Graduate Studies & Postdoctoral Education

Paving the Path for Excellence in Health Science Research Training

Annual Report 2016 – 2017
It is my pleasure to present to you the 2016-2017 annual report of the exciting advancements made through UNMC’s Graduate Studies and Postdoctoral Education programs. We are proud to continue our trend in rising year-to-year enrollment and facilitation of the growing number of opportunities presented in health science fields.

Our graduate students, postdocs, and faculty have consistently raised the bar, excelling in creative research and dedicated scholarship, with a great number honored through awards, accolades, fellowships, and publications.

This was a year of pushing our capabilities to the limit and beyond, creating extensive opportunities for professional growth, while also maintaining a consistent caliber of programs and services. We have made strong allies in Purdue Pharma and furthered our relationship with the government in USAMRIID.

We are also honored to be able to wish Dr. Jim Turpen a very happy retirement. He has been an excellent colleague and a great asset to UNMC during his tenure here. His many talents, such as leading the INBRE program through several renewals, while also serving major roles in Academic Affairs and Graduate Studies will be missed. His ability to multitask was exemplified by his successful leadership of our recent campus-wide accreditation process.

UNMC is looking to the future, where plans are already taking shape. Programs are evolving with an eye toward collaboration, new events and skills-based seminars are bringing personal development to the forefront, and prestigious opportunities give further incentive for students to continue being the top in the nation.

We have succeeded in keeping one eye on giving our talented students and postdocs the best opportunities in the country, and the other on paving an exciting path to the future.

Join us in looking back at the accomplishments we have made and the foundations we have built in this year’s report.
Leadership: Leaders, Council Members & Staff

H. Dele Davies, MD, MS, MHCM
Vice Chancellor, Academic Affairs
Dean, Graduate Studies

James B. Turpen, PhD
Associate Vice Chancellor, Academic Affairs
Executive Associate Dean, Graduate Studies

Iqbal Ahmad, PhD
Associate Dean, Postdoctoral Education & Research, Graduate Studies

Pamela K. Carmines, PhD
Assistant Dean, Graduate Studies

Terri A. Vadovski
Director, Graduate Studies

Graduate Council Members
The Graduate Council is composed of graduate program directors and members of the Graduate Studies staff. The Council, in conjunction with the Dean, is responsible for Graduate College activities at UNMC.

Chandran Achutan, PhD
Environmental Health, Occupational Health & Toxicology

Rebecca R. Anderson, JD, MS, CGC
Health Promotion & Disease Prevention Research

Keshore R. Bidasee, PhD
IGPBS Neuroscience

Laura D. Bilek, PhD
Medical Sciences Interdepartmental Areas (MSIA)

Pamela K. Carmines, PhD
Cellular & Integrative Physiology
Office of Graduate Studies

Kaustubh Datta, PhD
IGPBS Biochemistry & Molecular Biology

H. Dele Davies, MD, MS, MHCM
Office of Graduate Studies

Andrew T. Dudley, PhD
IGPBS Molecular Genetics & Cell Biology

Jered C. Garrison, PhD
Pharmaceutical Sciences

Karen A. Gould, PhD
Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS)
Medical Anatomy

Kathleen M. Hanna, PhD
Nursing

Gleb Haynatzki, PhD
Biostatistics

Kayla B. Heavican
Graduate Student Association President

James C. McClay, MD
Biomedical Informatics

Sharon Medcalf, PhD
Emergency Preparedness

Joyce C. Solheim, PhD
IGPBS Cancer Research

James B. Turpen, PhD
Office of Graduate Studies

Shinobu Watanabe-Galloway, PhD
Epidemiology

Luis A. Marky, PhD
Pharmaceutical Sciences

Rakesh K. Singh, PhD
IGPBS Immunology, Pathology & Infectious Disease

Matthew C. Zimmerman, PhD
IGPBS Integrative Physiology & Molecular Medicine

Postdoctoral Education Advisory Council
The Postdoctoral Education Advisory Council (PEAC) examines issues related to postdoctoral education at UNMC and provides guidance in matters related to training and recruitment.

Iqbal Ahmad, PhD – Chair
Ophthalmology & Visual Sciences

Kaustubh Datta, PhD
Biochemistry & Molecular Biology

Terrence M. Donohue, PhD
Internal Medicine

Casey Gries, PhD
Postdoc Research Associate, Pathology & Microbiology

Bryan T. Hackfort, PhD
Postdoc Research Associate, Cellular & Integrative Physiology

Keith R. Johnson, PhD
Oral Biology

Luis A. Marky, PhD
Pharmaceutical Sciences

Kaushik P. Patel, PhD
Cellular & Integrative Physiology

Rakesh K. Singh, PhD
Pathology & Microbiology

Staff
Cody Phillips
Associate, Graduate Studies
The most insightful advice I have ever received as an educator and administrator came recently from Jim — ‘Always begin on the side of the student — and then consider any other relevant information.’

This is a wonderful approach to resolving all kinds of problems, and I am certain that it has been an underlying tenet through all of Jim’s involvement in graduate education and academic affairs.

James B. Turpen, PhD
Associate Vice Chancellor
Academic Affairs

“The students – that’s what draws us to higher education.”

James B. Turpen, PhD

After 34 years at the university, James B. Turpen, PhD, decided it was the right time to retire. At the end of 2017, he left UNMC as a legendary figure whose accolades and achievements will remain in the minds of many.

Even with his proud accomplishments for UNMC and his pioneering work in research enterprises, Dr. Turpen’s efforts have never wavered from his primary focus — students.

His work goes to prove it. Since its introduction in 2001, Dr. Turpen has been the principal investigator on the second largest research grant in UNMC history, the INBRE Grant.

His mission for the grant? To “grow” more students who want to make research their career.

He found these students in Nebraska’s undergraduate colleges and universities. The students learned about research by being assigned to investigators at UNMC, Creighton University, and the University of Nebraska-Lincoln. Currently, nine Nebraska schools are participating in the program.

In his departure, he leaves behind his roles as an Associate Vice Chancellor for Academic Affairs and Executive Associate Dean for Graduate Studies. To fill this void, Rowen K. Zetterman, MD, Kendra K. Schmid, PhD, and Pamela K. Carmines, PhD, will step into new roles for Academic Affairs and Graduate Studies.

“The new leadership team is an excellent group of people working together,” Dr. Zetterman said. “It also shows you how big a role Dr. Turpen had.”

Dr. Turpen’s Plans for the Future

At age 72, Dr. Turpen will be giving out smiles instead of research opportunities by continuing his 21-year gig as a clown for the Shriners and entering his second year as chair of the Shrine Circus in the Omaha area. He also hopes to join the Roadrunners group that drives families to the Shriners Hospital for Children in Minneapolis.
In August of 2016, UNMC and Purdue Pharma L.P. entered a partnership to advance graduate education and scientific research that could lead to new drug therapies for patients. Part of this partnership is the Purdue Pharma Scholars, a program that provides funding for UNMC graduate students conducting neuroscience, pharmaceutical science, or pain research.

Up to three students are chosen each year to receive funding for one-year graduate assistantships, as well as an additional scholarship of up to $10,000, half paid immediately and the rest paid when the student successfully competes for a national fellowship award (federal or national-society funding).

The scholars will have access to research facilities at Purdue Pharma during the year, with travel expenses paid by Purdue Pharma. Purdue Pharma research personnel also will visit with the scholars on the UNMC campus at least once a year. Scholars will present their research at upcoming Purdue-UNMC Neuroscience Research Conferences, held annually at UNMC’s Omaha campus.

“Collaborations between industry and academia are important to drive innovation for patients suffering from pain and other chronic diseases,” he said. “Our team is continually working to understand the pathophysiology of these diseases so that we can identify new ways to develop and investigate potential therapies. Working with an institution with the research experience and capabilities of UNMC will enhance our ability to accomplish this important goal.”

Vice Chancellor for Research Jennifer L. Larsen, MD, expanded upon the benefits of the partnership.

“Having more and deeper partnerships with industry is critical to helping our investigators understand and commercialize their intellectual property as well as help our investigators identify trainees who might be interested and prepared for job opportunities in the commercial sector,” she explained.

To date, five PhD students have been selected as Purdue Pharma Scholars and applications are now being accepted for the third cohort of award winners.

About the Purdue Pharma Partnership

The Purdue Pharma partnership with UNMC promotes, develops, and expands research and educational exchange in the field of neuroscience. A primary goal has been to close the gap between academic research and drug development by shortening the lengthy path of drug development from idea to potential commercialization.
About the Postdoctoral Excellence in Research Award

The Postdoctoral Excellence in Research Award recognizes postdocs for their research accomplishments through the presentation of a certificate and a cash award. The recipients give an oral presentation attended by their peers and graduate faculty. Postdoctoral Education has presented the award since 2015.

Postdoctoral Education honored Pooja Teotia, PhD, a postdoc research associate with the Department of Ophthalmology and Visual Sciences, with its Postdoctoral Excellence in Research Award.

“Winning this award is a recognition and appreciation for me amongst successful researchers and has motivated me to continue on the right path with excellency,” Dr. Teotia said.

Dr. Teotia joined the lab of Iqbal Ahmad, PhD, in 2014 after completing her graduate degree in Life Sciences at the All India Institute of Medical Sciences – New Delhi. She was drawn to the possibilities made available through the university.

“UNMC offers extensive opportunities for the researchers, is well funded from external sources, and is equipped with multimillion dollar research facilities required for constant growth. UNMC is a great place to work,” Dr. Teotia explained.

Dr. Ahmad praised the work of Dr. Teotia, saying, “She came to my lab with no prior knowledge of retinal stem cell biology or retinal development. She mastered the concepts of the field and learned all techniques in record time. Not only that, she acquired and introduced new techniques in the lab.”

Dr. Teotia believes the award to be a great motivator for fellow researchers. “Awards for the excellent research at the scientific interface will boost postdocs’ enthusiasm toward creativity and new inventions,” she said.

Arpita Chatterjee, PhD, a postdoc in the Department of Biochemistry & Molecular Biology, was runner-up. She joined the lab of Rebecca Oberley Deegan, PhD, and continues to demonstrate her abilities, bringing further pride to the department.

“Already Arpita has been a co-author on one paper and is in the process of writing a first author publication,” Dr. Deegan said. “She has proven to be an independent thinker and a very intelligent and curious postdoctoral fellow.”

This sentiment about the value and talent of postdocs to UNMC was echoed by Dr. Ahmad, who is also the Director of Postdoctoral Education and Research.

“Our postdocs are one of the main reasons for the success of our research enterprise,” praised Dr. Ahmad. “This year’s winner and runner-up exemplify the excellence in research due to dedication and inventive approaches. These awards have been a good predictor of timely transition to independent careers.”

The awardees were recognized at the Postdoctoral Annual Event and Awards Ceremony, which is held every fall.

Praise for Dr. Arpita Chatterjee
Runner-Up Award Winner

“Every project that Arpita has been asked to do, she has excelled. We are extremely lucky to have her as a member of our department.”

Dr. Rebecca Oberley Deegan
MSIA Condensing for Better Collaborative Opportunities

The MSIA program is intended to allow students and their mentors to pursue individually designed programs of an interdisciplinary nature. However, with separate sub-plans in 21 different academic units, collaboration and engagement was actually decreasing, faculty found. Students in sub-plans with only one or two students tended to feel isolated and disengaged, without a cohort to call their own.

To increase student engagement and interdisciplinary collaboration, the existing 21 sub-plans will be condensed to six in spring 2018. This restructure will still allow individual design for newly admitted students going forward. (See page 32 for additional details.)

“The restructured program is more cohesive and allows for students doing similar research to have similar courses, seminars, and other shared learning activities,” explained Laura D. Bilek, PhD, who co-chairs the MSIA program with David H. Shaw, PhD.

IGPBS Students Provided with Government Research Opportunities

The Nebraska University system is creating the governmental scientists of tomorrow. A new partnership program has arisen between UNO and UNMC, called the Bioinformatics Research Education Pipeline (BREP). The coalition is designed to train prospective scientists for the US Army Medical Research Institute of Infectious Diseases (USAMRIID) center in Maryland, specifically in bioinformatics. The science uses the latest technology for DNA sequencing to study disease outbreaks, immune responses, viruses, bacteria and more.

UNMC has been shaping the exact kind of talent that USAMRIID is looking to recruit, thanks to the recently restructured IGPBS program — curriculum dedicated to biomedical research.

Matthew Martens, a PhD student who was one of the first to intern at the Maryland base, praised the opportunity.

“It’s a very different experience than something you would get anywhere else. Having the chance to work for the government and try something new was an amazing experience,” Martens said.

Individualized Learning through the Master’s Degree in Medical Anatomy

The MS in Medical Anatomy program is a pre-professional Master’s program that is designed to better prepare individuals aspiring to health science careers.

The program consists of 24 credit hours of courses that include whole-body anatomical dissection, systems-based histology, neuroanatomy, and cross-sectional anatomy. Students also complete coursework that gives opportunities to shadow clinicians and researchers, teaches how to critically evaluate clinical research papers, and incorporates weekly seminars given by health professionals.

“The MS in Medical Anatomy program has proven to be a powerful stepping stone for students who are on the path to professional or graduate school. In addition to providing the students with the foundational knowledge they need for that next step, the MS in Medical Anatomy program also gives students confidence in their ability to succeed in professional and graduate school,” said Karen A. Gould, PhD, who chairs the program.

44 students have graduated from the MS in Medical Anatomy program, as of August 2017

87% of the students who completed the program in 2015 and 2016 were admitted into professional school or graduate school.

71% of the MS in Medical Anatomy program graduates currently in professional or graduate school are enrolled in UNMC programs.

UNMC and UNO Students Trained at USAMRIID

Maggie Bartlett, Matthew Martens, Austin Sanford, and Tom Schulze
Gaining Perspective with the Lab Management Seminar Series

Based on a Postdoctoral Education survey, how to manage a lab was one of the highest-rated topics of interest among UNMC postdocs. To address this need, Postdoctoral Education organized a seminar series on lab management from four different perspectives:

- A department chair
- An established woman scientist
- Young independent investigators
- An established investigator with long-term experience in training postdocs

The highlight of the series was “The Pathway to a Tenure Track Faculty Position,” jointly given by Shannon M. Buckley, PhD, and Gargi Ghosal, PhD. In the talk, they discussed their experiences in starting a new lab and managing it, while giving valuable tips on preparing for an independent career.

The series was rounded up by Iqbal Ahmad, PhD, who detailed how to navigate through the mental and emotional challenges of managing a lab, productively and peacefully.

Providing a Process with the Effective Writing Strategies Seminar

Postdoctoral Education organized the “Six Parts of Speech in Nine Weeks” workshop to help postdocs hone their skills in writing effective manuscripts and grant applications. The workshop was conducted by Adrian E. Koesters, MFA, PhD, Research Editor at UNMC.

What set the program apart from other writing seminars was its course of action — learn to write for the audience instead of simply writing the content itself.

“Written work has many different readers, so even if the content remains the same, the way that content is expressed and directed is crucial,” Dr. Koesters explained.

The inaugural program was highly successful, based on attendance and universally positive evaluations.

“All participants found the course to be useful and believed the information was presented in a helpful and understandable way,” said Dr. Ahmad. “Attendees valued learning about the broader scope of writing.”

Based on the high success of the seminar, Postdoctoral Education plans on offering it again in spring 2018.

Lab Management Seminar Presentations

The Ups and Downs of Chairing a Basic Science Department
Irving H. Zucker, PhD
Cellular & Integrative Physiology

Breaking the Glass Ceiling: Are We There Yet?
Shilpa Buch, PhD
Pharmacology & Experimental Neuroscience

The Pathway to a Tenure Track Faculty Position
Shannon M. Buckley, PhD & Gargi Ghosal, PhD
Genetics, Cell Biology & Anatomy

The Zen of Running a Lab: Seven Principles for Research Nirvana
Iqbal Ahmad, PhD
Ophthalmology & Visual Sciences

Writing Seminar Attendee Comments

"The course was well structured, with pertinent topics. I was already able to apply the grammar concepts that were discussed in the course in grants and manuscript writing."

"Most seminars/workshops around campus usually focus on grant writing. I was really pleased because we need to know what to write in a grant, but equally important is the how."
A Year of Successful Events: Laying the Groundwork for Career Development

UNMC has placed a focus on professional development programs, seminars, and group meetings that will sharpen the skills of both students and faculty. This year welcomed a variety of new opportunities for learning and improvement.

Dissertation Boot Camp

Held two times a year, Dissertation Boot Camp is designed to help PhD candidates overcome writing obstacles with tips and strategies for completing a dissertation.

- 34 students have completed the boot camp, with one of those students completing it twice.
- Almost half have successfully defended their dissertations.
- These students graduate an average of 4.7 years after matriculation — 4 months faster than average.

Boot Camp attendees typically graduate 4 months faster than other students in their respective program.

Fireside Chats

The purpose of this new series is to give the students a chance to interact closely with someone who has been successful outside of academia, but with a science-based background and in a science-based career.

- Attendance is capped at about 20 students.
- The small setting ensures attendees will have time to personally interact with the speaker.
- The informal nature makes students feel comfortable enough to be involved in the discussion.

Professional Development Lunch & Learn Series

The seminars focus on career development, communication, critical thinking, and organizational skills and are designed to promote development of "soft skills" that are critical for success in virtually every career track.

- On average, 59 trainees attended each event.
- 56% of participants attended 2 or more events.
- Attendance has increased nearly 2.5 times since the 2015-2016 academic year.

"We are thrilled that these events are now drawing strong interest from the students, with attendance routinely reaching the venue’s capacity," says Pamela K. Carmines, PhD.

Networking Becomes Key Focus

Graduate Studies has partnered with Bio Nebraska to sponsor a series of Bio Networking events intended to make students aware of potential careers following graduation.

The events help students ease into networking and provide an opportunity for making new connections with leading life sciences organizations.

- Inaugural event brought together 7 companies and 25 students.
- The event sold out shortly after registration opened.

"The Bio Networking provided a terrific platform for student/business engagement and we look forward to building on the success of the inaugural event. There are exceptional students graduating from UNMC, and it's important for them to be aware of professional opportunities at innovative companies in Nebraska."

Phil Kozera
Executive Director at Bio Nebraska
Planning for the Road Ahead:  
A Look at 2018 and Beyond

The future is bright, with the 2017–2018 academic year on track to be just as exciting as the previous year. Graduate Studies and Postdoctoral Education are working to launch new programs, initiatives, and developments to help students and postdocs attain career goals.

Spotlight on Assessment

With the appointment of Kendra K. Schmid, PhD, as the campus-wide Director of Assessment and Assistant Dean for Graduate Studies, Graduate Studies is poised to evaluate and update its assessment strategies. To assist with the restructure, five committees have been formed:

- College-Level Assessment Committee
- Program-Level Assessment Committee
- Course-Level Assessment Committee
- Comprehensive Exam Committee
- Data and Metrics Committee

Consisting of roughly 40 faculty and staff members, these committees will assist in creating a robust, methodical process for assessment that offers more consistency across programs when evaluating the competency of learners. By July 2020, every graduate program will have fully implemented a comprehensive assessment plan that meets certain universal core competencies and co-curricular competencies.

Council of Graduate School Survey

UNMC will be participating in a national program that intends to survey PhD students and alumni regarding their career paths after graduation. Approximately 60 universities are involved in the survey, representing a variety of disciplines, including the health sciences. All data will be available in 2020.

Graduate Studies intends to utilize the data gathered from the survey to determine the viable careers its students enter and analyze if UNMC needs to update curriculum to better fit the qualifications for those careers.

Postdoc Surveys

Postdoctoral Education is planning to conduct two surveys in the coming months.

The first is a general survey of postdocs and their mentors regarding their experience of postdoctoral training at UNMC. Those surveyed will be asked to identify UNMC’s strengths and weaknesses. Their input for improvement will also be solicited. The goal of the survey is to assist Postdoctoral Education in evaluating its programs and services to better fit the needs of postdocs and faculty.

The second is a survey of postdocs’ contributions toward UNMC’s mission to excel in biomedical research and discoveries. This survey is intended to measure the impact of postdocs at UNMC.

Emphasis on Networking

The ability to effectively network is pivotal to job advancement. However, it is a skill that many struggle with. To assist graduate students in strengthening their networks, a series of events focused on networking are scheduled.

Students will learn from experts in the field the key items they need to master. They will also get the opportunity to utilize those skills in events with Bio Nebraska, where they can interact with potential employers.
Celebrating High Achievers with Honors & Awards

2016 – 2017 New Graduate Students of Distinction

Recognition as a Graduate Student of Distinction is reserved for students who received: a fellowship open to national/international candidates; an award based on presentation of research results at a national meeting; an appointment to a national scientific society or professional association standing committee; or a similar accomplishment.

Carter J. Barger  
PhD Candidate  
Cancer Research  
Honor:  
NIH National Cancer Institute Predoctoral to Postdoctoral Fellow Transition Award

Megan E. Bosch  
PhD Candidate  
Pharmacology & Experimental Neuroscience  
Honor:  
American Heart Association Predoctoral Fellowship

Songita Choudhury  
PhD Candidate  
Cellular & Integrative Physiology  
Honor:  
NIH Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship

Beth K. Clymer  
PhD Candidate  
Cancer Research  
Honor:  
NIH Ruth L. Kirschstein National Research Service Award Individual Predoctoral MD/PhD Fellowship

Tyler A. Herek  
PhD Student  
Cancer Research  
Honor:  
NSF Graduate Research Fellowship

Daniel R. Mitteer  
PhD Candidate  
MSIA — Applied Behavior Analysis  
Honor:  
Innovative Student Research Dissertation Grant — Society for the Advancement of Behavior Analysis

William M. Payne  
PhD Student  
Pharmaceutical Sciences  
Honor:  
Blue Waters Graduate Fellowship

Alex I. Wiesman  
PhD Student  
IGPBS — Neuroscience  
Honor:  
NIH Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship

Megan E. Bosch  
PhD Candidate  
Pharmacology & Experimental Neuroscience  
Honor:  
American Heart Association Predoctoral Fellowship

Beth K. Clymer  
PhD Candidate  
Cancer Research  
Honor:  
NIH Ruth L. Kirschstein National Research Service Award Individual Predoctoral MD/PhD Fellowship

Duy Minh Ha, PhD  
Cellular & Integrative Physiology  
Praesto Award:  
Given to the most outstanding or exceptional graduate for the academic year

Seema Chugh, PhD  
Biochemistry & Molecular Biology  
Thomas Jefferson Ingenuity Award:  
Given to a graduate student for unmatched creativity and ingenuity in doctoral research

Polina V. Shcherbakova, PhD  
Eppley Cancer Institute  
Graduate Student Association’s Distinguished Graduate Mentor Award:  
Given to a faculty member for exemplary support in developing graduate students

Graduate Studies Convocation Awards

Pooja Teotia, PhD  
Ophthalmology & Visual Sciences  
Excellence in Research Award:  
Recognizes postdocs for their research accomplishments through an oral presentation

Arpita Chatterjee, PhD  
Biochemistry & Molecular Biology  
Excellence in Research Award Runner-Up:  
Recognizes postdocs for their research accomplishments through an oral presentation

Postdoctoral Education Awards
Graduate Studies Enrollment

**476 Students Enrolled in 2017**

In 2016-2017, **106 students earned degrees** through Graduate Studies.

**66% PhD, 34% MS**

**Graduate Students by Gender**

- Male: 44%
- Female: 56%

UNMC Graduate Studies Fellowship Applications

UNMC offers several two-year fellowships to graduate students selected during an annual competition.

**Number of Postdoctoral Scholars**

- **143 Postdoctoral Scholars** enrolled in 2017. That’s a 45% increase over the past 4 years.

**Postdoctoral Fellowship Awards**

Two postdoctoral fellows were sponsored with **$90,773** from the National Institutes of Health (NIH), one for a Ruth L. Kirschstein National Research Service Awards (NRSA) Individual Postdoctoral Fellows Award (F32) and one for a National Cancer Institute (NCI) Predoctoral to Postdoctoral Fellow Transition Award (F99). Two fellows were sponsored with **$102,550** awarded as American Heart Association (AHA) Postdoctoral Fellowships. One fellow was awarded **$50,316** from the American Association of Immunologists (AAI).

**Total Dollar Value**

The total value of all postdoctoral fellowship awards was **$243,639**.
UNMC Has a Strong Influence on Postdoc Career Paths

After leaving their postdoctoral position at UNMC, scholars chose career paths including:

- UNMC faculty
- Academia
- Other UNMC positions

Graduate Students by Residency

- 38% of students are US Citizens
- 36% of students are foreign students
- 26% of students are permanent residents

Graduate Program Information

Individual Programs

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<tr>
<th>Program</th>
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Umbrella Programs

- Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS) | MS | ✔ |
- Medical Sciences Interdepartmental Area (MSIA) | ✔ |

Graduate Studies Program Information

- 38% of students are US Citizens
- 36% of students are foreign students
- 26% of students are permanent residents
Biochemistry & Molecular Biology

The goal of the Biochemistry & Molecular Biology graduate program is to prepare students for successful careers as future scientists and educators. The Department of Biochemistry & Molecular Biology offers programs of graduate study leading to MS and PhD degrees. The MS program is designed to provide a background in analytical and experimental biochemistry and includes with or without Master thesis. The MS program may increase the likelihood of acceptance into medical school or industry. The PhD program is designed to provide a more comprehensive knowledge of the biochemistry and molecular biology of living organisms and includes the research and training experience necessary for the development of independent investigators.

Currently 41 students are in the PhD program (17 of which belong to the GPBPS program), and includes 10 new students this year. Students have been highly successful in obtaining UNMC fellowships and regional and national awards.

The Biochemistry & Molecular Biology Department started an annual research symposium to highlight all of the outstanding research being performed in the graduate program. Knowing students work incredibly hard, at the symposium the department recognizes the student nominee for the Thomas Jefferson Ingenuity Award, the third-year student who had an Outstanding Performance in the Comprehensive Examination, the first-year student with the Highest Grade Point Average, and students receiving awards at the Midwest Student Biomedical Research Forum and at the Annual Research Symposium for Best Oral and Poster Presentations.

Biomedical Informatics

The University of Nebraska Joint Biomedical Informatics (BMI) graduate program’s mission is to develop the next generation of biomedical informaticians who will advance research and practice in contemporary information and knowledge management using innovative evidence-based approaches to improve human health.

The program was approved by the Board of Regents in 2013 as a shared degree program administered by UNMC and UNO. The BMI program consolidated a number of informatics specialty tracks in other degree programs such as MSIA and the UNO CS departments into a university-wide program.

Since its inception, the BMI program has grown to include Master’s and Doctoral students in health informatics, bioinformatics, imaging informatics, and laboratory informatics. The BMI program-affiliated faculty from UNMC, UNO, and UNL colleges provide a truly interdisciplinary education experience for BMI students. This past year saw the formation of the Great Plains Clinical & Translational Research Network (gpctr.unmc.edu). The Biomedical Informatics and Cyberinfrastructure Core facility provides opportunities for BMI students to work on a number of projects in related facilities such as the BioInformatics and System Biology Core, the Clinical Research Analysis Environment, and the Laboratory Informatics program.

Biostatistics

The PhD in Biostatistics is designed to provide students with the instruction and research experience necessary to become high-quality academic faculty members, researchers, and leaders in biomedicine and public health throughout Nebraska, the country, and the world. They may also choose careers as scientists in government and private research agencies.

The curriculum design of this program is consistent with the core competencies of biostatistics and strongly emphasizes the acquisition of applied skills as well as the theoretical mathematical foundations of biostatistics.

The primary focus is in the following areas of biostatistics: clinical trials; study design; survival analysis; generalized linear models; longitudinal analysis; survey methodology; and analysis of microarray gene-expression data and other high-dimensional data.

Since its start in 2012, the program now has 10 students. PhD students in biostatistics have held graduate and teaching assistantships in the Department of Biostatistics, the Department of Pediatrics, the Swanson Center for Nutrition, and the UNO Math Department.

Cancer Research

The Cancer Research graduate program is an innovative PhD-granting program that trains future scientists to approach cancer research knowledgeably and creatively and to enter careers in which they can make lasting contributions to health in our society.

Graduate students train in state-of-the-art laboratories located in the Fred & Pamela Buffett Cancer Center building, which has advanced technology for both research and clinical care in cancer. Students in the Cancer Research graduate program obtain an in-depth understanding of the conversion of normal cells to cancer cells and the expertise to design novel methods of cancer diagnosis and treatment.

The Cancer Research graduate program is supported, in part, by a training grant from the National Cancer Institute. In addition to supporting Cancer Research students, this long-running, interdisciplinary training grant also funds the stipends of students in several other graduate programs with laboratories having a cancer-related focus.

In addition to the Cancer Research students who received National Cancer Institute training grant fellowships this year, currently several students in the Cancer Research graduate program hold individual national fellowship awards: an NIH F30 Award; a National Science Foundation Graduate Research Fellowship; a National Cancer Institute F39/K00 Predoctoral to Postdoctoral Transition Award.
Individual Program Information

Cellular & Integrative Physiology
The Cellular & Integrative Physiology (CIP) graduate program provides students with diverse training in interdisciplinary approaches ranging from the molecular level to the whole organism. The CIP PhD program provides the research and training experiences required for development of independent investigators who have career goals in academia or industry.

During the 2016-2017 academic year, three students earned the PhD in Cellular and Integrative Physiology. The CIP graduate program continues to foster the development of “citizen scholars” – students who excel not only in research and scholarly activity, but also as contributors to the community. CIP students participate in science outreach through their efforts to introduce elementary, middle, and high school students to the field of physiology through hands-on activities in the classrooms across the Omaha metropolitan area. This year, numerous CIP students participated in the American Physiological Society-supported outreach event known as Physiology Understanding Week (“PhUn Week”).

Students enrolled in CIP continue to successfully compete for extramural fellowship support, with over 65% of the students enrolled in the PhD program during this academic year having held fellowships from NIH or the American Heart Association at some point during their graduate training. This success reflects well on the efforts of faculty mentors to develop individualized training plans that suit the unique needs of each student. In accord with the concept of physiology as “the science of medicine,” the program has continued to attract future physician-scientists, with MD/PhD scholars representing approximately half of the PhD students enrolled in CIP.

Environmental Health, Occupational Health & Toxicology
The Environmental Health, Occupational Health & Toxicology graduate program provides students with the knowledge base, field and laboratory skills, and problem-solving abilities to become independent, innovative professionals using state-of-the-art approaches to address scientific problems in the fields of environmental health, ecological health, occupational health and safety, and toxicology.

The PhD program offers two educational tracks to meet the research interests of students. The tracks are: Environmental and Occupational Health, and Toxicology. Objectives are to provide students with: 1) in-depth knowledge in ecological, environmental, agricultural and occupational health, as well as toxicology; 2) a broad understanding of the relevant problems in the various areas of ecological health (effects of contaminants and practices on air, water, soil, and ecosystems), environmental health (effects of environmental contaminants and practices on human health), occupational health and safety, or toxicology, with particular emphasis on agriculture; and 3) the ability to apply this information to important scientific questions and solve problems in these areas.

The faculty conduct research in areas of environmental, agricultural and occupational health. Often their research and service activities are accomplished through multidisciplinary collaborations within and outside the College of Public Health, the UNMC campus, and the NU system. This broad approach enables them to tackle difficult issues in order to improve the health of the community, especially rural and agriculture-based communities both in Nebraska and around the world. Over 20 PhD students have graduated from this program.

Emergency Preparedness
The MS in Emergency Preparedness prepares professionals in a world where emergency preparedness and response skills are essential to the public health infrastructure, and ultimately build community resilience. Events explored include natural disasters, intentional acts of terrorism, and new infectious disease threats. The curriculum is designed to be reflective and inclusive of current and nationally endorsed competencies in emergency preparedness leadership, communication, information management, practice improvement and planning, and worker health and safety.

This program attracts students from across the nation and the globe, creating a future network of professionals to prepare for the next disaster. Students also belong to a UNMC Student Response Team and gain valuable experience in outbreak management, mass dispensing, and monitoring social media in a disaster. Research opportunities are abundant as partner organizations look to UNMC students and faculty for expertise. Current studies are underway with partners such as the American Red Cross, the American Healthcare Association, national Hospital Preparedness Program, and others.

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Epidemiology
The Epidemiology graduate program prepares practitioners and researchers for positions in government agencies, the private sector, and academia. Students learn to design, conduct, and analyze epidemiologic research studies, interpret research findings, and apply findings to solve public health problems or discover causes of diseases.

Epidemiology faculty and students conduct research on a broad range of epidemiologic topics. The areas the department emphasizes include cancer, mental health, infectious and emerging infectious diseases, viral pathogenesis, bio-preparedness, biocontainment, and clinical epidemiology.

Since its start in 2012, the program has admitted 26 students. Six of them graduated and are employed in a variety of settings including universities and public health organizations.

7 students
in the PhD program
6 graduates
from the PhD program
4 publications &
2 government reports
by students
12 conference presentations
by students
3 awards
to students
Individual Program Information

<table>
<thead>
<tr>
<th>Program</th>
<th>Awards and Achievements</th>
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<tr>
<td><strong>Genetics, Cell Biology &amp; Anatomy</strong></td>
<td>12 students in the PhD program, 16 students in the MS program, 23 publications by students, 4 UNMC fellowships awarded to students, 1 national fellowship awarded to a student</td>
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<tr>
<td><strong>Health Promotion &amp; Disease Prevention</strong></td>
<td>14 students in the PhD program, 9 publications &amp; 3 reports by students, 1 national fellowship awarded to a student, 2 competitive research grants awarded to students, 4 merit awards to students, 7 international, national, or regional presentations by students</td>
</tr>
<tr>
<td><strong>Health Services Research, Administration &amp; Policy</strong></td>
<td>16 students in the PhD program, 14 publications, book chapters &amp; policy reports by students, 4 national awards to students</td>
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The Department of Genetics, Cell Biology and Anatomy (GCBA) oversees four graduate programs in two tracks that together fulfill the joint education missions of the department to train future leaders in scientific research, medical education, and health sciences. The research track is composed of PhD and MS graduate programs that are designed to provide a comprehensive research and classroom experience in genetics and cell biology for students who wish to pursue careers as independent researchers and/or educators at the university level. The anatomy track includes the Anatomy Teaching Track Program, which trains students to teach anatomical sciences and perform biomedical research, and the Master’s in Medical Anatomy that prepares students for professional education in health science, such as medical or physical therapy school. (Results of the Master’s in Medical Anatomy are reported on page 9.)

During the 2016-2017 academic year, five students in the research track completed the PhD degree. Each of these students has moved on to a professional position, including postdoctoral positions at Northwestern University and UNMC, medical writer at Medergy Health Group, and MD/PhD scholars completing medical training. Seventeen GCBA graduate students, including these five graduates, published 22 papers and received three UNMC fellowships and a prestigious NIH F99/K00 predoctoral to postdoctoral transition award. The Anatomy Teaching Track PhD program includes five students. As a young program, only two students are past the second year of studies. Of these, one student has a publication and received a UNMC graduate fellowship.

Students in the GCBA graduate program organized and participated in the third annual student research forum. At the forum, graduate students had the opportunity to share their research with faculty and other students via oral or poster presentations.

An inspiring keynote talk by Jeff Koterba, political cartoonist of the Omaha World-Herald, addressed the challenges of overcoming obstacles, developing resilience, and maintaining creativity in life and in professional endeavors. The forum also included opportunities to network with others in the department and with new students in the Molecular Genetics & Cell Biology (MGCB) doctoral program of the Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS), which replaced the GCBA PhD program in 2017.

Finally, the GCBA graduate program continued its effort to recognize the accomplishments of students by making annual “outstanding” and “excellent” student awards; this year’s recipient of the outstanding student award was Shrabasti Roychoudhury, and the excellent student award went to Fany Iseka.

The Health Promotion & Disease Prevention (HPDP) PhD program is based in the Department of Health Promotion in the College of Public Health. The program emphasizes transdisciplinary and interprofessional training. Graduates are employed to enable populations and communities to achieve optimal health — a balance of physical, mental, and social health — through social and behavioral change and the creation of environments conducive to healthy lifestyles. Graduates are equipped to plan, implement, and evaluate health promotion and disease prevention programs and policies. An interdisciplinary approach integrates the expertise of faculty with diverse backgrounds in social and behavioral sciences.

During the 2016-2017 academic year, four students completed the PhD degree, and three PhD students joined the program.

The HPDP PhD program continues to offer research and mentorship opportunities through the Gretchen Swanson Center for Nutrition and the Center for Reducing Health Disparities. Both centers have affiliate faculty with the Department of Health Promotion. Graduate students can also seek funding from the Cancer Epidemiology Education in Special Populations (CEESP) program to support travel and conduct summer research in underserved sites or international settings.

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The Health Services Research, Administration & Policy program is offered through the Department of Health Services Research and Administration in the College of Public Health. The program educates students to be scholars and health services researchers for careers in academia as well as large corporations, insurance companies, government agencies, health care organizations, and consulting.

Fifteen students were enrolled in the program from July 2016 to August 2017, which was a great year in terms of job placement. Seven students graduated and were placed as assistant professors at the University of Minnesota-Milwaukee, Peru State College, Rhode Island College, and the University of Alabama as well as in key positions with LA-SER Analytica, the Health Policy Institute of the American Dental Association, and UNMC. Three excellent students are joining the program in Fall 2017.

The program anticipates continued success in the productivity and placement of its PhD students in the future.
Nursing

The Nursing PhD program prepares nurse scientists to be transformational leaders in the discovery of knowledge to improve health of individuals, families, and communities, and to advance the profession of nursing. The program is proud of its research strengths in the broad areas of health promotion, chronic illness management, health systems and quality improvement, education, health policy, health disparities, and rural populations.

The College of Nursing faculty guides students’ dissertation committees that focus in these areas. Curriculum is consistent with recommendations for nursing PhD programs by the American Association of College of Nursing. Full-time and part-time options are offered, with about 50% of students being full-time. Students can enter after the MSN or BSN degree. The MSN entry to PhD is designed for both FT and PT students but the BSN-PhD program is currently designed for FT students only. The College of Nursing has five campuses across the state of Nebraska – Omaha, Lincoln, Norfolk, Kearney, and Scottsbluff. Classes are held via video technology such as Adobe and use Blackboard or Canvas as a format for asynchronous discussions. About 79% of classes are synchronous and 21% asynchronous.

During the 2016-2017 academic year, there were 26 PhD students in the program with 10 graduating. Although the majority of students are from Nebraska, some students hail from California, North Dakota, South Dakota, Iowa, or Michigan. Two Nursing PhD students were awarded prestigious NRSA awards.

Pathology & Microbiology

The Pathology & Microbiology graduate program stresses molecular biological, immunological, and genetic mechanisms of disease, while intimately combining clinical and applied research with basic research interests and providing the most rigorous and inspiring training for graduate students in the areas of microbiology, pathology, immunology, host-pathogen interaction, and related fields. This diversification of research interests offers a variety of distinctive and highly individualized opportunities for graduate training. The flexibility of this graduate program accommodates a wide range of student interests and backgrounds. The learning experience is enhanced by an outstanding seminar series and journal clubs in which the most current immunology, pathology, and infectious disease research is discussed.

The graduate program involves 66 primary faculty members across campus providing a high faculty/student ratio, while promoting an excellent environment for collaborative interactions and stimulating exchanges of ideas. The program also has strong relationships with other University of Nebraska’s campuses such as UNO and UNL, which provides students with even greater opportunities for collaborative research efforts.

The graduate program supports PhD, MD, and MS level degrees. Students in the Pathology & Microbiology graduate program participate in coursework and laboratory research that will prepare them for competitively securing rewarding research and teaching careers in academic institutions, biotechnology industries, biomedical laboratories, and government agencies.

Pharmaceutical Sciences

The mission of the Pharmaceutical Sciences Graduate Program (PSGP) is to provide an integrated, multidisciplinary graduate education in pharmaceutical sciences. The PSGP provides expertise in all areas of pharmaceutical sciences, including drug discovery, drug delivery, nanomedicine, biophysics, pharmacokinetics, and drug metabolism. Current disease interests in the PSGP are diverse, but there is an emphasis on the discovery and development of new drugs and drug delivery methods for the treatment of cancer, infectious diseases, and inflammatory disorders. Students graduating from the PSGP are prepared for their future careers in basic pharmaceutical research and education, translational research, academic and industrial research and development, and government and regulatory agencies. The PSGP is one of the largest PhD programs at UNMC and the only graduate program housed within the College of Pharmacy. Currently, the college ranks sixth in National Institutes of Health funding per faculty member among all Colleges of Pharmacy in the United States.

Students are admitted into the PSGP to obtain either a Master of Science or Doctor of Philosophy degree. Two years is the expected time required to complete the MS degree whereas four to five years are usually needed to complete the requirements of the PhD degree. For each student, a program of study involving formal course work and original, state-of-the-art laboratory research is developed and approved by their Advisor/Supervisory Committee.

Pharmacology & Experimental Neuroscience

Research in the Pharmacology & Experimental Neuroscience (PEN) program is geared toward understanding the molecular and cellular mechanisms responsible for the neurodegenerative and cognitive decline in susceptible individuals, and to develop therapeutic strategies to alleviate them. New chemical entities as well as novel therapeutic formulations are under development. Research is also done in the area of pulmonary diseases. Studies are conducted using pre-clinical models and clinical trials.

PEN faculty continue to receive the bulk of their funding from the NIH, ranking in the top 10 nationwide. New educational initiatives including the development of new courses in system and basic neuroscience, humanized mouse models, and scientific writing were developed to increase interactions and instruction for students. Prospective students applying to PEN continue to have a thorough review of their applications and face-to-face interview to gauge interest. The program provides financial support that includes a stipend, tuition waiver, and health insurance. The curriculum consists of two years of coursework (a minimum of seven credited courses) and three years of research. This structure ensures intensive training in conducting and disseminating research. Students are also provided help to write and submit grant applications to internal, local, and external funding agencies for predoctoral fellowships.

Since fall 2016, graduate training is overseen by the IGPSB Neuroscience Doctoral Program housed in PEN. The new program provides more research options for students in basic and clinical labs, with curriculum tailored to help students with their research.
Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS)

The IGPBS consortium consists of six interdisciplinary doctoral programs with over 200 participating research faculty from 32 basic science and clinical departments.

Biochemistry & Molecular Biology (BMB) Doctoral Program
BMB is designed to provide a comprehensive knowledge of the biochemistry and molecular biology of living organisms and includes the research and training experience necessary for the development of independent investigators.

- 17 students in the PhD program

Cancer Research Doctoral Program
The Cancer Research Doctoral Program is offered through the Eppley Institute for Research in Cancer and Allied Diseases. This program includes basic, translational, and clinical faculty members in a large variety of departments at UNMC.

- 10 students in the PhD program
- 2 internships awarded to students
- 1 publication by a student

Immunology, Pathology & Infectious Disease (IPID) Doctoral Program
IPID combines clinical and applied research with basic research interests. Immunology research focuses on understanding immune responses as important mediators in many common disorders; infectious disease research allows students to participate in investigations of microbes and their interactions with various host systems; and molecular pathogenesis research focuses on functional genomics, cancer biology, signal transduction, and targeted therapeutics.

- 9 students in the PhD program
- 2 internships awarded to students
- 1 publication by a student

Integrative Physiology & Molecular Medicine (IPMM) Doctoral Program
IPMM provides diverse research and learning experiences that emphasize cellular and molecular processes underscoring coordinated integration of organ systems within the body, typically with a view to unraveling disease mechanisms.

- 2 students in the PhD program
- 1 national award to a student
- 1 publication by a student

Molecular Genetics & Cell Biology (MGCB) Doctoral Program
MGCB develops creative and innovative biomedical scientists through a rigorous program of classroom activities and intensive laboratory research that are founded in the fundamental of molecular genetics and cell biology. MGCB curriculum also includes programs in professional development and grant writing designed to provide students with important transferrable skills.

- 11 students in the PhD program

Neuroscience Doctoral Program
The Neuroscience Program is geared toward understanding the molecular and cellular mechanisms responsible for neuron dysregulation, cognitive decline, and cardiovascular diseases in susceptible individuals, and to develop therapeutic strategies to alleviate them. Because the Neuroscience Program is comprised of faculty from across the UNMC campus with research interests in all aspects of neuroscience, more research options are available for students in basic and clinical labs.

- 8 students in the PhD program
- 4 publications by students
- 1 UNMC fellowship awarded to a student
- 1 national fellowship awarded to a student

Medical Sciences Interdepartmental Areas (MSIA)

The 2016-2017 academic year was a milestone in the MSIA graduate program. The numerous department-based sub-plans had long recognized that students enrolled in their sub-plans were more similar than different. Identifying as “individual” units prevented faculty from sharing expertise outside their department and students from developing a collective identity.

Thus, many MSIA department-based sub-plans capitalized on the interdisciplinary history of MSIA and developed a collaborative mechanism to expand and more effectively educate MSIA graduate students.

Discipline-Specific Sub-Plans
The newly re-organized MSIA graduate program retains three focused and robust sub-plans:

- Oral Biology, housed in the College of Dentistry
- Applied Behavior Analysis, a PhD program for students entering with clinical counseling credentials
- Clinical and Translational Research Scholars Program, limited to internal UNMC faculty

Research-Focused Sub-Plans
Newly developed sub-plans are not discipline specific, but will focus on the type of research conducted:

- Clinically Relevant Basic Research: Research, processes, and methodologies affiliated with basic science studies in clinical departments that have translational relevance to the health of patients.
- Patient-Oriented Research: Research that directly involves patients, evaluating either their tissue, behavior, physiology, or responses to an intervention.
- Health Practice and Medical Education Research: Research that explores health practice, health policy, population health, or health education.

The MSIA looks forward not only to enhanced education opportunities, but to a shared sense of student community within its enrolled student population.
The extraordinary work being done by our Graduate Studies and Postdoctoral Education faculty and staff is helping lay a strong foundation to ensure UNMC students and fellows are on a solid path to success.

H. Dele Davies, MD, MS, MHCM
Vice Chancellor for Academic Affairs
Dean for Graduate Studies