA, Savage DD.J Pharmacol Exp Ther. 2010 Jul;334(1):191-8.
[4] Effects of moderate drinking during pregnancy on placental gene expression. **Rosenberg MJ,** Wolff CR, El-Emawy A, Staples MC, Perrone-Bizzozero NI, Savage DD. Alcohol. 2010 Jan 4. PMID: 20053520
[5] Prenatal exposure to moderate levels of ethanol alters social behavior in adult rats: relationship to

structural plasticity and immediate early gene expression in frontal cortex. Hamilton DA, Akers KG, Rice JP, Johnson TE, Candelaria-Cook FT, Maes LI, **Rosenberg M**, Valenzuela CF, Savage DD. Behav Brain Res. 2010 Mar 5;207(2):290-304. PMID:

Synergistic Activities

• Local investigator and coordinator of "Critical Thinking Assessment Test Dissemination" (subaward originating from NSF-TUES 1022789)

• Invited co-facilitator and presenter: "Generating Solutions in Introductory-level Science Classes", Workshop at NM Highlands University (Nov 16, 2013)

• PI and Organizer "Regional Workshop for Discipline-Based Education Researchers in NM" (Albuquerque, NM, Sept 27-29,2013, NSF-TUES 1316636)

• American Society of Microbiology Research Residency in Education Scholar, (2013)

• National Academies Summer Institute on Undergraduate Education in Biology, (2013)

• Steering committee for abstract submission and review of the Society for the Advancement of Biology Education Research (SABER), 2012 http://saber-biologyeducationresearch.wikispaces.com/

• Presenter at Café Scientifique: Science outreach for high school students to encourage interest in STEM disciplines sponsored by the National Science Foundation, Albuquerque, NM, 2011 "Booze and Babies- What a brain thinks about prenatal alcohol exposure" http://cafenm.org/archive.html

• Ad hoc reviewer for Graduate Women in Science Fellowship (SDE/GWIS), 2011

• Development of Freshmen Learning Community Class "Alcohol, your Brain and Learning", (2008) and new class for seniors, "Intro to Neurobiology "(2009) at the University of New Mexico

HELEN J. WEARING

Departments of Biology and Mathematics & Statistics
University of New Mexico, Albuquerque, NM 87131
505-277-0357 (Biology Office); hwearing@unm.edu

Professional Preparation

University of Manchester, U.K. B.Sc. 1997 Mathematics and French
Heriot-Watt University, Edinburgh, U.K. M.Sc. 1998 Mathematics
Heriot-Watt University, Edinburgh, U.K. Ph.D. 2002 Mathematical Biology
University of Cambridge, U.K. Postdoctoral 2002 - 2004 Ecology
University of Georgia Postdoctoral 2004 - 2007 Epidemiology

Appointments

2007 - 2013 Assistant Professor, Departments of Biology and Mathematics & Statistics, UNM
2013 - present Associate Professor, Departments of Biology and Mathematics & Statistics, UNM

Selected Peer-Reviewed Publications

Gunning, C. E. & **Wearing, H.J.**; Probabilistic measures of persistence and extinction in measles (meta)populations; Ecology Letters; 16; 985-994; 2013.

WHO-VMI Dengue Vaccine Modeling Group (including **Wearing H.**); Assessing the potential of a candidate dengue vaccine with mathematical modeling; PLoS Neglected Tropical Diseases; 6: e1450;2012.

Nonaka, E., Ebel, G.D. & **Wearing, H.J.**; Persistence of pathogens with short infectious periods in seasonal tick populations: the relative importance of three transmission routes; PLoS ONE; 5: e11745; 2010.

Wearing, H.J. & Rohani, P.; Estimating the duration of pertussis immunity using epidemiological signatures; PLoS Pathogens; 5; e1000647; 2009.

Rohani, P., **Wearing, H.J.**, Vasco, D.A. & Huang, Y.; Understanding Host-Multipathogen Systems: Modeling the Interaction between Ecology and Immunology; Infectious Disease Ecology; Ostfeld, Keesing & Eviner; Princeton University Press; 48-70; 2008.

Wearing, H.J. & Rohani, P.; Ecological and immunological determinants of dengue epidemics; PNAS; 103; 11802-11807; 2006. Featured Faculty of 1000 Medicine.

Wearing, H.J., Rohani, P. & Keeling, M.J.; Appropriate models for the management of infectious diseases; PLoS Medicine; 2; e174; 2005.

Wearing, H.J., Rohani, P., Cameron T.C. & Sait, S.M.; The dynamical consequences of developmental
variability and demographic stochasticity for host-parasitoid interactions; American Naturalist; 164; 543-558; 2004.

Wearing, H.J. & Sherratt, J.A.; Keratinocyte growth factor signalling: a mathematical model of dermal-epidermal interaction in epidermal wound healing; Mathematical Biosciences; 165; 41-62; 2000.

Owen, M.R., Sherratt, J.A. & **Wearing, H.J.**; Lateral induction by juxtacrine signalling is a new mechanism for pattern formation; Developmental Biology; 217; 54-61; 2000.

Current Research Support

05/01/2011-04/30/2016; U01 MIDAS program NIH/NIGMS
Predicting vector-borne virus transmission dynamics and emergence potential
Role: co-PI. Total award: $3.1 million; UNM portion: $551,847.

Mentoring and Advisement of Research Projects

Undergraduate students: Sandra Baldridge (2008-09); Alexander Washburne (2008-10); Bobby Sena (2009-10); Samuel Bonin (2009-12); Zachary Gillooly (2011-12); Nathan Cournoyer (2011-12);Joseph DeAguero (2012-13); Gabriel Arrillaga (2012-13).

Masters students: Etsuko Nonaka, Applied Math, 2009 with distinction; Henry Moncada, Applied Mathematics, 2009; Stacy O'Neil Scholle, Biology, 2010; Bea Yu (co-advised), Applied Mathematics,
2010; PaulaWeber, Applied Math, 2011 with distinction.

Doctoral students: Christian Gunning, Biology, expected 2014; Etsuko Nonaka (co-advised), Biology,expected 2014; Cesar Alvarado, Applied Math, expected 2017; Larissa Anderson, Biology, expected 2018.

Postdoctoral scholars: John Hammond (co-mentor), UNM, 2011-present; Rebecca Christofferson (co-mentor), LSU, 2011-present; Michael Robert, UNM, 2013-present.

Teaching Experience and Course Design

Elements of Calculus I & II (for the Life Sciences), UNM
Co-developed sequence of two courses dedicated to freshman students from the life sciences with an emphasis on modeling biological systems, interpreting models, problem solving and reasoning skills. Created a series of worksheets for Elements of Calculus I that promotes active learning in the classroom.

Modeling Infectious DiseasesWorkshop
Co-developed lectures, in-class problem sets, Matlab programs for intensive week-long course aimed at undergraduate and graduate students from institutions across the Southwest (2012, 2014). Module for summer math camp (NSF-funded Mentoring through Critical Transition Points program) at the University of New Mexico.

Ecology and Evolution of Infectious DiseaseWorkshop
Developed or co-developed half-day modules on spectral analysis, age-structured models, simulating stochastic and deterministic disease models in the R programming language. Part of NSFfunded 4-day workshop for graduate students and research scientists at Cornell University (2010), UC Santa Barbara (2011) and University of Michigan (2012).

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Education

University of Colorado, Boulder, CO
Ph.D. Chemistry, August 2004

University of New Mexico, Albuquerque, NM
B.S. Chemistry, *summa cum laude*, July 1999

Honors and Awards

Honorary inductee, Mortar Board College Senior Honor Society, March 2013
Nominee, UNM Outstanding Adjunct Teacher/Lecturer of the Year, 2012-2013
Nominee, UNM Outstanding Adjunct Teacher/Lecturer of the Year, 2010-2011
William P. and Heather W. Weber Award for Teaching Excellence in Science, 2009-2010
UNM Outstanding Adjunct Teacher/Lecturer of the Year, 2008-2009
Skaggs Institute of Chemical Biology Postdoctoral Fellow (October 2004-May 2006).
ACS Division of Medicinal Chemistry/Bristol-Myers Squibb Predoctoral Fellow (September 2002-September 2003).
NSF Predoctoral Fellow (September 1999-September 2002).

Teaching Experience

Senior Lecturer III (University of New Mexico, May 2013-present)

Lecturer III (University of New Mexico, May 2006-present)

Responsible for teaching two sections of organic chemistry lecture or electives per semester and supervision and coordination of the undergraduate organic chemistry laboratory program.

Part-time Instructor (University of New Mexico, June 2004-August 2004)

Taught organic chemistry lecture to 90 undergraduates in summer session.

Graduate teaching assistant (University of Colorado, August 1999-May 2000)

Presentations

1. Whalen, L.J. Impact of extracurricular review sessions on exam performance in organic chemistry. Presented at UNM OSET Success in the Classroom: Sharing Practices that Work, Albuquerque, NM, February 2011.
2. Whalen, L.J.; Wong, C.-H. Targeting *E. coli* PBP1b transglycosylase. Presented at the 229th National Meeting of the American Chemical Society, San Diego, CA, March 2005; Poster ORGN 856.

3. Whalen, L.J.; Halcomb, R.L. Strategies for the synthesis of glycopeptide isosteres. Presented at the 226th National Meeting of the American Chemical Society, New York, NY, September 2003; Paper MEDI 18.
4. Whalen, L.J.; Halcomb, R.L. Strategies for the synthesis of glycopeptide isosteres. Presented at the 2003 Bristol-Myers Squibb Chemistry Award Symposium, Wallingford, CT, May 2003.
5. Whalen, L.J.; Halcomb, R.L. Strategies for the synthesis of glycopeptide isosteres. Presented at the 2002 Gordon Research Conference on Medicinal Chemistry, New London, NH, August 2002; Poster 33.
6. Whalen, L.J.; Halcomb, R.L. Strategies for the synthesis of glycopeptide isosteres. Presented at the 21st
International Carbohydrate Symposium, Cairns, Australia, July 2002; PP 185.
7. Whalen, L.J.; McEvoy, K.A.; Halcomb, R.L. Synthesis and evaluation of phosphoramidate amino acid based inhibitors of sialyltransferases. Presented at the 221st National Meeting of the American Chemical Society, San Diego, CA, April 2001; Paper ORGN 111.

Publications

1. Deck, L.M.; Greenberg, J.A.; Busby, T.S.; Bright, E.R.; Whalen, L.J.; Vander Jagt, D.L.; Royer, R.E. Synthesis of naphthalene and indene precursors to naphthoic and indenoic acids. *Tetrahedron Lett.* **2013**, *54(45)*, 6015.
2. Lenger, J.; Whalen, L.J.; Ennemann, E.C.; Schröder, M.; Wong, C.-H.; Dierks, T.; Sewald, N.; Hanson, S.R. Development and evaluation of cyclic sulfamates as activity-based probes for sulfatases. Manuscript in preparation, 2011.
3. Deck, L.M.; Mgami, Q.; Martinez, A.; Martinic, A.; Whalen, L.J.; Vander Jagt, D.L.; Royer, R.E. Synthesis of benzyl substituted naphthalenes from benzylidene tetralones. *Tetrahedron Lett*. **2012**, *53(4)*, 373.
4. Sugiyama, M.; Hong, Z.; Liang, P.-H.; Dean, S.M.; Whalen, L.J.; Greenberg, W.A.; Wong, C.-H. D-Fructose-6-phosphate aldolase-catalyzed one-pot synthesis of iminocyclitols. *J. Am. Chem. Soc.* **2007**, *129*, 14811.
5. Whalen, L.J.; Greenberg, W.A.; Mitchell, M.L.; Wong, C.-H. Iminosugar-based glycosyltransferase inhibitors. In *Iminosugars: From Synthesis to Therapeutic Applications*, Chapter 7. Compain, P. and Martin, O., Eds. Wiley VCH: Chichester, 2007; pp 153-175.
6. Yu, Z.; Sawkar, A.R.; Whalen, L.J.; Wong, C.-H.; Kelly, J.W. Isofagomine- and 2,5-anhydro-2,5-imino-D-glucitol-based glucocerebrosidase pharmacological chaperones for Gaucher disease intervention. *J. Med. Chem.* **2007**, *50*, 94.
7. Hanson, S.R.; Whalen, L.J.; Wong, C.-H. Synthesis and evaluation of general mechanism-based inhibitors of sulfatases based on (difluoromethyl)phenyl sulfate and cyclic phenyl sulfamate motifs. *Bioorg. Med. Chem.* **2006**, 14(24), 8386.
8. Sugiyama, M.; Hong, Z.; Whalen, L.J.; Greenberg, W.A.; Wong, C.-H. Borate as a phosphate ester mimic in aldolase-catalyzed reactions: practical synthesis of L-fructose and L-iminocyclitols. *Adv. Synth. Catal.* **2006**, *348*, 2555.
9. Whalen, L.J.; Wong, C.-H. Enzymes in organic synthesis: aldolase-mediated synthesis of iminocyclitols and novel heterocycles. *Aldrichimica Acta* **2006**, *39(3)*, 63.
10. Whalen, L.J.; Halcomb, R.L. Synthesis of an isostere of an *O*-linked glycopeptide. *Org. Lett.* **2004**, *6(19)*, 3221.
11. Whalen, L.J.; McEvoy, K.A.; Halcomb, R.L. Synthesis and evaluation of phosphoramidate amino acid-based inhibitors of sialyltransferases. *Bioorg. Med. Chem. Lett.* **2003**, *13(1)*, 301.
12. Whalen, L.J.; Morrow, C.J. Resolution of a chiral alcohol through lipase-catalyzed transesterification of its mixed carbonate by poly(ethylene glycol) in organic media. *Tetrahedron: Asymmetry* **2000**, *11(6)*, 1279.

A&S HMHV Faculty

ANNE BARIL

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EMPLOYMENT AND VISITING POSITIONS

University of Edinburgh, Research Visitor (March-August 2014, May-August 2012).

University of New Mexico, Assistant Professor (January 2012- present).

University of Notre Dame (U.S.), Post-Doctoral Fellow (August 2010- January 2012).

EDUCATION

University of Arizona, Ph.D. August 2010.

Dissertation: Eudaimonism in epistemology: Epistemic aspects of eudaimonia, and a eudaimonist approach in epistemology.

Committee: Julia Annas, Terry Horgan, Wayne Riggs, Mark Timmons

University of Minnesota, Twin Cities, B.A. *summa cum laude*, January 2002.

PUBLICATIONS

Papers

"Virtue and well-being." (Invited chapter in the Routledge Companion to Well-Being, ed. Guy Fletcher, forthcoming.)

"Equality, Flourishing, and the Problem of Predation." (Invited paper in a festschrift for Tom Regan, ed. Gary Comstock and Tom Regan, forthcoming.)

"Mandatory and optional roles in eudaimonist virtue ethics." (Invited paper in a special issue of the Journal of Value Inquiry, ed. Richard Hamilton, forthcoming.)

"Eudaimonia in Contemporary Virtue Ethics." *Handbook of Virtue Ethics*, ed. Stan van Hooft and Nicole Saunders, Acumen Press. 17-27. (2014)

"The Role of Welfare in Eudaimonism." *Southern Journal of Philosophy* 51(4): 511-535. (2013)

"Pragmatic Encroachment in Accounts of Epistemic Excellence." *Synthese* 190(17): 3929-3952. (2013)

"A Eudaimonist Approach to the Problem of Significance." *Acta Analytica* 25(2): 215-241. (2010)

REVIEWS

Review of *Intelligent Virtue* (Oxford University Press) by Julia Annas. *Mind* 122(485): 241-245.

Review of *Epistemic Authority: A Theory of Trust, Authority, and Autonomy of Belief* (Oxford University Press) by Linda Zagzebski. *Notre Dame Philosophical Reviews* (forthcoming).

Review of *Aristotle and the Virtues* (Oxford University Press) by Howard Curzer. *Ancient Philosophy* (forthcoming).

PRESENTATIONS

'Virtue and well-being,' to be presented at the University of Edinburgh, May 2014.

'A eudaimonist account of right action,' presented at the University of York, March 2014.

'Unifying the moral and intellectual virtues,' presented at Moral vs Intellectual Virtue Workshop, Edinburgh, March 2014.

'The role and nature of an account of right action in eudaimonism,' presented at the University of Rochester, November 2013; and University at Buffalo, February 2014.

'Moral and intellectual virtues and linguistic intuitions,' presented at Epistemology for the Rest of the World Conference, Tokyo, August 2013.

'Equality, flourishing, and the problem of predation', presented at the University of Edinburgh, May 2013.

KRISTIN KAY BARKER

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University of New Mexico
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(505) 277-5657
kbarker@unm.edu

EDUCATION

1993 Ph.D., Sociology, University of Wisconsin-Madison.
Dissertation: Birthing and Bureaucratic Women: Gender, Professionalization and the Construction of Medical Needs, 1920-1935.

Preliminary/Qualifying Examinations: Political Sociology (passed with distinction), Medical Sociology. Ph.D., Minor, History of Medicine

1987 M.S., Sociology, University of Wisconsin-Madison.

1985 B.S., Sociology and Gerontology, *summa cum laude*, Western Michigan University.

EMPLOYMENT

2012-Present	University of New Mexico, Associate Professor of Sociology.
2012-Present	Robert Wood Johnson Foundation Center for Health Policy, University of New Mexico, Senior Fellow.
2012-Present	Faculty, Combined BA/MD Program, University of New Mexico
2005- 2012	Oregon State University, Associate Professor of Sociology.
2003-2005	Oregon State University, Assistant Professor of Sociology.
1999-2003	Linfield College, Associate Professor of Sociology. Department Chair 1999-2000 and 2001-2003.
1998-1999	Reed College, Visiting Associate Professor of Sociology.
1993-1998	Linfield College, Assistant Professor of Sociology.

PUBLICATIONS

Book

2005 Barker, Kristin. *The Fibromyalgia Story: Medical Authority and Women's Worlds of Pain*. Philadelphia: Temple University Press.

Chapter One: http://www.temple.edu/tempress/chapters_1400/1685_ch1.pdf

Reviewed in: *American Journal of Sociology*, *Contemporary Sociology*, *New England Journal of Medicine*, *Social Forces*, *The Sociology of Health and Illness.*

Peer-Reviewed Articles and Book Chapters

2015 Barker, Kristin and Galardi, Tasha. "Diagnostic Domain Defense and the DSM-5: The Case of Autism Spectrum Disorder." *Social Problems* 62(1).

2014 Barker, Kristin. "Mindfulness Meditation: Do-It-Yourself Medicalization of Every Moment." *Social Science & Medicine* 106: 168-176.

2011 Barker, Kristin. "Listening to Lyrica: Contested Diagnoses and Pharmaceutical Determinism." *Social Science & Medicine* 73: 833-42.

2011 Barker, Kristin and Galardi, Tasha. "Dead by 50: Lay Expertise and Breast Cancer Screening." *Social Science & Medicine* 72: 1351-1358.

2010 Conrad, Peter and **Barker, Kristin**. "The Social Construction of Illness: Key Insights and Policy Implications." *Journal of Health and Social Behavior* 51(S):67-79.

Translated (Portuguese) and reprinted in *Idéias (A Journal of the Institute of Philosophy and Human Science).* 3(3) 2011: 183-219.

2010 Barker, Kristin. "The Social Construction of Illness: Medicalization and Contested Illness." Pp: 147-162 in Chloe Bird, Peter Conrad, Allen Fremont, and Stephan Timmermans (eds.), *The Handbook of Medical Sociology, 6th edition.* Upper Saddle River, NJ: Prentice Hall.

Edited Volumes: Books and Journals

2012 Maturo, Antonio and **Barker, Kristin** (editors). The Medicalization of Emotions and Cognition, *Salute e Società, Special Issue*. 2/Supplment (in English and Italian).

2009 Barker, Kristin and Tiedeman, Gary (editors). *Haiku for Sociologists: Seventeen Syllable Gifts for the Student of Society.* Mukilteo, WA: Basho Press.

Book Chapters, Book Reviews and Review Essays

2012 Barker, Kristin. "The Power of Pharmacueticalisation." *Salute e Società, Special Issue*. 2/Supplment: 167-172 (in English and Italian).

CLAUDIA MARÍA DÍAZ FUENTES
Economics Department
University of New Mexico
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claudiadf@unm.edu

EDUCATION

Pardee RAND Graduate School — Santa Monica, CA
PhD in Policy Analysis focus in Economics — ***Spring, 2012***

Pardee RAND Graduate School — Santa Monica, CA
MPhil in Policy Analysis — ***fall 2007***

Vanderbilt University — ***Nashville, TN***
Graduate Program in Economic Development — ***2003-2005***
M.A. Economics

Universidad Centroamericana "José Simeón Cañas" — El Salvador
B.A. Economics — ***1996-2001***

WORK EXPERIENCE

University of New Mexico
Economics Department
Position: Lecturer III
Period: August 2012 to date
Responsibilities: Professor of various economics courses (including Development Economics, Introductory and Intermediate Econometrics and History of Economic Thought). My teaching responsibilities also extend to the BA/MD program where I am responsible for one of the sections of the HMHV Health Economics course.
In addition to the teaching component, I'm also responsible for continuing independent research, as well as serving through committees. I am currently serving in the Undergraduate Committee at the Economics Department. Finally, I'm currently also serving in the Committee on Curriculum and Student Progress with the BA/MD program and the Health, Medicine and Human Values subcommittee.

University of New Mexico
Robert Wood Johnson Foundation Center
Position: Teaching Assistant for the American Economic Association Summer Program
Period: June to August 2012

PUBLICATIONS

Águila, E., **Díaz, C.,** Fu M.M., Kapteyn, A., & Pierson, A. (2012) Envejecer en México: condiciones de vida y salud. In L.M. Gutiérrez Robledo & D. Kershenobich Stalnikowitz (Eds.).

Envejecimiento y salud: una propuesta para un plan de acción. Mexico City, Mexico. Universidad Nacional Autónoma de México.

Aguila, E; **Diaz, C**; Fu M; Kapteyn,A; Pierson, A. Living Longer in Mexico: Income Security and Health. AARP-RAND-Centro Fox, 2011.

Eibner, C ; Ringel J, Kilmer B, Pacula R, **Diaz C**, Shih R. The Cost of Post-Deployment Mental Health and Cognitive Conditions in Tanielian, T., L. H. Jaycox, T. L.Schell, G. N. Marshall, and M. E. Vaiana.
Invisible Wounds of War. RAND, 2008

Diaz C. "Remesas y participación laboral" (Remittances and labor force participation) . Estudios Centroamericanos ECA No. 684, October 2005.

Diaz C., Gochez R, Lazo F, Vega L. "Análisis de coyuntura económica del segundo semestre de 2005" (Analysis of the economy in the second semester of 2005). Estudios Centroamericanos ECA No. 688-89,

TAMAR GINOSSAR, Ph.D.
University of New Mexico
Department of Communication and Journalism & The B.A./M.D. Program
ginossar@unm.edu

Educational History

Ph.D., Communication, University of New Mexico, 2002.
M. A., Speech Communication, University of Illinois, Urbana-Champaign, Spring, 1998.
B. A., Film and Television, University of Tel Aviv, 1992; Area of Emphasis: Script-Writing.

Employment History

Assistant Professor, University of New Mexico Department of Communication and Journalism, Aug. 2011- Present.
Research Assistant Professor, University of New Mexico Cancer Center, School of Medicine, Department of Internal Medicine, Division of Oncology-Hematology. December Dec. 2009-Aug. 2011.

Honors &Awards

Mentored Training for Dissemination and Implementation Research in Cancer Fellow at Washington University in St. Louis. 2014-2015. Selected as one of 14 fellows.
National Institute of Health , Early Career Reviewer. 2012- Present. Accepted for participation in the Early Career Reviewer (ECR) program at the Center for Scientific Review, National Institute of Health.
Senior Fellow, The New Mexico Center for the Advancement of Research, Engagement, & Science on Health Disparities (NM CARES HD). 2012-Present.
Interim Director, University of New Mexico Cancer Center, Community Partnerships and Health Disparities Office. September 2012-2013.
Minority-Serving Institution Faculty Scholar in Cancer Research Award. Selected as an awardee for participation in the American Association for the 2012 Cancer Research Cancer Health Disparities Conference, San Diego, CA. ($1,800).
Fellow, National Institutes of Health/Office of Behavioral and Social Sciences Research Institute on Systems Science and Health, Social Network track. Selected to attend the National Institute of Health and the Office of Behavioral and Social Sciences Research 5-day training institute on Systems Science and Health (June 10 - 15, 2012).
Minority-Serving Institution Faculty Scholar in Cancer Research Award. Selected as an awardee for participation in the American Association for Cancer Research 2012 Annual Meeting in Chicago, IL ($1,800).
Top three papers in health communication. Western States Communication Association, Albuquerque, NM.
Associated Member, University of New Mexico Cancer Center. Selected as a member in recognition of my cancer-related research achievements (July, 2011-Present).
Fellow, National Institutes of Health/Office of Behavioral and Social Sciences Research NIH Advanced Training Institute in Health Behavior Theory. Selected to attend the National Cancer Institute (NCI) and the Office of Behavioral and Social Sciences Research 7-day workshop for early career investigators (July 25 - August 1, 2010).

Articles in Refereed Journals

1. Ginossar, T., Larkey, L. How, N., & Goel, N. Coping with Women's Cancer and Perceived Providers' Support: Does Type of Cancer Make a Difference? Online Journal of Communication and Media Technologies, 2015, V,1. (accepted for publication).
2. Ginossar, T. & Nelson, S. La Comunidad Habla: Using Internet Community-Based Information Interventions to Increase Empowerment and Access to Health Care of Low-Income Latino/a Immigrants. *Communication Education,59,*3, 328 – 343; 2010.
3. Ginossar, T. & Nelson, S. Reducing the Health and Digital Divides: A Model for Using Community-Based Participatory Research Approach to E-Health Interventions in Low-Income Hispanic Communities, *Journal of Computer Mediated Communication, 530-551; 2010* ***(lead article)***.
4. Ginossar, T., De-Vargas, F., Sanchez, C., & Oetzel, J.G. "That Word, Cancer:" Breast Care Behavior of Hispanic Women in New Mexico. *Health Care for Women International* 31(1):68-87; 2010.
5. Ginossar, T. Online Participation: A Content Analysis of Differences in Utilization of Two Online Cancer Communities by Men and Women, Patients and Family Members. *Health Communication,* 23:1, 1 — 12; 2008. ***(lead article).***
6. Oetzel, J.G, De-Vargas, F., Ginossar, T., & Sanchez, C. Hispanic Women's Preferences for Breast Health Information, *Health Communication, 21:3,* 223-233; 2007. *The second authors are in alphabetical order.
7. Meares, M. M., Oetzel, J.G., Torres, A., Derkacs, D., & Ginossar, T. "Employee mistreatment and muted voices in the Culturally Diverse Workplace." *Journal of Applied Communication, 32 (1)4-27; 2004.*
8. Oetzel, J.G., Torres, A. B., Meares, M.M., Ginossar, T., & Derkacs, D. "Mistreatment as a source of intergroup conflict in the culturally diverse organization." *Journal of Intergroup Relations, 29*(4), 44-63; 2003.

Articles Appearing in Chapters in Edited Volumes

1. Ginossar, T. (2014). The Role of Stigma, Smoking, and the Tobacco Industry in Communication in Lung Internet Cancer Support Group. Accepted for publication in K. L. Walker, S. L. Esrock, & J. L. Hart (Eds.) *Talking Tobacco*: Interpersonal, Organizational, and Mediated Messages. Peter Lang Publishing.
2. Ginossar, T. (2013). Promoting women leadership as a strategy for reducing health and digital disparities in Latino/a immigrant communities. In: G. L. Kreps & M. Dutta (Eds). Reducing Health Disparities: Working with Communities. Peter Lang, pp. 95-112.
3. Ginossar, T. Bridging the health and digital divide in a low Income Hispanic community: Using community-based participatory research to advance communities' well-being. In: M. Brann (Ed.). *Contemporary case studies in health communication: Theoretical and applied approaches.* Kendal Hunt; Dubuque, IA; 2011.
4. Ginossar, T. Media Globalization and "The Secondary Flow": Consumption of Telenovelas in Israel. In: D. I. Rios & M. Castaneda (Eds.). *Soap Operas and Telenovelas in the Digital Age: Global Industries, Hybrid Content, and New Audiences* (pp.55-74); Peter Lang; New York; 2011.
5. Ginossar, T. Content, Participants, and Dynamics in Online Discussion in a Lung Internet Cancer Support Group: A Case Study. In: L. Shedletsky & J. E. Aitken *(Eds). Cases on Online Discussion and Interaction: Experiences and Outcomes (pp.302-318). IGI Global;* 2011.

Gregory Martin

Combined BA/MD Degree Program
MSC09 5065
1 University of New Mexico
Albuquerque, New Mexico 87131

Department of English
MSC03 2170
1 University of New Mexico
Albuquerque, NM 87131

Education

M.F.A. **Creative Writing**, *Creative Nonfiction*, December 1997
The University of Arizona, Tucson, Arizona

B.A. **Philosophy**, *High Honors*, *Philosophy Honors Program*, May 1993
The University of Virginia, Charlottesville, Virginia

Academic & Administrative Positions

Director, Combined BA/MD Degree Program
College of Arts and Sciences
The University of New Mexico, Albuquerque, New Mexico
July 2011 – Present

Associate Director, Combined BA/MD Degree Program
College of Arts and Sciences
The University of New Mexico, Albuquerque, New Mexico
January 2010 – June 2011

Professor, Department of English
The University of New Mexico, Albuquerque, New Mexico
August 2014 – Present

Associate Professor, Department of English
The University of New Mexico, Albuquerque, New Mexico
August 2007 – July2014

Assistant Professor, Department of English
The University of New Mexico, Albuquerque, New Mexico
August 2001 – July 2007

University and Departmental Recognition & Honors

Wertheim Award
University of New Mexico English Department May 2013
$3000 *Award for tenured faculty who has made outstanding contributions to the profession.*

Outstanding Teacher of the Year
University of New Mexico May 2008
$1500 Award Given to Two Professors selected from The College of Arts & Sciences, The College of Fine Arts, The College of Engineering, The College of Education, The Anderson School of Management, The School of Nursing, and the School of Architecture.
Gunter Starkey Teaching Award
University of New Mexico College of Arts & Sciences May 2007
$2000 Award Given to 3 Professors in the College of Arts and Sciences
Keleher Award for Outstanding Assistant Professor
University of New Mexico English Department May 2003
$1000 Award Given to an Assistant Professor of English

Literary Recognition & Honors

Seattle Reads 2013: STORIES FOR BOYS
Barnes & Noble Discover Great New Writers Selection, Holiday 2012: STORIES FOR BOYS
Pacific Northwest Independent Bestseller's List: STORIES FOR BOYS
Feature & Interview on the PBS Nationally Syndicated Show: *Well Read*

Recognition for MOUNTAIN CITY
Federal Assistance Award: The U.S. Embassy Speaker Series, Madrid, Spain, 2010
Silver Pen Award, Nevada Writer's Hall of Fame *University of Nevada, Reno*, 2002
Washington State Book Award: MOUNTAIN CITY 2012
NPR's Morning Edition: Ten Larger-Than-Life Memoirs August, 1, 2005
New York Times Notable Book of the Year, 2000

Books

Stories for Boys (nonfiction) Hawthorne Books and Literary Arts. 2012
Mountain City (nonfiction) North Point Press, a division of Farrar, Straus, and Giroux. 2000
Mountain City (Spanish translation) Debate. 2000

Essays & Other Publications

"When Jason Collins and my father coming out will no longer matter" (Op-Ed) *The Seattle Times*, May 18, 2013
"Elegy and the Defiance of Elegy: Longing and Writing in the American West" (preface) in BEYOND THE MYTH: New Perspectives on Western Texts, Portal Editions, London, United Kingdom. 2012
"Brittany's Choice: A ten-year-old girl refuses life-sustaining surgery" (literary journalism) *Witness: Special Issue, Disaster.* Vol: XXV No. 1, Spring 2012.
"The Great Bewilderment" (essay) *The Sun*, March 2011
"A Memoir is a Reckoning" (craft essay) *The Writer*, September 2010
"Two True Stories About Breathing" (essay) *Kenyon Review Online*, August 2010
"The Family Plot" (essay) *The Sun*, October 2008
"Hugh Brody's The Other Side of Eden " (review) *Orion*, Winter 2002
"Cutting the Snow" (essay) *Creative Nonfiction*, Spring 2000
"Macular Degeneration" (essay) *North Dakota Quarterly*, Fall 1999

Ann V. Murphy

Department of Philosophy
1 University of New Mexico MSC 03-2140
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avmurphy@unm.edu

APPOINTMENTS

- January 2013-Present. Assistant Professor of Philosophy. University of New Mexico. Albuquerque, NM.
- June–December 2012. Associate Professor of Philosophy (with tenure). Fordham University.
- 2006- 2012. Assistant Professor of Philosophy. Fordham University. Bronx, NY.
- 2003-2006. New South Global Postdoctoral Fellow. School of Philosophy. University of New South Wales. Sydney, Australia.
- 2002-2003. Visiting Assistant Professor. Mount Holyoke College. South Hadley, MA.

EDUCATION

- Ph.D. Philosophy. University of Memphis. Memphis, TN. 2002.
- B.A. Philosophy. Grinnell College. Grinnell, IA. 1996.

AWARDS & GRANTS

- University of New Mexico New Teacher of the Year Award 2013-2014
- Fordham University Faculty Research Fellowship. 2009-2010.
- Fordham University Research Grant. Summer 2009.
- Graduate Student Meritorious Teaching Award. University of Memphis, March 2002.
- Hillary Johnson Memorial Graduate Student Teaching Award. University of Memphis, February 2002.

PUBLICATIONS

Book

Violence and the Philosophical Imaginary. SUNY Series in Gender Theory. 2012. (Reviewed in Hypatia Reviews Online, The APA Newsletter on Feminism and Philosophy, The Journal of French and Francophone Philosophy. Subject of a book panel organized by the Society for Women in Philosophy at the American Philosophical Association Pacific Division Meeting in April 2013, a workshop at the University of Bergen-Norway in June 2013.)

Journal Articles & Book Chapters

- "The Traffic in Women Revisited." Review Essay on Debra Bergoffen's *Contesting the Politics of Genocidal Rape: Affirming the Dignity of the Vulnerable Body* for *Philosophy Today* Forthcoming 2015.

- "The Concepts of Violence and Vulnerability in Recent Feminist Philosophy: Part II – Vulnerability." *Philosophy Compass*. Forthcoming.
- "The Concepts of Violence and Vulnerability in Recent Feminist Philosophy: Part I - Violence" *Philosophy Compass*. Forthcoming.
- "Corporeal Vulnerability and the New Humanism" in *Hypatia: A Journal of Feminist Philosophy*. Special Issue on the Ethics of Embodiment. Eds. Debra Bergoffen and Gail Weiss. Volume 26, No.3. 2011.
- "'Violence is Not an Evil:' Ambiguity and Violence in Simone de Beauvoir's Early Philosophical Writings" in *philoSOPHIA: a journal of continental feminism*. Volume 1, no.1. 2010.
- "'All Things Considered:' Sensibility and Ethics in the Later Merleau-Ponty and Derrida" in *Continental Philosophy Review*. Volume 42. No. 4. 2010.
- "The Remainder: Between Symbolic and Material Violence" in *Philosophy and the Return of Violence: Studies from this Widening Gyre.* Eds. Christopher Yates and Nathan Eckstrand. Continuum Press. 2011.
- "Ambiguity and Precarious Life: Tracing Beauvoir's Legacy in the Work of Judith Butler" in *Beauvoir and the History of Philosophy from Plato to Butler.* Eds. Shannon Mussett and William Wilkerson. SUNY Press. 2012.
- "Apology and Forgiveness," for *A Companion to Derrida*. Eds. Leonard Lawlor and Zeynep Direk. Blackwell. Forthcoming.
- "Critique, Power and Ontological Violence" in *Between Levinas and Heidegger*. Eds. John Drabinski and Eric Nelson. Albany: SUNY Press. Forthcoming.
- "Reality Check: Rethinking the Ethics of Vulnerability" in *Theorizing Sexual Violence*, Eds. Victoria Grace and Renee Hemberle. Routledge Press. 2009.
- "Feminism and Race Theory" in *Merleau-Ponty: Basic Concepts*. Eds. Rosalyn Diprose and Jack Reynolds. Acumen Press, 2008.
- "Sexuality" in *The Blackwell Companion to Phenomenology and Existentialism*. Eds. Mark Wrathall and Herbert Dreyfus. Blackwell. 2007.
- "Beyond Performativity and Against Identification: Gender and Technology in Irigaray" in *Returning to Irigaray*, Eds. Maria Cimitile and Elaine Miller. SUNY Press. SUNY Series in Gender Theory, 2007.
- "Language in the Flesh: The Politics of Discourse in Merleau-Ponty, Levinas, and Irigaray" in *Feminist Interpretations of Merleau-Ponty*. Eds. Dorothea Olkowski and Gail Weiss. Penn State Press, 2006.
- "Between Generosity and Violence: Towards a Revolutionary Politics in the Philosophy of Simone de Beauvoir" in *The Philosophy of Simone de Beauvoir*. Ed. Margaret Simons. Indiana University Press. 2006.
- "The Political Significance of Shame" *Borderlands: New Spaces in the Humanities*. Special Issue on Unassumable Responsibility, ed. C. Mills and F. Jenkins. Volume 3, No. 1. 2004

Julie Delaney Shields

Education

Ph.D.	Purdue University December 2009 Major: Social Influence/Persuasion Minor: Interpersonal Communication Minor: Quantitative & Qualitative Methods
M.A.	The University of Texas at Austin May 2004 Major: Social Influence/Persuasion
B.S.	The University of Texas at Austin May 2002 Major: Organizational Communication

Academic Appointments

Assistant Professor, University of New Mexico, Fall 2012 – present
Department of Communication & Journalism and BA/MD Program
Assistant Professor, University of Wisconsin-Milwaukee, Spring 2010-Summer 2012

Research Appointments

Center for Addiction and Behavioral Health Research (CABHR) Center Scientist, University of Wisconsin - Milwaukee, 2010-2012
Graduate Research Assistant, Purdue University, Spring 2005

Publications

Burrell, N., & Delaney-Shields, J. (2014). Personal and relational repair: An overview of interpersonal conflict management. In N. Burrell, M. Allen, R. Preiss, & B. Gayle (Eds.), Managing interpersonal conflict: Advances through meta-analysis, (pp. 1-10). New York: Routledge Taylor & Francis Group.

Roberts, F., Wilson, S.R., Delaney, J.E., & Rack, J.J. (2009). Distinguishing communication behaviors of mothers high and low in trait verbal aggression: A qualitative analysis of mother-child play-time interactions. In D. Cahn (Ed.), *Family Violence: Communication Processes* (pp. 155-178), Albany, New York: SUNY.

Wilson, S.R., Roberts, F., Rack, J.J., & Delaney, J.E. (2008). Mothers' trait verbal aggressiveness as a predictor of maternal and child behavior during play-time interactions. *Human Communication Research*, 34, 392-422.

David Noel van der Goes

Department of Economics
University of New Mexico
1915 Roma Ave. NE, 1019
1 University of New Mexico
Albuquerque, NM 87131
Email: dvandergoes@unm.edu
Homepage: http//econ.unm.edu/contacts/faculty-profiles/david-van-der-goes.html

Current Position

[2012 - present]University of New Mexico
Assistant Professor of Economics
Assistant Professor, Combined BA/MD Program
Senior Fellow, RWJF Center for Health Policy

Education & Training

- [2012]PORPP-Pfizer Postdoctoral Fellowship, Pharmaceutical Outcomes Research & Policy Program, University of Washington, Advisors: Louis P. Garrison (UW), Richard J. Willke (Pfizer)
- [2010] Ph.D. Economics, Lehigh University
  Thesis: *Three Essays on the Vietnam War and the Draft* - Stout Dissertation Award Winner, Co-Chairs: Shin-Yi Chou, Stephen Snyder
- [2004] B.A. Economics, summa cum laude, Temple University

Publications

- David van der Goes, Justin Wang, and Kathy Wolchik "Effect of State Health Mandates on Employer-Provided Health Insurance," *Eastern Economic Journal,* 2011, 37, (437--449).
- John P. Ney, David van der Goes, and Jon Watanabe "Economic Decision Model for Multimodal Intraoperative Neurophysiologic Monitoring in High Risk Spinal Surgeries" (forthcoming in *Clinical Neurophysiology*).
- David van der Goes and Stephen Snyder "From the Vietnam War to Retirement: Are Veterans Healthy Enough to Enjoy Their `Golden Years'?" (forthcoming in *Journal of Military & Veterans Health*).
- John P. Ney, David van der Goes, and Jon Watanabe "Cost-Benefit Analysis: Intraoperative Neurophysiologic Monitoring in High Risk Spinal Surgeries" (forthcoming in *Journal of Clinical Neurophysiology*).

Professional Experience

- Pfizer Inc. Global Health Economics & Outcomes Research, Primary Care Business Unit; New York City, NY; Summer 2011.
- VeriTech Corporation; Seattle, WA; 2010-2012.

Professional Activity

Conference Presentations

John P. Ney and David van der Goes (Poster, October 2012) ``Cost-effectiveness of Intraoperative Neurophysiologic Monitoring for Routine Cervical Spinal Surgery." The 59th Annual Meeting of the American Association of Neuromuscular & Electrodiagnostic Medicine, Orlando, FL.

Craig M. Zaidman, John P. Ney, and David van der Goes (Poster, October 2012) ``Decision Model for Cost-effectiveness of Nerve Ultrasound and Electrodiagnostic Strategies in Ulnar Neuropathy at the Elbow." The 59th Annual Meeting of the American Association of Neuromuscular & Electrodiagnostic Medicine, Orlando, FL.

John P. Ney and David van der Goes (Podium, April 2012) ``Intraoperative Neurophysiological Monitoring in Spinal Surgeries: Impact on Neurological Complications, Mortality, and Cost." The 64th Annual Meeting of the American Academy of Neurology, New Orleans, LA.

David van der Goes, Richard J. Wilke, and Louis P. Garrison (Poster, May 2011) ``Changing Cost-Effectiveness Early in the Product Life Cycle: the Example of Clopidogrel Bisulfate." International Society For Pharmacoeconomics and Outcomes Research 16th Annual Meeting, Baltimore, MD.

David van der Goes (Podium, November 2009) ``Child Well-being, Paradigmatic Family-start, and the Vietnam Draft". Southern Economic Association Annual Meeting, San Antonio, TX.

David van der Goes (Podium, June 2008) ``From the Vietnam War to Retirement: Are Veterans Healthy Enough to Enjoy Their 'Golden Years'?". American Society of Health Economists Biennial Conference, Durham, NC.

Conference Participation or Invitation

- Southern Economics Association, Session 12O ``Issues in Health and Aging", Session Chair, November 2008.
- National Bureau of Economic Research, Econometrics Minicourse, Invited Participant, summer 2007.
- National Bureau of Economic Research, Health Economics Session, Invited Participant, summer 2006, 2007, 2008.

Peer-Reviewing Activity

- Value in Health
- Journal of Health Economics

Owen Whooley
University of New Mexico
Department of Sociology, MSC05 3080
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Education

New York University	Sociology	PhD	2010
Boston College	Sociology	MA	2004
Catholic University of America	History/Sociology	BA	2002

Appointments

Assistant Professor, Department of Sociology, University of New Mexico — 2012 – Present
Senior Fellow, Robert Wood Johnson Foundation Center for Health Policy
Faculty, Combined BA/MD Program

Postdoctoral Fellow, New Brunswick, NJ — 2010 to 2012
NIMH Postdoctoral Trainee in Mental Health Services Research
Rutgers University, Institute for Health, Health Care Policy, and Aging Research

Honors and Awards

EU Research Grant, Department of Sociology, University of New Mexico — 2014
National Institute of Mental Health (NIMH) Postdoctoral Training Fellowship in Health Services Research — 2010-2012
Dean's Dissertation Writing Fellowship, New York University — 2009-2010
National Science Foundation Doctoral Dissertation Research Improvement Grant, Science, Technology, and Society Program (#0822913) — 2008
Graduate School of Arts and Sciences Summer Predoctoral Fellowship, NYU — 2007
MacCracken Doctoral Fellowship, NYU — 2004-2009
Graduate School of Arts and Sciences Service Fellowship, Boston College — 2002-2004
John K. Zeender Prize for Outstanding Thesis in History, Catholic University — 2002

Publications

(1) Whooley, Owen. Forthcoming 2014. "Nosological Reflections: The Failure of DSM-5, the Emergence of RDoC, and the Decontextualization of Mental Distress," *Society and Mental Health.*
(2) Whooley, Owen. forthcoming 2014. "Of Quantities and Quackery: Homeopathy, the Rhetoric of Statistics, and Epistemic Authority, 1840-1890," in *Creating Authority*, edited by Craig Calhoun and Richard Sennett. New York: NYU Press.
(3) Whooley, Owen. 2014. "Diagnostic and Statistical Manual of Mental Disorders (DSM)." In William C. Cockerham (Editor-in-Chief), Robert Dingwall (Co-Editor) and Stella R. Quah (Co-Editor). *The Wiley-Blackwell Encyclopedia of Health, Illness, Behavior, and Society*. Hoboken, NJ: Blackwell Publishing: 381-384.

(4) Whooley, Owen. 2013. *Knowledge in the Time of Cholera: The Struggle over American Medicine in the Nineteenth Century*. University of Chicago Press.
(5) Whooley, Owen and Allan V. Horwitz. 2013. "The Paradox of Professional Success: Grand Ambition, Furious Resistance, and the Derailment of the DSM-5 Revision Process," in *Making the DSM-5: Concepts and Controversies,* edited by Joel Paris and James Phillips. New York: Springer: 75-94.
(6) Whooley, Owen. 2012. "Useful for Whom? Clinicians, Researchers, and DSM's Many-Sided Nature," *Philosophy, Ethics, and Humanities in Medicine,* **7**:15-17.
(7) Whooley, Owen. 2010. "Organization Formation as Epistemic Practice: The Early Epistemological Function of the American Medical Association," *Qualitative Sociology, Special Issue on Knowledge and Practice,* 33(4):491-511.
(8) Whooley, Owen. 2010. "Diagnostic Ambivalence: Psychiatric Workarounds and the Diagnostic and Statistical Manual of Mental Disorders," *Sociology of Health & Illness,* 32(3): 452-469.
(9) Whooley, Owen. 2008. "Objectivity and its Discontents: Knowledge Advocacy in the Sally Hemings Controversy," *Social Forces*, 86(4): 1367-1390.
(10) Whooley, Owen. 2006. "The Political Work of Narratives: A Dialogic Analysis of Two Slave Narratives," *Narrative Inquiry*, 16(2):295-318.
(11) Whooley, Owen. 2004. "Situating Masterframes in History: The Religious Masterframe of the Abolition Movement and its Influence on Movement Trajectory," *Journal of Historical Sociology*, 17 (4): 490-516.
(12) Shandra, John M., Bruce London, Owen P. Whooley, and John B. Williamson. 2004 "International Non-Governmental Organizations, Grassroots Movements, and Carbon Dioxide Emissions: A Quantitative, Cross-National Analysis of Less Developed Countries," *Sociological Inquiry*, 74 (4): 520-545.

Scholarly and Professional Activities

Scholars Strategy Network (SSN)
American Sociological Association (ASA)
- Section on Medical Sociology
- Section on Science, Knowledge and Technology
- Section on Collective Behavior
- Section on History of Sociology (Graduate Student Paper Award Reviewer)

Social Science History Association (SSHA)

CRITERION 6. RESOURCES AND PLANNING

The unit has sufficient resources and institutional support to carry out its mission and achieve its goals.

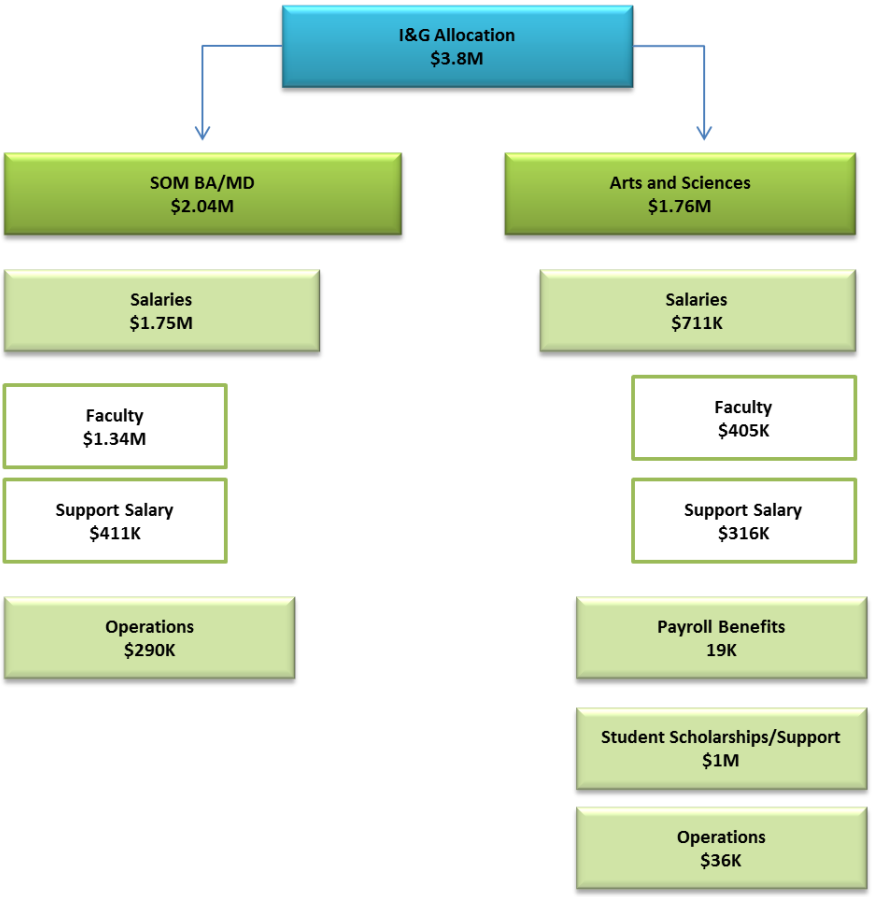
6A: Describe how the unit engages in resource allocation and planning. If the program or unit has an advisory board, describe the membership and charge and how the board's recommendations are incorporated into decision making.

Resource allocation and planning are conducted in the Program's Operations Committee, which meets twice a month and includes all BA/MD Program administrators (Directors, Assistant Directors, Program Managers) from both campuses, as well as the Associate Dean for UME from the SOM. Often, other leaders and faculty and staff members from the Program and across the university are invited to this meeting for discussion and consultation.

6B: Provide information regarding the unit's budget including support received from the institution as well as external funding sources.

The BA/MD Program is funded solely by the NM State Legislature through an instruction and general (I&G) allocation. Table 6B-1 provides a breakdown of the Program budget from a strategic lens. The Program budget is set and recurs annually.

Table 6B-1: Program Budget



6C: ***Describe the composition of the staff assigned to the unit (including titles and FTE) and their responsibilities.***

Arts & Sciences

Program Manager 1.0 FTE
Sets strategic direction, develops and implements work scope and related operational policies and procedures; provides operational planning, budgeting, and assessment. Manages and oversees the administrative and daily operations, ensuring compliance with university, state, and federal policies and regulations. Oversees the supervision of personnel, which includes work allocation, training, promotion and enforcement of internal procedures and controls, and problem resolution; evaluates performance and makes recommendations for personnel actions; motivates employees to achieve peak productivity and performance. Designs and develops or assists with design and development of program(s) or project(s). Manages state funding; approves and monitors budget expenditures; prepares budget revisions; provides interim status reports on all accounts; oversees, coordinates, and/or assists with proposal writing to develop additional funding. Provides technical and/or professional coordination and leadership in the execution of day-to-day program/project activities, as appropriate to program objectives and area of expertise. Develops annual operating budgets and provides fiscal direction to the unit. Develops and implements systems and processes to establish and maintain records for the operating unit. Oversees and/or coordinates the collection, compilation, and analysis of program activity data; develops, writes, and presents comprehensive statistical and narrative program reports. Assists in producing, developing, advertising, and marketing project(s) and/or product(s) in various media such as print and video; may assist in developing teaching materials, handouts, news releases, pamphlets, and brochures. Establishes and implements short- and long-range goals, objectives, policies, and operating procedures. Collaborates with university departments, programs, projects, local and state school systems, and/or community organizations to consolidate resources and enhance program. Develops or assists with the development and implementation of policies and procedures consistent with those of the organization to ensure efficient operation of the program/project.

Academic Advisement Specialist 1.0 FTE
Provides consultation, guidance, and professional leadership in the development of advisement and recruitment programs, initiatives, and strategies for University academic departments. Provides leadership in research regarding student development and retention across campus; develops methods for analysis and presentation of data, and prepares summary analyses, evaluative reports, and recommendations. Develops and maintains a network of collaborative relationships with other academic institutions and organizations, as well as with University colleagues with respect to academic advisement and student retention programs, initiatives, and issues. Plans, develops, and conducts educational seminars and/or workshops for faculty and staff on strategies, policies, procedures, and issues pertaining to student academic advisement and retention. Serves as a source of professional expertise for the organization on related academic affairs topics; maintains and disseminates a current knowledge and understanding of relevant developments, trends, policies, and emerging issues within the community and the general higher education environment. Deals directly with academic faculty, advisors, and/or University clientele in the management and resolution of complex and/or sensitive day-to-day

issues associated with degree matriculation. Provides input and assists in the formulation of overall University advisement, student recruitment, and retention policies, systems, and procedures. Actively participates in professional workshops, seminars, and associations local, state, regional, and national basis; to include conference presentations. May lead or supervise lower level staff in the execution of program/project initiatives.

Senior Academic Advisor 1.0 FTE
Provides academic consulting services to students, prospective students, and former students, including complex analysis and integration. Resolves problems relating to curriculum, course prerequisites, and eligibility by referring to catalogues and other appropriate resource material or governance manual. Receives and reviews transcripts to ensure eligibility for admission to a specific college or program including evaluation of transfer credits and applicability of academic credit to program requirements. May advise on certification or licensure requirements; evaluates transcripts and course work to ensure student remains on career track. Reviews student grade reports each semester to determine probation and/or suspension based on academic regulations of university; notifies and places students on probation or suspension; returns students to regular status after sufficient progress is made. Coordinates with other organizational units to process admission and graduation requests and to aid in resolution of academic problems. Reviews student files to ensure deadlines are met for completing various graduation requirements such as coursework requirements, theses, comprehensive examinations, and other specific program requirements. Participates in continuing in-service training related to academic information and advisement procedures. Assists in the development and implementation of advisement and recruitment programs and materials. Assists faculty advisement, athletic coaches, and/or other counseling personnel by providing records, evaluations, interpretations, and other requested data, recommendations, and conclusions. Assists in advisement, admission, certification and evaluation processes by performing supplemental administrative activities, such as securing requested information, verifying computerized data files, and preparing reports. May assist in formulating procedures and making decisions involving the application of academic suspension regulations, as appropriate to the position. May supervise lower graded staff and/or student employees; may participate in training and evaluative sessions and recommend methods to improve advisement activities.

Program Coordinator 1.0 FTE
Provides administrative support in the development, implementation, and marketing of program/project function. Serves as a principal liaison between students, faculty, staff, other departments, and/or external constituencies on day-to-day programmatic, operational, and administrative issues; facilitates seminars, meetings, special projects, and problem resolution. Coordinates activities of support staff, consultants, faculty, and/or volunteers engaged in implementation and administration of program objectives. Monitors and administers program/project revenues and expenses; may develop or participate in the development of funding proposals for the program. Writes, edits, and coordinates development of course catalogs, promotional materials, educational materials, training manuals, newsletters, and/or brochures, as appropriate to the program. Collects and analyzes data; prepares scheduled and special reports; maintains program/project records and statistical information.
Performs or delegates clerical and administrative support tasks, including creation, typing, and editing of program correspondence, purchasing documents, reports, program handbooks, and

other publications. Assists with grant and/or proposal writing as appropriate to the objectives and funding nature of the program; may participate in other fundraising activities.
May perform specialized activities of a programmatic nature in direct support of the accomplishment of program objectives and protocol.

Administrative Assistant II 0.75 FTE
Coordinates and performs a range of staff and/or operational support activities for the unit; serves as a liaison with other departments and operating units in the resolution of day-to-day administrative and operational problems. Provides administrative/secretarial support for the department/division such as answering telephones, assisting visitors, and resolving and/or referring a range of administrative problems and inquiries. Operates personal computer to compose and edit correspondence and/or memoranda from dictation, verbal direction, or from knowledge of established department/division policies; may prepare, transcribe, compose, type, edit, and distribute agendas and/or minutes of meetings. Schedules and coordinates meetings, events, interviews, appointments, and/or other similar activities for supervisors, which may include coordinating travel and lodging arrangements. Prepares or assists with the preparation of scheduled and/or ad hoc statistical and narrative reports; performs basic information gathering and analysis and/or forecasting, as specifically directed. Assists unit management and staff in problem solving, project planning, and development and execution of stated goals and objectives. Posts, balances, monitors, and reconciles internal department/division monthly ledgers, budgets, and financial reporting system reports; may prepare drafts of budget planning documents; may serve as department/division book holder and/or paymaster; may manage petty cash disbursements and reconciliations. Establishes, maintains, and updates files, databases, records, and/or other documents; develops and maintains data, and performs routine analyses and calculations in the processing of data for recurring internal reports. Sorts, screens, reviews, and distributes incoming and outgoing mail; composes, prepares, or ensures timely responses to a variety of routine written inquiries. Requisitions supplies, printing, maintenance, and other services.

School of Medicine

Program Manager 1.0 FTE
Sets strategic direction, develops and implements work scope and related operational policies and procedures; provides operational planning, budgeting, and assessment. Manages and oversees the administrative and daily operations, ensuring compliance with university, state, and federal policies and regulations. Oversees the supervision of personnel, which includes work allocation, training, promotion and enforcement of internal procedures and controls, and problem resolution; evaluates performance and makes recommendations for personnel actions; motivates employees to achieve peak productivity and performance. Designs and develops or assists with design and development of program(s) or project(s). Manages state funding; approves and monitors budget expenditures; prepares budget revisions; provides interim status reports on all accounts; oversees, coordinates, and/or assists with proposal writing to develop additional funding. Provides technical and/or professional coordination and leadership in the execution of day-to-day program/project activities, as appropriate to program objectives and area of expertise. Develops annual operating budgets and provides fiscal direction to the unit. Develops and implements systems and processes to establish and maintain records for the operating unit.

Oversees and/or coordinates the collection, compilation, and analysis of program activity data; develops, writes, and presents comprehensive statistical and narrative program reports. Assists in producing, developing, advertising, and marketing project(s) and/or product(s) in various media such as print and video; may assist in developing teaching materials, handouts, news releases, pamphlets, and brochures. Establishes and implements short- and long-range goals, objectives, policies, and operating procedures. Collaborates with university departments, programs, projects, local and state school systems, and/or community organizations to consolidate resources and enhance program. Develops or assists with the development and implementation of policies and procedures consistent with those of the organization to ensure efficient operation of the program/project.

Student Recruiter 1.0 FTE (2)
Provides career and academic counseling, planning, and advising to potential students; assists students in the development of testing strategies, writing skills, and completion of applications through seminars and workshops; coordinates applications for financial assistance. Participates in the development of student recruitment and retention plans, strategies, and written materials. Visits middle schools, high schools, and colleges, speaks to groups and individual students, and meets with school counselors to promote outreach activities; coordinates community workshops and retreats; arranges visits from prospective students and parents. Serves as a liaison to develop partnerships between the university and local school systems throughout the state. Creates a database of prospective and current students and/or potential degree candidates in the state. Creates and distributes resource materials for student recruitment and retention programs; develops mentorship programs; analyzes trends in recruitment and retention programs; develops strategies for program evaluation. Prepares reports and proposals, and responds to inquiries from students and minority agencies. Participates in the development of operating goals and objectives for the unit; recommends, implements, and administers methods and procedures to enhance operations, as appropriate to the unit.

Admissions Coordinator 1.0 FTE
Provides administrative support in the development, implementation, and marketing of program admissions. Serves as a principal liaison between students, faculty, staff, other departments, and/or external constituencies on admissions issues; facilitates seminars, meetings, special projects, and problem resolution. Coordinates admissions activities of support staff, consultants, faculty, and/or volunteers engaged in implementation and administration of admissions objectives. Writes, edits, and coordinates development of, promotional materials, educational materials, training manuals, newsletters, and/or brochures, as appropriate to the admissions. Collects and analyzes data; prepares scheduled and special reports; maintains program/project records and statistical information. Performs or delegates clerical and administrative support tasks, including creation, typing, and editing of program correspondence, purchasing documents, reports, program handbooks, and other publications. May perform specialized activities of a programmatic nature in direct support of the accomplishment of program objectives and protocol.

Administrative Assistant III 1.0 FTE
Oversees and/or performs a range of diverse administrative activities for the department or organizational unit; serves as a central point of liaison with other departments and external

constituencies in the resolution of a variety of day-to-day matters concerning the unit. Utilizes knowledge and understanding of underlying operational issues to create, compose, and edit technical and/or administrative correspondence and documentation. Assists in administrative problem solving, program/project planning, development, and execution of stated goals and objectives. Researches information, compiles statistics, and gathers and computes various data; prepares special and/or one-time reports, summaries, or replies to inquiries, selecting relevant data from a variety of sources. Monitors, reconciles, and assists with fiscal administration for the unit, including but not limited to budgets, funding, grants, contracts, payroll, employment, travel, and/or purchasing; may assist with fiscal planning, including participating in seeking alternate sources of funding. Provides and/or oversees support activities for the unit such as answering telephones, assisting and resolving problems and inquiries of visitors, review and control of incoming and outgoing correspondence, and follow-up on operational commitments. Provides administrative assistance with faculty and/or staff searches, as appropriate, to include logging employment applications; preparing applicant acknowledgements and interview documents, coordinating interview logistics, and coordinating search documentation. Schedules appointments and maintains calendars; schedules, coordinates and facilitates meetings, facilities usage, events, and/or travel arrangements, as required. Establishes, updates, and maintains unit's files, inventories, and records; implements and maintains data management systems, as required. Leads and guides the work of lower level staff, and supervises student employees as appropriate; may participate in hiring decisions and performance appraisal.

6D. ***Describe the library resources that support the unit's academic and research initiatives***

The A&S BA/MD program does not provide financial support for any specific library resource.

The SOM BA/MD program provides annual funding to the Health Sciences and Informatics Center (HSLIC) to support e-books and general acquisitions.

Resources provided by both libraries on both campuses are adequate for Program needs.

CRITERION 7. FACILITIES

The facilities associated with the unit are adequate to support student learning as well as scholarly and research activities.

7A: Describe the facilities associated with the unit and associated programs including, but not limited to, classrooms, program space (offices, conference rooms, etc.), laboratories, equipment, access to technology, etc.

Arts & Sciences

The Arts & Sciences BA/MD Program office, located in the University Advisement & Enrichment Center, building 85, partnered with the College of Arts & Sciences Advisement Center in suite 135, includes five offices and one three-quarter height walled office space. The five offices are occupied by the Academic Advisement Specialist (room 132), Sr. Academic Advisor (room 134), Program Coordinator (room 136), Program Manager (room 134-A) and the A&S BA/MD Director (room 138). The open office space is occupied by the three-quarter time Administrative Assistant II.

School of Medicine

The School of Medicine BA/MD offices are located within the Family Medicine Center, building 248 room 137. The Program shares office space with the Office of Community Health and the NM Immunization Coalition. The Program occupies four cubicles and two partially walled office spaces. The Executive Director, Director and Assistant Director are housed in their respective departments (Office for Diversity, Emergency Medicine and Anesthesiology).

7B: Describe any computing facilities maintained by the unit.

The A&S and SOM BA/MD Program offices do not maintain any computing facilities.

CRITERION 8. PROGRAM COMPARISONS

The programs within the unit are of sufficient quality compared to relevant peers.

8A: Provide information on the distinguishing characteristics of the programs within the unit. Discuss the unit's programs in comparison with other programs such as number of faculty, student characteristics, [and] types of programs.

In 2011, there were 81 distinct BA/MD programs available at 57 United States medical schools (Eaglen et al., 2012). BA/MD programs vary enormously in their mission, goals, and purposes. Some programs seek to encourage honors students to become physicians, some to produce medical researchers or to shorten the duration of medical training, and others, like UNM's Program, seek to increase the number of providers for rural and/or underserved populations. Of the 57 medical schools that offer BA/MD programs, 14 (25%) have one or both of the following as their stated goals: 1) the training of primary care and community practitioners; 2) meeting the needs of underserved populations. These 14 schools are listed in Table 8A-1; they are ordered alphabetically by state. UNM's program is highlighted in gray. The 14 schools are located in all areas of the country, most restrict their applicants to high school students, and the programs vary greatly in size. UNM's program is the second largest of schools with available data on class size, and is the only one of the 14 in the mountain west region of the country.

It is difficult to compare characteristics of UNM's program, beyond those listed in Table 8A-1, with other schools' since few schools have published data on the outcomes of their programs. Of the schools that have goals similar to UNM's, we are aware of only two for which data on academic preparation, student retention, and minority status of students are available: Sophie Davis in New York (Roman, 2004) and Baylor College of Medicine in Texas (Thomson et al., 2010). (See Table 8A-2). UNM's BA/MD Program is the youngest of those listed in the table; the number of students in our Program is larger than Baylor's but considerably smaller than Sophie Davis'. Undergraduate matriculants' at all three institutions had similar academic preparation, as measured by ACT scores. Retention rate, the percent of undergraduate matriculants who move on to medical school is often low in the early years of a program, but tends to increase as the program becomes established. Sophie Davis has not published retention rates of its early years, but they state that in the last 15 years (their program had been running for 30 years at the time of the publication) their retention rate was 82-85%. The Baylor program had a fairly low retention rate for the first seven years of their program (63%) but retention rates had increased to 90% for the most recent four years. UNM's rate of 69% is closer to the early years of the Baylor program than to the later years of either Sophie Davis or Baylor. We believe this is a reasonable rate considering the young age of our Program. UNM is intermediate in the percent of medical school matriculants who come from ethnic groups considered under-represented in medicine (55% at UNM, 33% at Sophie Davis and 82% at Baylor). We conclude, given limited comparison data, that UNM's BA/MD Program compares favorably with the early years of more established programs.

Table 8A-1: Medical schools offering Combined Baccalaureate-MD Programs whose explicit goals are one or both of the following: to train primary care doctors; to emphasize the care of the underserved

State	School	Applicant Pool*	# of Seats Available
DC	Howard University College of Medicine	HS	6-10
FL	Florida State University College of Medicine	HS	7
IN	Indiana University School of Medicine	HS	9-10
KS	University of Kansas School of Medicine	C2	16
MI	Michigan State University College of Human Medicine	C3	Not stated
MS	University of Mississippi School of Medicine	C2	Not stated
NC	The Brody School of Medicine at East Carolina University	HS	4
NM	University of New Mexico	HS	28
NY	Albany Medical College	HS	15
NY	Sophie Davis School of Biomedical Education at the City College of New York	HS	70-75
NY	State University of New York Upstate Medical University	HS	Not stated
PA	Drexel University College of Medicine	HS	Not stated
TX	Baylor College of Medicine	HS	10-15
TX	Texas A&M Health Science Center College of Medicine	HS & C1	15

** HS = High School; C1 = 1st year college; C2 = 2nd year college; C3 = 3rd year college*
Source: Eaglen et al., 2012

Table 8A-2: Program outcomes for UNM's BA/MD program and two other BA/MD programs with published outcome data that have similar goals to UNM's

School	Year Program Started	# Students per under-graduate class	Mean ACT of under-graduate matriculants	Retention: Percent of undergraduate matriculants moving on to medical school	% of medical school matriculants who are under-represented minorities[≠]
Sophie Davis School of Biomedical Education	1973	70-75	25.6	Early years: Unknown More recently: 82-85%	33%
Baylor College of Medicine Premedical Honors College	1994	10-15	27*	Early years: 63% More recently: 90%	82%
University of New Mexico Combined BA/MD Program	2006	28	27	First four years: 69%	55%

** Mean SAT score converted to ACT equivalent*
[≠] Under-represented minority indicates minority students who are under-represented in medicine: Hispanic, African American, and Native American

Sources:
Roman, 2004 (Sophie Davis)
Thomson et al., 2010 (Baylor)
Office of Program Evaluation, Education, and Research (UNM), UNM data are current as of November 2013

References:

Eaglen RH, Arnold L, Girotti JA, Cosgrove EM, Green MM, Kollisch DO, McBeth DL, Penn MA, and Tracy SW. (2012). The scope and variety of combined baccalaureate-MD programs in the United States. Acad Med. Nov;87(11):1600-8.

Roman SA, Jr. (2004). Addressing the urban pipeline challenge for the physician workforce: the Sophie Davis model. Acad Med. Dec;79(12):1175-83.

Thomson WA, Ferry P, King J, Wedig CM, and Villarreal GB. (2010). A baccalaureate-MD program for students from medically underserved communities: 15-year outcomes. Acad Med. Apr;85(4):668-74.

CRITERION 9. FUTURE DIRECTION

The unit engages in strategic planning and prioritization in order to achieve its mission and vision.

9A: Provide a summary of strengths and challenges for the unit.

Strengths

Perhaps the most important strength of the BA/MD Program is that it has already produced physicians. Beginning in May of 2013 with two students who completed the dual degree program one year early, and most recently in May of 2014, when members of the first admitted cohort to the program graduated from the UNM School of Medicine, the program has already produced physicians in many different residencies who are making a difference in the lives of patients.

Just as importantly, the BA/MD Program is both a leader and an example to the larger university as a positive collaboration between two very different colleges/schools, with very different administrative and academic cultures. Between Arts & Sciences on main campus, and the School of Medicine on north campus, there is widespread mutual respect, collegiality, shared vision and leadership, as a well as history of innovation that has benefited practices on both sides of what is often referred to with a somewhat negative connotation as "the Lomas (boulevard) divide." This model is especially important in 2014 as the University moves to initiate a new School of Population Health, which will need to establish the kind of collaborative trust and shared resources in order to thrive.

The BA/MD Program is a hallmark program for the legislature, the institution, and a source of pride for our local communities, and in especially so in the six different rural communities where our students each year serve during their Summer Practicums.

One clear strength of the BA/MD Program is its interdisciplinary major, taught by its own dedicated and invested faculty. It is worth repeating here that most of the more than 50 BA/MD programs nationwide do *not* have their own pre-medicine major, with special humanities and social sciences seminars, but most do not have their own faculty, either.

Year after year, in our end-of-semester and end-of-program evaluations, our students tell us that they think one of the program's principal strengths is our advising and student support. Karen McGillvray and Bryn McCabe-Kelly have been with the program for a combined 15 years. Not only do they understand backwards and forwards the degree matriculation process, they provide outstanding support in less tangible, more complex, important sense of making the BA/MD Program feel like a second home to our students.

Another program strength is its contribution to the larger university, through (a) its use of funds to hire additional full-time, tenure-track faculty into the departments within Arts and Sciences, and (b) the introduction of an HMHV minor, with a full suite of courses staffed by BA/MD faculty, available to all students in the general UNM population.

Finally, the BA/MD Program prides itself on our campus relationships with Residence Life, CAPS, the Deans' Office, the Admissions Office (both SOM and main campus), the Bursar's Office, the Registrar's Office, the Scholarship & Financial Aid Office and the Honors College. Because our students are admitted differently, funded differently, carry different tracking

attributes, and receive complex "last dollar" scholarships, our positive relationships with the different offices of UNM are integral to the Program's and the students' success.

Challenges

Our principal ongoing challenge is the retention of rural and minority students from educationally disadvantaged areas of the state – especially our Native American and African American students. As much as this, as a diversity pipeline program for the School of Medicine, it is also our ongoing challenge, through expanded and increased recruitment efforts, to increase the eligible applicant pool of Native American and African American students.

9B: Describe the unit's strategic planning efforts.

In order to address the above challenges, the Program, over the past four years, has (1) instituted sweeping changes in pedagogy and class size in all of our required basic sciences courses, (2) introduced a new summer bridge course to better prepare our students for the college transition in the sciences, and (3) hired an additional Student Recruiter and expanded our recruitment to include the entire Navajo nation in Arizona.

Guided by our new goals and SLOs, beginning this fall of 2014, the Program will use this new assessment data in both our subgroups and the larger CCSP to continually refine best practices pedagogy and incorporate critical reasoning methods into our undergraduate courses to better prepare students for their transition to the first year of medical school.

9C: Describe the strategic directions and priorities for the unit.

Three future strategic directions, in order of priority, are:

1. Improve retention of rural and minority students.
2. Better understand the learning transition between undergraduate and medical education.
3. Continue to implement active learning practices across the curriculum and develop course intersections within and across the disciplines.

LIST OF FIGURES & TABLES

APPENDICES

BA/MD APR — APPENDIX 1

Mission of The University of New Mexico

The mission of The University of New Mexico is to serve the educational needs of the citizens of the state, and those of the nation and world. This mission involves four (4) interrelated dimensions:

(1) The University develops and offers comprehensive educational programs at the associate, baccalaureate, master, and doctoral levels in a wide range of academic, professional, and occupational fields.

(2) The University, a designated Carnegie I research university, conducts research and engages in scholarly and other creative activities to support undergraduate, graduate, and professional educational programs, and to create, interpret, apply, and accumulate knowledge.

(3) The University contributes to the quality of life in New Mexico by providing selected services to the public that are part of, contribute to, or originate from the University's teaching and scholarly activity programs.

(4) The University Health Sciences Center is a valuable resource to New Mexico. Added value is provided to health care through leadership in providing innovative, collaborative education; advancing the frontiers of science through research critical to the future of health care; delivering health care services that are at the forefront of science; and facilitating partnerships with public and private biomedical and health enterprises.

BA/MD APR — APPENDIX 2

Curricular redesign in basic science classes that comprise the pre-medical core within the BA/MD Program.

Sushilla Knottenbelt, Kelly Howe, Christopher Johnston, Mark Morgan-Tracy, Martina Rosenberg, Helen Wearing and Lisa Whalen

Contents

Motivation for the redesign:

The BA/MD Program is a diversity pipeline program with the mission to increase the number of doctors in underserved areas of New Mexico. To achieve this mission, it recruits students widely across the state to achieve cohorts that are 2/3 rural and 1/3 urban, with special emphasis on traditionally under-represented ethnicities (Hispanic and Native American). The students selected are among the best in their high school and are highly motivated to become doctors, but often have very limited background and skills in Mathematics and Science. In its first iteration, the program provided (in a series of seminar classes) a specialized humanities for medicine curriculum (Health, Medicine and Human Values, HMHV) and a strong advising support system for students, while they took the traditional pre-medical science curriculum alongside their UNM peers in large lecture classes. Students were observed to excel in their humanities classes, but many (and especially those from rural areas and under-represented ethnicities) struggled with their science classes. Attrition from the program was most commonly due to failing to make the pre-medical GPA milestone. Analysis from the PEAR office (Office of Program Evaluation, Education and Research) showed that students with an ACT score of less than 25 were significantly more likely to not achieve their academic milestones and have to leave the program. With the diversity mission of the program, entering ACT score was only one factor in considering admission. A possible reason for the difficulties students face in the basic sciences core is the class size and structure. Traditionally, introductory science classes are taught in large sections of between 100 and 400 students, and students must make a special effort to become acquainted with the instructor. In part due to the size, these classes are often taught using traditional lecture methods with very little collaboration between students. The students are often alone in their rooms with their homework when they face the most difficult application problems in the course. These factors, compounded by a weak background, contribute to lack of confidence in their abilities and reluctance to ask for help. In turn, this leads to lower grades or at worst, course failure. The student gets off track from their cohort by having to repeat classes; when they eventually do pass, they often do not have the mastery needed for future classes and may eventually have to leave the program because of failing to meet GPA milestones.

In response to this, over the course of one year, the BA/MD Program hired seven joint-appointment faculty to teach smaller sections of the pre-medical core science classes. These sections were capped at about 50 students and were populated with up to 28 BA/MD students and the remainder general UNM students. Table 1 compares the section size in traditional versus BA/MD redesigned sections. Faculty were encouraged and supported to incorporate research-based pedagogy in these classrooms by means of a two day course redesign institute facilitated by the Office for Support of Effective Teaching and a faculty commons to facilitate peer observations, gather effective student feedback, share best practices, and brainstorm solutions.

Table 1: Section sizes in traditional and BA/MD Sections

Class	BA/MD section size (number of students)	Traditional section size (number of students)
MATH 180	50	40-50
CHEM 121 and 122	50-54	180 (used to be 300-400 until Fall 2013)
CHEM 301 and 302	50	120
BIO 201	50	140
BIO 202	50	130
PHYS 151 and 152	50-54	150-200
BIOC 423	30	100-140

Redesign philosophy:

Although there is significant variation in how faculty chose to redesign their BA/MD section, there are some common themes that are consistent with research on best practices in teaching and learning.

1. Active learning: a convincing body of research including a recent meta-analysis has shown that active learning increases student achievement and retention over traditional lecturing. Particularly relevant to the BA/MD student population are the findings that the achievement gap between under-represented minority (URM) and non-URM students decreases when active learning is incorporated into the classroom. The BA/MD basic sciences faculty use a range of active learning techniques to increase student engagement, ranging from using clickers to increase participation during lecture to structuring the entire class in order to give students responsibility for basic acquisition of facts and concepts before class, which opens up class time for collaborative learning involving higher level skills. Table A1, in the appendix summarizes the elements of active learning incorporated into each redesigned class.

2. Student feedback: The Group Instructional Feedback Technique (GIFT) evaluation is used at least once a year by each faculty member. This technique pairs up two faculty members who collect mid-semester feedback from students in each other's classes on what their instructor does to aid their learning, to hinder their learning, and what the instructor could do to improve their learning. The faculty members discuss the evaluations with each other and brainstorm solutions to problems students have raised. The GIFT technique gathers information about the student perspective on their learning and facilitates changes mid-semester to optimize learning in the classroom, as well as provides an opportunity for faculty to connect and share experiences and best practices in their classes, and troubleshoot difficulties.

3. Peer feedback: Each faculty member pairs up with another member of the group to exchange a peer-observation at least once a year. The observation is structured around what the faculty member being observed is most interested in feedback on, and what the observer finds interesting or useful from the perspective of their own class. The group is considering moving to a research

established observation protocol (COPUS) to help quantify the nature of classroom time in terms of how often students are actively engaged with their learning.

What does the smaller class size afford to improve student learning?

1. Easier to employ best practices pedagogy: Instructors can more easily use collaborative learning techniques, such as assigning groups and requiring in-class group work. Instructors find it more manageable to assign graded (non-multiple choice) in-class work or homework, providing students with better feedback. In the Introductory Biochemistry class, the smaller class size enables the instructor to use an innovative assessment technique that both assesses and develops critical thinking – the Individual Problem Solving Assessment (IPSA).[5]

It is interesting to note that most of the instructors teaching the BA/MD sections did not spend a significant amount of class time on active learning before they taught in redesigned classes, and having tried the active learning techniques in their smaller BA/MD section, most now employ an increased amount of active learning in their larger classes. In this way, the redesign of the BA/MD sections can be viewed as a catalyst for positive pedagogical change in the larger sections too.

2. Use of learning studio classrooms: There is some exciting evidence that studio classrooms can optimize the gains seen with active learning to increase student engagement and achievement.[6] UNM has 3 learning studio classrooms, designed to optimize collaborative learning, with round tables instead of fixed tier seating. The room has no front and is designed to shift the focus of class time from teacher to student. Most of the large sections of these classes are too large to fit into the learning studios. Three instructors regularly teach their BA/MD section in a learning studio.

3. One-on-one interaction between instructor and student: all instructors mentioned this as a primary benefit of the smaller classes, reporting more opportunity to connect with individual students and to ensure each one is participating. In the smaller class, students get to know the instructor better and may feel more comfortable asking questions. They are also more likely to get their questions answered and learn that they can ask questions in class. Instructors report having a better sense of what students know and do not know, and hence are able to better tailor the class to what the learners most need. Instructors teaching in studio classroom environments report that not only the class size but the layout of the class (round tables instead of stadium seating) facilitates interaction between students and between students and instructor. It is easier to identify and intervene with struggling students.

4. Student-student interaction: In the smaller classes, and particularly when groups are assigned and kept constant for significant time periods, students develop a sense of community which may support them when they face difficulties with the class. The BA/MD students already have a sense of community within their cohort, but being able to collaborate on difficult course material offers the opportunity to deepen their connection and develop teamwork skills. The connections between BA/MD and non-BA/MD students in these classes are important too and help to integrate the BA/MD students into the wider university population. The high level of motivation of the BA/MD students may rub off on some of the non-BA/MD students, increasing their motivation too (some evidence in support of this will be provided in the Assessment section of the report).

5. Embedded examples from health sciences: a population of students with a common career goal enables the course content to be delivered in the context of human health. This is motivating for the students and should help them transfer the knowledge into a health sciences context. In one course in particular, Elements of Calculus, an entirely different textbook is used than those in the general sections, to deliver the content in the context of health sciences.

In addition to the smaller class sizes, the BA/MD program provides support in the classrooms through teaching assistants, supplemental instruction leaders or both. A number of instructors commented on this as a significant factor in their willingness to incorporate active-learning into these sections, as well as improving their ability to grade student work and provide feedback.

In summary, the smaller classes offer faculty the flexibility to design their classes to optimize student learning. This includes increasing interaction with students and between students. In a larger class, it is often prohibitive in terms of organization and time to use these best practices. Because of the smaller classes (and the pedagogy that is possible in them), students develop better relationships with their peers and their instructor.

Assessment: how effective are redesigned classes in improving student learning and engagement?

A variety of measures are presented to assess the effectiveness of the course redesign. Four instructors teach a large section of the class as well as the smaller BA/MD section and in these classes, comparisons are possible between the large class environment and small class environment with the instructor variable controlled. In some cases, instructors who taught the class before the redesign have provided data to compare the redesigned class to historical data. The range of data that is considered includes

- student achievement and success (in terms of end of semester grades and % of students passing the class)
- gain on concept inventories
- mid-term and final exam scores
- student perspective
- instructor perspective

Note that not all measures are compared for all of the classes, depending on the individual course design and level of departmental coordination of sections of the same course.

Important caveats exist in interpreting the assessment data: Even when direct comparisons within a semester of two sections taught by the same instructor are possible, there are many confounding variables that make it difficult to definitively attribute a difference between large and small sections to a difference in pedagogy.

a. Class size is an important variable (although as discussed later, it is the smaller class size that has enabled the faculty to choose optimal active learning techniques that might be daunting to implement in larger classes).
b. The effect of student motivation cannot be underestimated, especially in the 100 and 200 level classes. Whatever their science or math background, the BA/MD students come to their classes with a high level of motivation and willingness to work hard. In a class that is roughly 50% BA/MD students and 50% general UNM population, this results in a much more motivated group of students than in the larger general education introductory science classes where many students are still exploring their options at college and may not be as committed to success in the sciences as these students.
c. Also important to note when comparing the small BA/MD section to the large general population section taught by the same instructor, is that the large section may be taught in a traditional lecture style classroom, but in most cases, the pedagogy is also active-learning intensive, although usually less so than the smaller classroom. Most of the comparisons presented here are NOT simply large class traditional lecture versus small class active learning.

Effect on student achievement and success:

Final grade distributions and success rates can be compared for 3 instructors who teach two sections of the same class – the BA/MD redesigned section and a larger class taught in a more

traditional lecture environment (*although in all three cases, the large lecture environment includes a significant component of active learning*). Results presented are from General Physics I and II (Fig. 1) and Organic Chemistry I and II (Fig. 2). The equivalent data from General Chemistry is examined in greater detail as a case study at the end of the section.

Grade distributions by section type in General Physics and Organic Chemistry

Figure 1: Final grade distributions in General Physics 1st semester (PHYS 151) and 2nd semester (PHYS 152). LH = Lecture Hall with general UNM Population and larger section sizes, solid fills, BA/MD section data are shown with patterned fills.

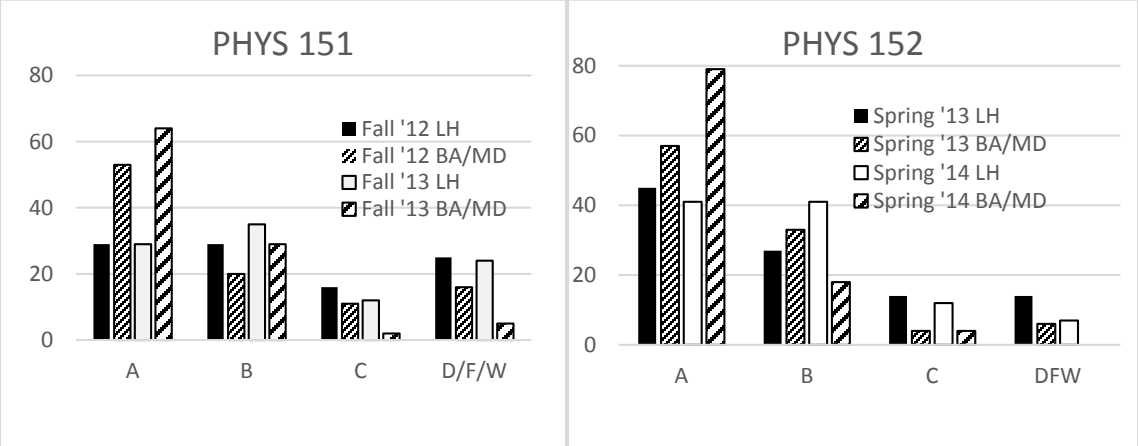
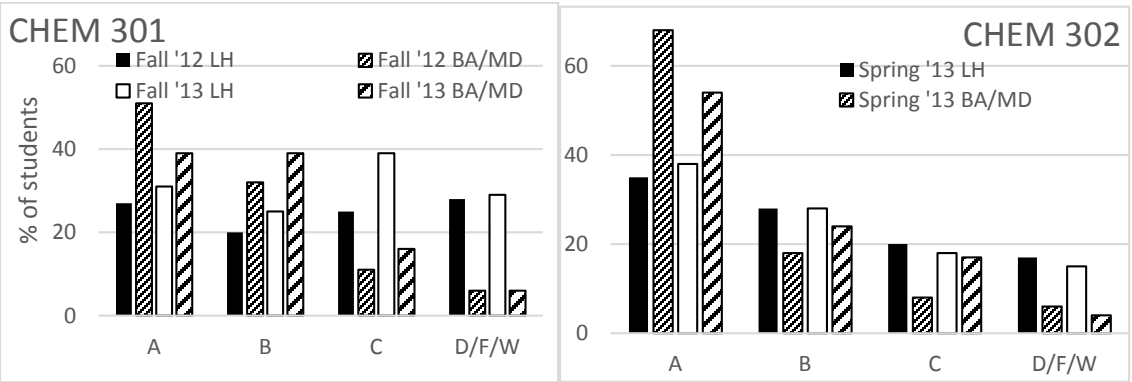


Figure 2: Final grade distributions in Organic Chemistry 1st semester (Chem 301) and 2nd semester (Chem 302) LH = lecture hall with general UNM population and larger section sizes, solid fills; BA/MD section data are shown with patterned fills.



The General Physics and Organic Chemistry data shown in Figures 1 and 2 comes from different sections taught by the same instructor for two semesters of each course. For both disciplines, the BA/MD section was capped at around 50 students and contained both BA/MD students and general UNM population in similar ratios. The general UNM population of students in the BA/MD section was not selected based on academics, but they had to contact the instructor and request an override. The BA/MD sections were taught in learning studio classrooms. The LH (lecture hall) classes were larger sections (at least double the size of the BA/MD sections), unrestricted in enrollment apart

from pre-requisites and taught in a traditional lecture hall classroom. In both disciplines, the large section also contained a significant component of active learning. The data in Figures 1 and 2 contains some important take-home points:

- Significantly lower D/F/W rates in the BA/MD section: students in the BA/MD section have a much greater chance of passing the class
- Higher percentage of students getting As and Bs: students passing the class in the BA/MD section have higher grades than those passing in the non-BA/MD sections.
- In both Physics and Organic Chemistry, students in the 2nd semester classes are more likely to pass and get a better grade than in the first semester class. This is probably due to the 'weed out' effect of the 1st semester class. Students need to pass the first semester class in order to register for the 2nd semester class, and hence are 'selected'.

Student achievement results from classes in which direct grade comparison is not possible: Molecular and Cell Biology, Genetics, Elements of Calculus and Biochemistry

Molecular and Cell Biology (BIOL 201): the instructor of this section did not teach a large section in the same semester and had not taught a large section historically. However, data from this section can be compared with the large sections. Using data from the Spring of 2014, students in the small class outperform those in the larger sections of BIOL 201. The overall average course percentages for the BA/MD and large sections were 96.6% and 79.1%, respectively.

Genetics (BIOL 202): Overall scores have improved for all sections taught by this instructor after implementation of redesign principles in large and small sections.

Elements of Calculus (MATH 180): as previously, the instructor did not concurrently teach another section of Math 180 with which to make comparisons. In addition, direct comparisons with other sections are problematic because BA/MD section uses a different textbook and takes a different approach: the class is designed specifically for students interested in the life sciences, whereas other sections target a broader audience (including business majors).

Introduction to Biochemistry (BIOC 423): the instructor did not teach a large section of BIOC 423 and had not taught one historically. Owing to different grading policies, a direct comparison of course grades between small and large sections is not meaningful, but more detailed assessment on student learning outcomes is presented in a later section. Overhaul of the undergraduate Biochemistry curriculum starting Fall 2014 should present more opportunities for assessment when sections are more aligned.

In summary, students in the smaller redesigned classes are more likely to pass the class and get a better grade in the class than students taking the large class. The data presented above raise some questions:

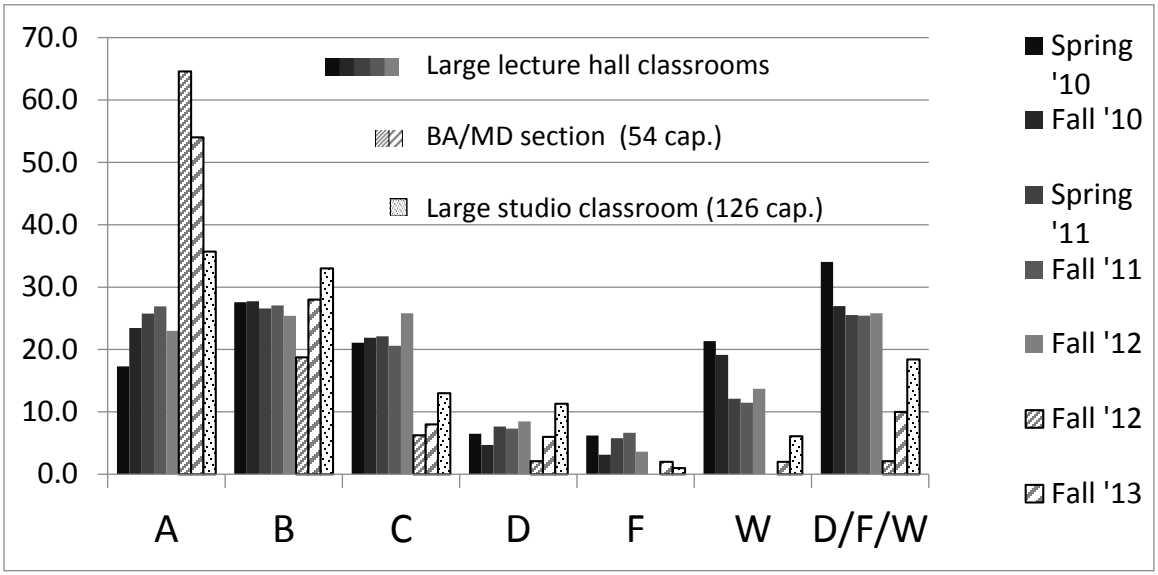
1. Given that the BA/MD program selects students on a competitive basis, is it the population in the small classes rather than the class size or the pedagogy that is responsible for the improved student achievement and success?

2. Can similar gains be obtained from larger classes incorporating the same pedagogy and the general UNM population?

More detailed data from General Chemistry allows these questions to be addressed in a preliminary way.

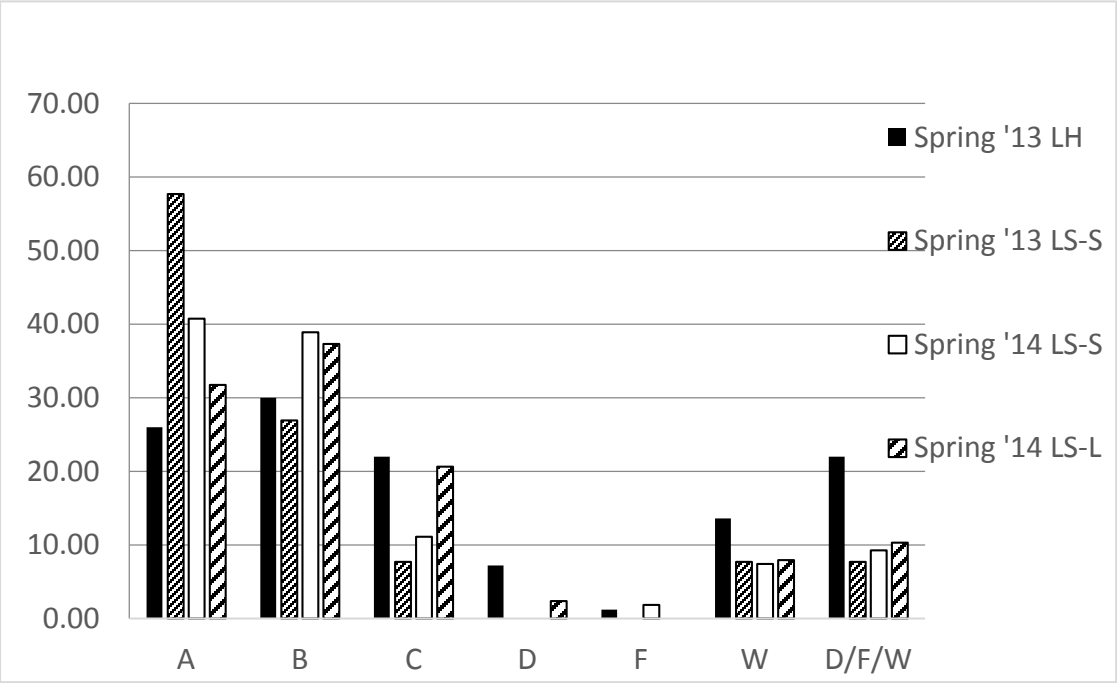
Grade distributions by section type in General Chemistry.

Figure 3: General Chemistry I (CHEM 121) Grade distributions showing % of students attaining a particular grade in different class environments in different semesters



The improved retention and achievement shown in Organic Chemistry and Physics are also shown in General Chemistry (Figure 3 and 4) and can be seen with some historical context for General Chemistry I sections taught by the same instructor. The instructor averaged a 75% success rate with very little variation between semesters after the 1st semester teaching the class. In Fall 2012, a large lecture hall section was taught alongside the small BA/MD section, and the large section had a 75% success rate, while in the small section, it was 97%. In Fall 2013, the instructor taught the small BA/MD section (success rate 90%) alongside a large studio classroom containing general UNM population students (success rate 82%). The results from the large studio classroom will be discussed further in a subsequent section of the report to address question 2. General Chemistry II (Fig. 4) also shows the familiar trend, with significantly improved retention and achievement in the smaller section.

Figure 4: General Chemistry II (Chem 122) Grade distributions showing % of students attaining a particular grade in different class environments in different semesters. LH=Large section, LS-S = small section in studio classroom, LS-L = Large section in studio classroom.



Question 1: Is the improved retention and achievement in the smaller sections due to the fact that BA/MD students are selected?

A. Comparing student background in the General Chemistry small section between BA/MD and non-BA/MD populations

In the first week of their General Chemistry class, students took the Toledo test, an American Chemical Society exam designed as a diagnostic for entering college students (Table 2). National norms are provided for comparison. This data shows that compared with non-BA/MD students in the small section, BA/MD students have a better background in Math and Chemistry on average, but there is a wide distribution of scores, with a range of very high (98^{th} percentile nationally) to very low scores (7^{th} percentile). A more detailed graph showing the distribution of scores is given in the appendix, Figure A1.

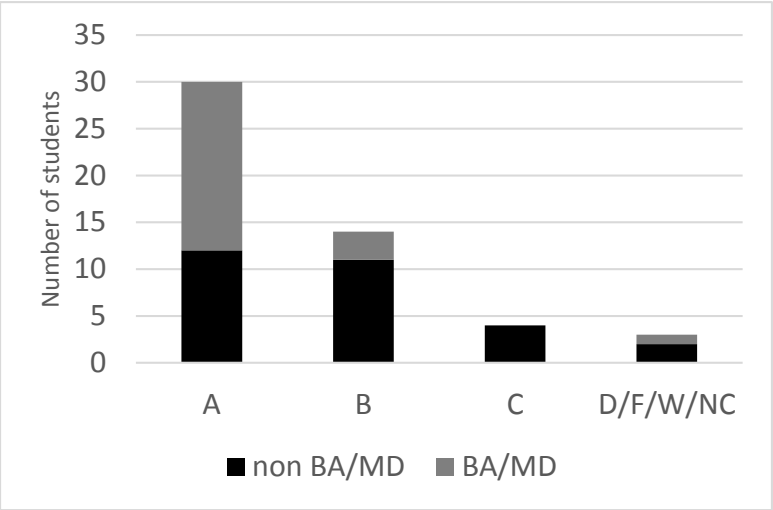
Table 2: Comparing background in Chemistry and Mathematics for students entering the small (BA/MD) section of General Chemistry.

	Mean Toledo test score out of 60 and standard deviation (parenthesis)	Compared with national norms
Fall 2012 BA/MD students	34.3 (6.5)	~65th percentile
Fall 2012 non BA/MD students	30.7 (4.1)	~46th percentile
Fall 2013 BA/MD students	35.9 (5.6)	~75 percentile
Fall 2013 non BA/MD students	30.9 (5.4)	~47th percentile

Thus, the BA/MD students would be expected to perform better *on average* than the non-BA/MD students in the class, based solely on their incoming background. Those students (BA/MD and non-BA/MD) who enter with very low background knowledge, would be expected to struggle more with the class and perform less well. In addition, BA/MD students are likely to have higher levels of motivation on average than the general UNM population because they are selected in a highly competitive program.

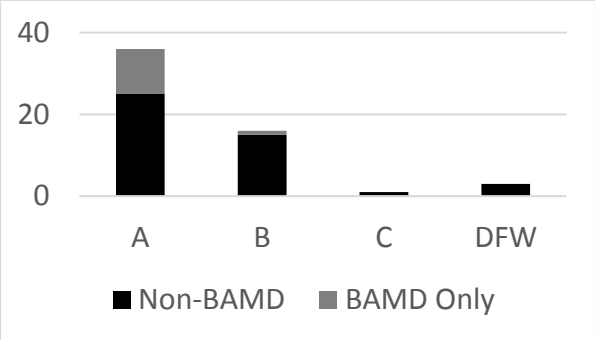
When the actual grade distribution is viewed by student population (BA/MD versus non BA/MD), it can be seen that the BA/MD students do much better than the non-BA/MD students (Figure 5). However, the non-BA/MD students in the small section are more likely to pass the class and do better on average than the students in the large section. In the large section, 56% of students attained As or Bs in the class. In the small section, 79% of the non-BA/MD students attained As or Bs. Thus the better grades in the small section are not only due to better performance by the BA/MD students with better background and higher levels of motivation.

Figure 5: Grade distribution by student population by student population for the small section of CHEM 122 Spring 2013 (A similar result can be seen for CHEM 121 from Fall 2012 – Appendix Fig. A2)



An even more pronounced effect can be seen for the data from the Physics classes (Fig. 6) Because Physics is taken later in the sequence, does not have any of the other core science classes as a prerequisite and is not a direct prerequisite itself, students chose to take it at different times in their curriculum. As such, of the ~50 person small 'BA/MD' section, often only about 20% of the students are BA/MD students. Recall the improved outcomes of students in the small section versus the large section for General Physics I and II (Figure 1), and not that the majority of students are non BA/MD.

Figure 6: Grade distribution in Physics 151 (Fall 2013, but representative of Fall 2012)



In summary, based on evidence from two different disciplines; general population UNM students enrolled in the small section have improved educational outcomes (retention and achievement) than those in the large section with the same instructor.

2. Can similar gains be obtained from larger classes incorporating the same pedagogy and the general UNM population?

In Fall 2013, UNM opened the new Collaborative Teaching and Learning Building, which included a 126 seat studio classroom. The instructor of the General Chemistry sections for the BA/MD program taught a section of CHEM 121 in the large studio in Fall 2013 and one of CHEM 122 in Spring 2014 alongside her small studio classroom BA/MD sections. The classes taught in the large studio classroom were unrestricted in enrollment (apart from the normal prerequisites) and thus were populated with an unselected group of general population UNM students. Figures 3 and 4 (pages 10 and 11) show that the students in the large studio classroom have significantly improved success rates and achievement compared with students in the lecture hall environment, but do not do as well in terms of retention or achievement as the students in the small studio.
This preliminary evidence from teaching General Chemistry in different classroom environments suggests that the optimal combination for success of ALL students involves the following elements:

- Research-established pedagogical methods (active learning) in a studio classroom (designed to optimize collaborative learning)
- A 'small' class size (54 students rather than 126)
- A motivated peer-group, at least some of whom have a strong background.

Thus far, of the courses that form the premedical core at UNM, only the General Chemistry sections have been taught in the large studio environment. It will be interesting to see if similar outcomes arise for these other courses.

Effect of student learning:

Faculty have used a variety of different measures to assess student learning in their classes. As for the grade data in the previous section, it is possible to make some comparisons between the small sections and the larger sections.

Concept inventories:

The Physics class PHYS 151 used a concept inventory (a test designed to evaluate whether a student has an accurate working knowledge of a specific set of concepts) which was administered at the start of the semester and at the end of the semester as a means of assessing student learning during the semester. In the semester of Fall 2013, the Force Concepts Inventory (FCI) diagnostic was used. The pre-test showed almost identical averages between the large section and the small BA/MD section, indicating that the two classes had fairly similar background knowledge. After the post-test, the average normalized gain was calculated to be 27.8% for the larger section and 29.0% for the smaller. Although the smaller section shows a higher gain, this is statistically insignificant. The similar normalized gains should be viewed in context of the much improved student retention in the small section. In the large section about 76% of students that started the class passed the class (and thus were present at the end of the semester to take the post-test), whereas 95% of students starting the small class passed the class and took the post-test at the end of the semester. **In summary, the small Physics section supported a significantly greater**

percentage of students to pass the class with on average a similar normalized gain as the large section.

Exam performance (mid-term and final)

Higher exam averages in small sections: Most instructors teaching a large and a small section report higher mid-term exam averages in their small BA/MD section compared with their large section. This is exemplified by data from Organic Chemistry (Table 3), in which exam averages are mostly higher for the small BA/MD sections than for the comparable large sections. Again, these exam averages should be seen in context of the greater retention in the smaller sections. It is not surprising that the last exam average is more comparable in the two sections than the first exam average, given that many more students in the large section have to drop the class, and only the stronger students 'survive'. The smaller class may support the weaker students in continuing and passing the class more, and this may be reflected in the similar averages.

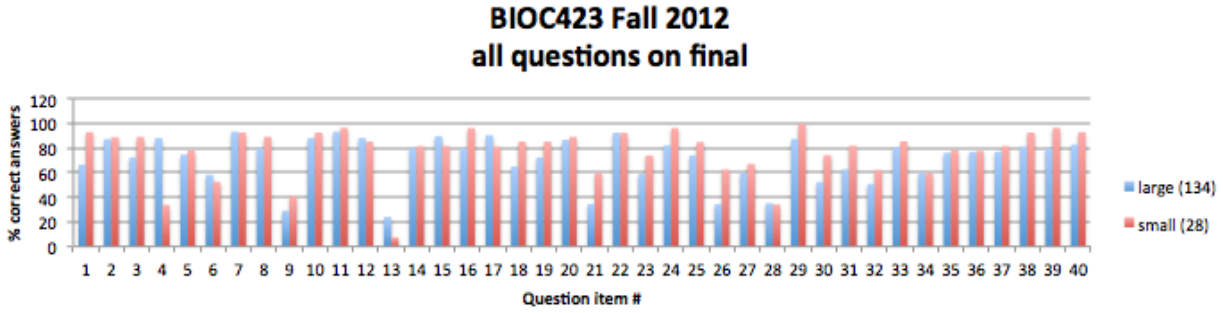
Table 3: Performance on mid-term and final exams in Organic Chemistry by section. Numbers in parentheses are the comparable average for the large section. All differences between small and large section exam averages of at least 5 points are shown in bold.

	Hour Exam I	Hour Exam II	Hour Exam III	Hour Exam IV
Chemistry 302 Spring 2014 Average: small section (large section)	**91 (85)**	**80 (73)**	66 (71)	46 (44)
Chemistry 301 Fall 2013 Average	**86 (81)**	79 (76)	**80 (75)**	41 (41)
Chemistry 302 Spring 2013 Average	**89 (75)**	**82 (73)**	**86 (77)**	44 (43)
Chemistry 301 Fall 2012 Average	**87 (80)**	**82 (73)**	**87 (68)**	**43 (38)**

Performance on specific concepts:

Introductory Biochemistry BIOC 423: in Fall 2012, the instructor of the small section collaborated with the instructor for the large section to include in the final exam for both sections several common questions that probed important concepts. Many aspects of the two sections were comparable: both instructors were teaching for the first time, both used student-centered pedagogies and both aligned their course content with each other. Fig. 7 illustrates the percent of correct answers of all test items at the two identical end of the semester finals in the two sections.

Figure 7: Comparison of performance on specific final exam questions by section. (large section, small section)



For 31 out of the 40 questions of the entire final, a higher percentage of students gave the correct answer in the smaller class. However, the difference in percentages is not very pronounced for many test items. The median *total* scores (grades) in both exams, are 72% and 80% respectively, reflecting a letter grade difference between a C- and C+. More detail can be found in the Appendix, including a comparison across semesters. In summary of the assessment from the Biochemistry class, students in the small section may perform slightly better than those in the large section on specific critical concepts that were assessed, but there is a need for more data to increase the numbers for statistical significance.

Organic Chemistry CHEM 301 and 302: Assessment data collected for specific learning outcomes in Organic Chemistry in Fall 2013 and Spring 2014 does not indicate a huge difference between the two sections. Both routinely struggle with the same difficult questions and do well on the easier questions. Most of the assessed concepts have a 'satisfactory' average of 70% mastery. (See Appendix Table A3 for data)

General Chemistry CHEM 121 and 122: In on-going assessment of specific concepts through mid-term exams, students in the small section routinely out-perform students in the large sections (same instructor and different instructors). Five questions addressing the same course learning outcome were given across 2 midterm exams and averages are reported by section. The highlighted section is the small BA/MD section.

Table 4 Assessment by General Chemistry section of Course Learning Outcome: Apply the mole concept to amounts on a macroscopic and a microscopic level and use this to perform stoichiometric calculations including for reactions in solution, gases and thermochemistry. (Addresses UNM/HED Area III, Competencies, 2, 4) Section 3 = BA/MD section.

% correct answer per section

sec	q1	q2	q3	q4	q5
1	42.65	61.25	74.81	71.43	82.85
2	45.25	67.21	75.90	67.76	85.06
3	55.10	62.50	91.84	89.80	93.75
4	43.96	65.93	72.83	73.91	65.22

Student perceptions of the redesign

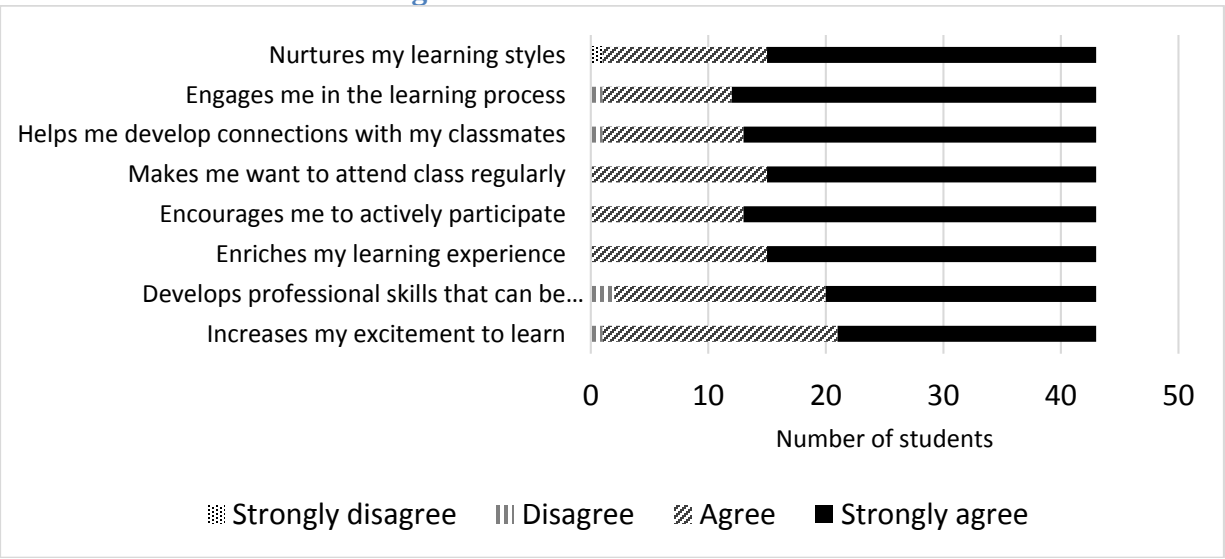
All instructors report mostly positive student feedback of the redesigned classes. Students generally believe they are learning more in the active learning course and comment positively on the increased contact time with their instructor. They perceive a 'personalized' learning environment, are happy with the class size and report that they benefit from it compared with those in the larger sections. Where formal group work is assigned, students report enjoying being able to work with other students and comment that is helps them learn, both when they explain to other students and when other students help them understand material. Non-BA/MD students who have taken the BA/MD small sections often request to be in other BA/MD sections and there appears to be a significant 'word of mouth' effect, where these sections are recommended to other students. This is noted in the emails of students who are requesting instructor permission to enroll in these classes.

Mid-semester GIFT evaluation results across sections show that students value the active-learning techniques and particularly being able to practice applying hard course material during class time with resources to help them with it. They appreciate the opportunity to give feedback and in end of semester evaluations show appreciation when the instructor has made changes based on their feedback.

In Elements of Calculus, MATH 180, average scores on IDEA forms for 'progress on learning objectives' increased in the semesters that the instructor implemented the redesign, where other scores remained fairly constant. This suggests that students perceive themselves to learn more in the small redesigned class environment.

In General Chemistry Fall 2013, an end-of-semester survey was given to students in the small class to assess their perception of the active-learning class environment. The results were overwhelmingly positive (Fig. 8), with an excellent rate of participation.

Figure 8: General Chemistry small classroom student responses to the question: The classroom in which I am taking this course...



Whereas student impressions of their learning in these courses are overall positive, there is a (often vocal) minority that objects to the collaborative learning process. A few students have petitioned to be able to take the larger section with the same instructor instead of the smaller section. A comment that appears with some frequency on surveys of student opinion and end-of-semester evaluations is the desire for more lecture during class time. In some of the classes that employ formal groups, some students are dissatisfied with their groups and report that they dislike working collaboratively.

In BIOC 423, a fast-paced class involving integration of many difficult concepts and relying on background from all the previous college biology and chemistry classes, student resistance has been at its highest. Until the last year, these students had completed all their previous science classes in traditional lecture environments, and they did not appreciate having a collaborative learning environment with little lecture in their biochemistry class. Although students are appreciative of the problem-solving opportunities that this class affords, the redesign seems to have done little to improve the overall anxiety level. It remains a content dense class in which students struggle.

Some typical positive student responses are given below:

'I really enjoy the group work because it encourages collaborative learning and even though we have a lot of work, it's so helpful because it really drills what we're learning into our brain.'
The best part of this class is… 'The organization of the class and the layout/design. We have a normal routine - there are pre-class assignments, in-class assignments that clarify misunderstandings, and after class assignments that reinforce the material.

Some typical negative student comments include:

'There isn't much of a lecture to go along with the class. So if you didn't read you are completely lost. If there was more of a lecture to the class that would be more helpful.'
'Being put in groups with random people- I've been in two groups, and while my first group was ok, my second group is a nightmare to work with.'

Instructor perceptions of the redesign

Like the students, instructors are mostly positive about the redesign, despite the time and effort involved in the redesign and the learning curve. In fact, only two out of the seven instructors had used a significant amount of active-learning in their classrooms prior to the redesign, and now all instructors who teach a larger section in addition to their smaller section use some of the redesign elements in their large sections. Two out of the seven instructors were new to teaching, and both incorporated elements of the redesign into the first classes they taught. Several instructors report trying out some new ideas in their smaller section, and then being able to 'scale-up' to use them in the larger classes in future semesters.

Instructors appreciate the smaller class size which enables them to get to know their students better and provide a better quality of feedback. They perceive improved student attendance and

engagement in the classroom and report the experience being more rewarding. They provided the evidence presented above of improved student learning and achievement.

Below are some verbatim instructor reflections:
'I much prefer teaching in a class where the students are actively engaged in learning. In fact, this experience has motivated me to incorporate more active learning in my other classes. Although there is considerable work involved in preparation (e.g. designing in-class worksheets), my time in class is more enjoyable and rewarding. In addition, it has made me reflect more deeply on what I want my students to learn and achieve from individual classes, and from the course as a whole. I also feel that I'm able to quickly identify students who are struggling (and those who need greater challenges).'

'I am a strong proponent of the idea that different instructors excel at different approaches to teaching and should therefore design their classroom to take advantage of these strengths. I also believe that traditional lecture has its place in the classroom and is an important component of student learning. However, as I strive to incorporate more active learning approaches into my classroom, I am realizing that it can be both effective for student learning as well as a rewarding experience for me as an instructor. Being able to make more personal connections with the students through more active mentoring and social group work has allowed me to understand the students' perspective and their struggles more than I would have through traditional teaching approaches. I believe these techniques also allow the students to feel more connected, and thus comfortable, with their professor, which is another positive aspect of the active classroom style.'

'While it was a significant amount of work to design problem sets and pare down lectures to a minimal length, I am happy with this redesign and very glad that I listened to my colleagues' ideas. I continue to change small things, such as how to make the class more spontaneous without making it disorganized, and increasing the length of the lectures for more difficult material. I strive to keep the class similar to the larger lecture course in content and pace, which is challenging at times. Finding ways to give students credit for their effort in class, fairly, while not making the class too easy, is tough. It is also a pain to rewrite quizzes every semester, but not impossible. Perhaps the best part about this redesign is that I have one course whose enrollment is limited to 50, which makes the grading much less of a burden.'

'The instructor of the physics-150 series is thrilled with the results of his incorporation of the flipped-classroom technique in his smaller section. The level of student engagement in the smaller section is unparalleled. The course-grade results also show that students are thriving in this environment. While there was no appreciable difference in normalized gain on the FCI, the instructor is pleased that lack of traditional lecture is not harming the smaller-section students. Also, the smaller DFW rate for the smaller section reminds the instructor that normalized gains are not the only desired course outcome.'

'From the student feedback and my own observations, one of the most positive aspects of the class was the working relationship developed in the groups – I think we achieved some true 'positive interdependence'. Attendance was excellent with very few students missing class, and then only for good reasons, and I believe the assigned groups were partly responsible for that. It was fascinating to watch them teach each other, sharing their ideas and understanding and arguing their

points. I experienced their learning journey every day and got to know them, their struggles and their triumphs very well. I learned so much about the way they see chemistry and chemical concepts and feel much better equipped to teach the next time around with this new knowledge. I felt more like a coach than a lecturer, and I intend to continue to use this structure as much as possible'.

Future Direction

Faculty provided several areas in which they plan to make improvements to their course in terms of student learning and assessment. In terms of student learning, they aim to:

- Increase the amount of class-time spent on student centered activities (in one case, with the aim of moving to a studio classroom eventually)
- Incorporate more deliberate feedback opportunities to encourage student participation in class
- Improve in-class activities to optimize them for group work and achieve the right balance of challenge and difficulty, and increase the level of higher-order thinking required of students
- Explore new methods of facilitating student preparation for class.

In terms of transferable skills:

- Build student metacognition using post-exam reflections and providing rubrics for homework grading.
- Incorporate team work as an explicit component of the class, and actively work on students' team work skills by incorporating group processing exercises.

To improve assessment (and extend what is known about student learning):

- Explore how students retain their content knowledge over time beyond the end of a course (in future courses, or just prior to taking their MCAT preparation)
- Improve exams as assessment tools of higher order thinking

Summary

Seven instructors were involved in the redesign of 10 pre-medical mathematics and science classes for the BA/MD program at UNM. The key elements of the redesign were small section sizes (about 50 students), active learning pedagogies, student feedback and peer feedback. Several sections were taught in studio classrooms designed to optimize active learning. All sections were composed of up to 28 BA/MD students and then filled with general UNM students. The most significant result of the redesign is improved retention (more students complete the class with a passing grade) and achievement (students pass the class with a better grade) than larger sections taught by the same instructor, using the same active learning philosophy (although active-learning techniques were usually applied to a greater extent in the small classes). Evidence from two classes suggests that both BA/MD and non-BA/MD students benefit from the smaller sections, and non-

BA/MD students may benefit in particular from taking these sections with the BA/MD students compared with their peers in large classes. Most small sections showed higher exam averages than large sections taught by the same instructor. Although there is some evidence of improved student learning of particular concepts in particular courses, other courses do not show evidence of specific improvements in learning compared with the large classes and more data is needed across the range of the courses taught. In general students respond very positively to the redesigned classes, and faculty report that they are significantly more rewarding to teach.

References

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3. Preszler et al. (2009) CBE—Life Sciences Education, 8, 182–192, 2009
4. Smith et al. (2013) CBE—Life Sciences Education, 12, 618-27.
5. Anderson et al (2011) *International Journal for the Scholarship of Teaching & Learning* 5.1.
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Appendix 2A: Curricular redesign in basic science classes that comprise the pre-medical core within the BA/MD program.

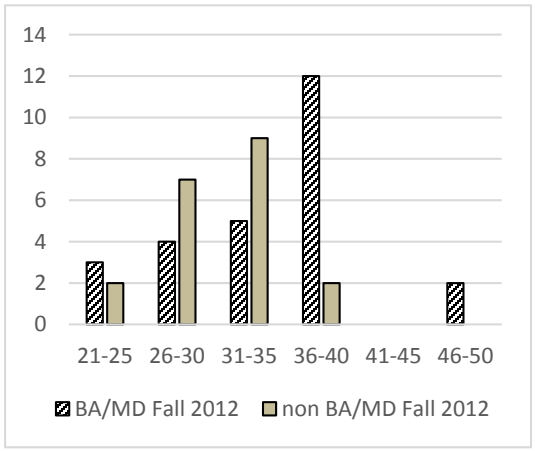
Table 2A1: Elements of active learning used in redesigned sections

Class	Pre-class preparation				In class work				
	Textbook reading assignment	Video lecture	Reading quiz	Muddy point question*	Peer facilitation/TA	Worksheets and active learning questions	Clickers	Group work	Other
MATH 180	X				X (1 UG SI)	X Think-pair share		X	
CHEM 121 and 122	X		X online before class	X online before class	X (1 UG TA and 1 UG SI)	X In each class Graded	X	Formal instructor set teams self and peer evaluations	Group quizzes
CHEM 301 and 302	X		X Open notes quiz given in first 5 minutes of class		X (1 UG TA and 1 UG SI)	X In each class Graded		Formal instructor set teams	
BIO 201					1 SI leader (1 TA?)	X, One per topic unit, One exam review worksheet per exam	X (with peer instruction)	Informal, occasional	Open Q and A exam review periods
Class	Pre-class preparation				In class work				

	Textbook reading assignment	Video lecture	Reading quiz	Muddy point question*	Peer facilitation/TA	Worksheets and active learning questions	Clickers	Group work	Other
BIO 202	X		X			active learning questions. Small group discussion chosen		Informal, occasional	
PHYS 151 and 152	X	X (as of Fall 2013)	X	X (as of Fall 2013)	1 TA	X In each class Graded		Formal instructor set teams	
BIOC 423	X		X	X (occasional)	1 GTA, 1 SI leader	X in each class, graded	X with peer instruction	Formal instructor set teams	Individual Problem Solving Assessments (IPSAs)

* A 'muddy point' question is a short piece of writing requiring students to reflect on the most difficult or most interesting parts of their pre-class preparation. UG = Undergraduate, G = Graduate. TA = Teaching Assistant. SI = Supplemental Instructor leader.

Figure 2A1: Distribution of Toledo test results showing spread of student scores on this General Chemistry diagnostic exam between BA/MD and non-BA/MD students.



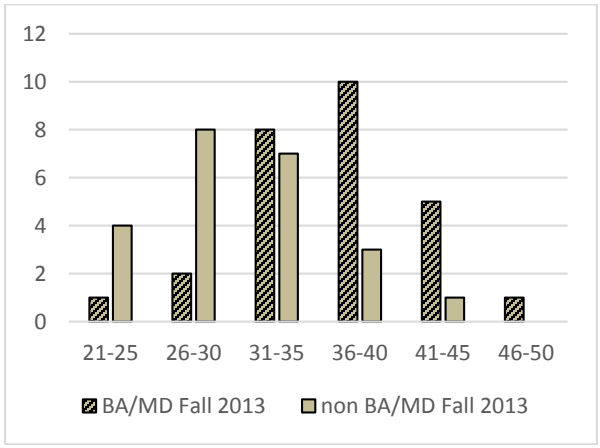
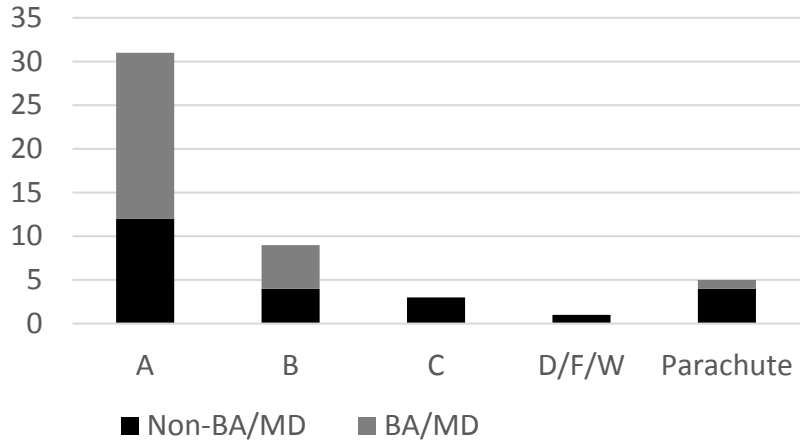


Figure A2: Grade distribution by student population for the small section of CHEM 121, Fall 2012

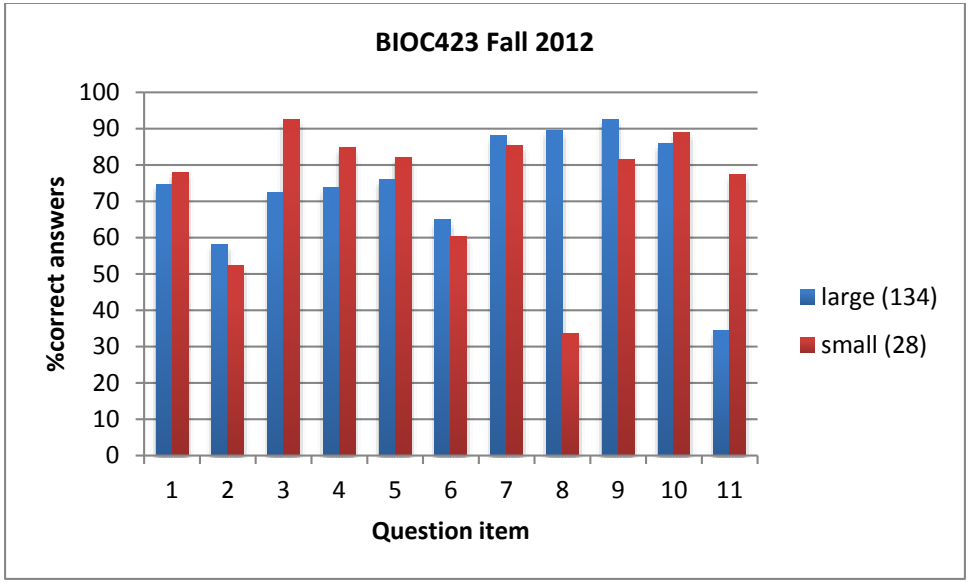


Detailed assessment for BIOC 423

Table 2A2: Comparisons of mid-term and final exam grades for large and small sections of BIOC 423

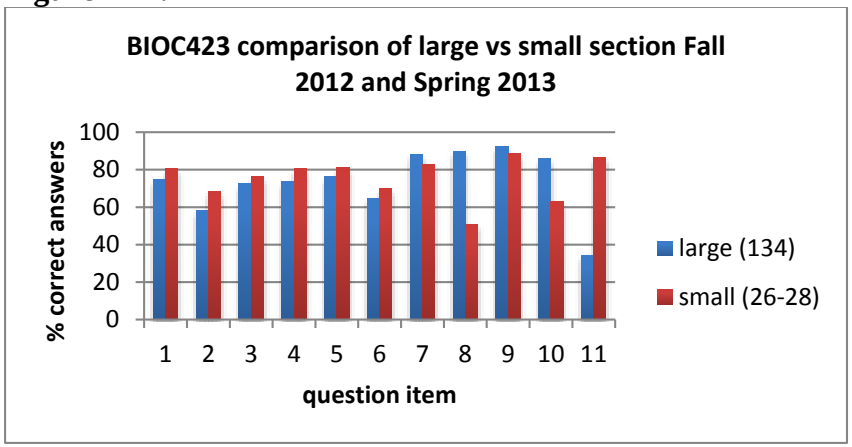
	FS12 423.001 DeHaro			FS12 423.002 Rosenberg			SS13 423.001 Bear			FS 13 423.002 Rosenberg		
	mean	median	STDdev	mean	median	STDdev	mean	median	STDdev	mean	median	STDdev
EXAM												
1	68.7	73	20	74.7	73.3	11.75	not reported			76.47	77.25	13.25
2	70.6	70	15.2	76.12	73.4	14.08				77.34	77	7.38
3	72.2	74	20.9	66.73	66.67	17.77				x	x	x
final	71.05	72.5	26.5	77.04	80	15				77.88	78	11.44
	cumulative			cumulative			not cumulative			cumulative		

Figure 2A3: The percent of correct answers of *selected* test items in the end-of semester examination, selected because they were re-used in the final of spring semester 2013.



There was little difference between the two sections when limited to this selection. Based on percentages, students in the smaller class answered a higher number of items correctly than students in the large class. The margin is small, 6 out of 11 questions. The result for the pooled data of 423.002 of both semesters vs. 423.001 for spring 2012 is shown in figure 2A4.

Figure 2A4:

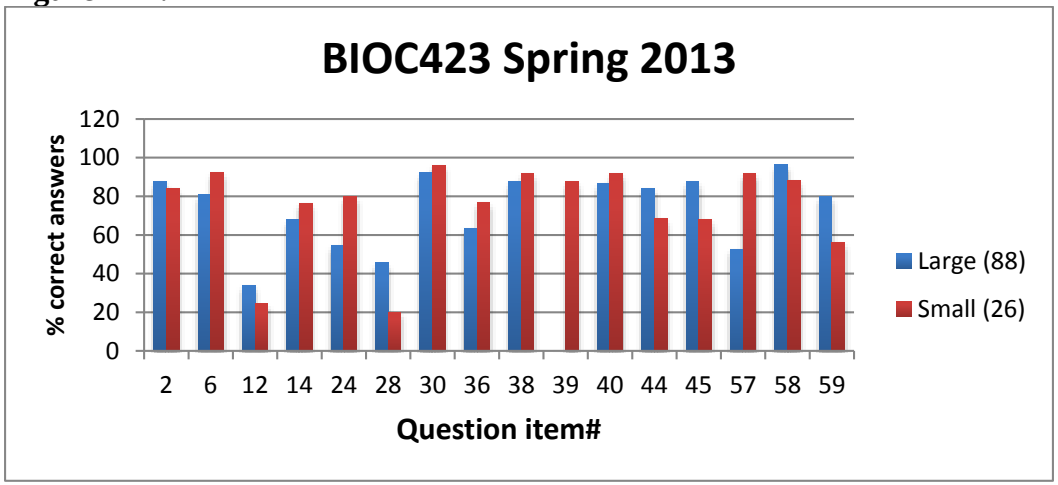


When looking at the same 11 questions and combining the results for the two small sections (fall 2012 and spring 2013) the data show that in 7 out of 11 cases the percentage of students that had the correct answer in the smaller class was higher.

In the spring of 2013 the large section was taught a by a different instructor. Although this was the first time for him to teach this particular class, he brought a vast experience of teaching Biochemistry in various settings, including Intensive Biochemistry (BIOC445/446). The courses were not aligned, other than using the same book, which was different from fall 2012. The sequence of the topics, the presentations, the format, grading scale, and the exams themselves were different between the sections. This limited the opportunities for comparison of the two sections.

However, 16 specific questions could be identified that are the same in the exams administered. It should be pointed out that the data shown in figure 4 refer to a *cumulative* end of term final for the small section compared to 3 *not-cumulative exams* spread out during the semester for the large section. These questions are all different from the ones mentioned above except question 45. This question is the same item as #4 in figure 7 (main report) (which was excluded from the fall 2012 scores) and # 8 in figures 2A3 and 2A4.

Figure 2A4:



Question 39 was excluded from the exam of the large section. For 9 out of 16 items a higher percentage of students in the smaller course gave the correct answer. Although again, the difference in the percentage of students is not very pronounced for many test items and the small section did have too few students to equate the outcome with significance. Given the differences in the format and grading in both classes a comparison of means in the exams could not be done.

Conclusions

Although these preliminary data do not allow for a definitive statement on the success rate of the two sections, students in the smaller section may do slightly better. In the item-by-item comparison of the final in the fall of 2012 a greater proportion of students in the smaller section answer correctly; in 77% of the questions. Contributing to the success of their learning outcome could be that they spent more time on task in class in dealing with some of the material and were strongly encouraged to continue to work in groups outside of class time.

However, this trend cannot be generalized yet, because so far data for only a limited number of students in only one single assessment were evaluated. Other factors could be influencing the results. For example, the bimodal grade distribution (very high achieving students vs. struggling students) not only in the final, but also in the three exams, is pointing to an unusual composition of the student population in the small section; whereas the large section displays a normal grade distribution curve.

Detailed assessment for Organic Chemistry:

Assessment of student performance on specific questions for each course in Fall 2013 and Spring 2014 does not indicate a huge difference between the two sections (Table 2A3). Both routinely struggle with the same difficult questions and do well on the easier questions. With the exception of problems where students propose the synthesis of an organic compound without the aid of boxes, they achieved satisfactory (70%) or higher in each student learning objective.

Table 2A3: Assessment of specific questions on Organic Chemistry Exams by section.

Chem 302 Section 4 Spring 2014							
Data for 46 Students	Hour Exam I, Prob 1 (13)	Hour Exam I, Prob 8 (11)	Hour Exam II, Prob 1 (25)	Hour Exam II, Prob 6 (11)	Hour Exam III, Prob 5 (10)	Hour Exam III, Prob 7 (12)	Hour Exam IV, Prob 3 (10)
SLO	Interpret NMR	Interpret NMR	Synthesis boxes	Synthesis no boxes	Synthesis no boxes	Synthesis boxes	Synthesis boxes
Average	12	10	23	6	5	6	8
Median	13	11	24	7	5	6	10
	12-13 = outstanding	10-11 = outstanding	22-25 = outstanding	10-11 = outstanding	10 = outstanding	12 = outstanding	10 = outstanding
Whalen scale**	11 = good	9 = good	19-22 = good	9 = good	8-9 = good	10-11 = good	8-9 = good
** = satisfactory = 70%	10 = satisfactory	8 = satisfactory	18 = satisfactory	8 = satisfactory	7 = satisfactory	9 = satisfactory	7 = satisfactory
	outstanding	outstanding	outstanding	less than satisfactory	less than satisfactory	less than satisfactory	good
Chem 302 Section 1 Spring 2014	12	9	20	6	7	4	8
Data for 122 Students	13	9	22	5	7	3	8
Average	12-13 = outstanding	10-11 = outstanding	22-25 = outstanding	10-11 = outstanding	10 = outstanding	12 = outstanding	10 = outstanding
Median	11 = good	9 = good	19-22 = good	9 = good	8-9 = good	10-11 = good	8-9 = good
	10 = satisfactory	8 = satisfactory	18 = satisfactory	8 = satisfactory	7 = satisfactory	9 = satisfactory	7 = satisfactory
	outstanding	good	good	less than satisfactory	satisfactory	less than satisfactory	good
Chemistry 301 Section 5 Fall 2013	Exam I, Prob 7 (10)	Exam I, Prob 8 (9)	Exam II, Prob 2 (22)	Exam II, Prob 4 (40)	Exam III, Prob 2,3 (14)	Exam IV, Prob 3 (16)	
Data for 47 students	Manipulate in 2D	Manipulate in 2D	Manipulate in 2D	Reactivity of unknowns	Reactivity of unknowns	Structure determination - IR	
SLO							
	9	7	21	29	12	13	
Average	10	8	22	30	12	12	
Median							
	9-10 = outstanding	9 = outstanding	20-22 = outstanding	35-40 = outstanding	13-14 = outstanding	15-16 = outstanding	
Whalen scale**	8 = good	8 = good	17-19 = good	29-34 = good	11-12 = good	13-14 = good	
** = satisfactory = 70%	7 = satisfactory	7 = satisfactory	16 = satisfactory	28 = satisfactory	10 = satisfactory	12 = satisfactory	
	outstanding	satisfactory	outstanding	good	good	good	
Chemistry 301 Section 7 Fall 2013	9	7	21	29	10	13	
Data for 109 Students	10	8	22	30	12	16	
Average	9-10 = outstanding	9 = outstanding	20-22 = outstanding	35-40 = outstanding	13-14 = outstanding	15-16 = outstanding	
Median	8 = good	8 = good	17-19 = good	29-34 = good	11-12 = good	13-14 = good	
	7 = satisfactory	7 = satisfactory	16 = satisfactory	28 = satisfactory	10 = satisfactory	12 = satisfactory	
Whalen scale**							
** = satisfactory = 70%	outstanding	satisfactory	outstanding	good	satisfactory	good	