UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

PSM PROFESSIONAL SCIENCE MASTER'S

PROFESSIONAL SCIENCE MASTER'S IN BIOMEDICAL SCIENCES OVERVIEW

The Professional Science Master's (PSM) program in Biomedical Sciences offers rigorous academic training and professional practical skills to prepare students for challenging careers in the biomedical and health sciences. Through advanced coursework in the natural sciences and complementary coursework in the humanities and social sciences, students gain in-depth scientific knowledge and a strong foundation in ethics, leadership, communication and global awareness. Furthermore, the students will gain awareness of the many issues, concerns, and future directions of health and biomedical sciences fields.

This multi- and inter-disciplinary program is designed to be very individualized with one-on-one advising to customize the curriculum and capstone internship in order to complement and expand on the student's past academics and experiences and to prepare them for their future career goals. The student is matched with a capstone mentor whose professional expertise aligns with the student's future career goals. The overall goal of the capstone experience is for the student to gain advanced disciplinary knowledge and professional skills by applying the appropriate modes of inquiry, research and professional skills to address a specific current problem or concern in the biomedical sciences.

The PSM program emphasizes active communication with an external Advisory Board to ensure that the curriculum and capstone experiences are relevant and beneficial to both students and the bioscience and healthcare industries. The advisory board, comprised of leaders in biomedical research, biotechnology, clinical healthcare, health institutions and hospital administration, provides input regarding the academic knowledge and skill set and professional competencies most sought by employers and graduate programs in biomedical fields. This Master's program is recognized and approved as an affiliated PSM program with the National Professional Science Association.

For more information, contact Dr. Nancy Lorenzon at Nancy.Lorenzon@du.edu or (303) 871-2871.

UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

PROFESSIONAL SCIENCE MASTER'S PROGRAM IN BIOMEDICAL SCIENCES

PROGRAM GOALS

The PSM in Biomedical Sciences program offers rigorous advanced academic training and professional practical skills in order to prepare students for challenging careers in the biomedical sciences and health sciences. The program strives to provide strong scientific knowledge and promote global-awareness, ethics, communication and other important professional skills through acquiring understanding within and across disciplines at DU. Furthermore, the students will gain awareness of the many issues, concerns, and future directions of health and biomedical sciences industries. Thus, the program will provide graduates with strong technical aptitude, professional competencies, interdisciplinary attitudes, globally-oriented prospective, and maturity.

PROFESSIONAL SCIENCE MASTER'S DEGREE

The PSM degree is a distinctive advanced degree for those intending to pursue a career in the practice of science; it differs from a coursework-only Master's degree and a research-based Master's degree. The NPSMA guidelines state that PSM programs achieve their objectives 'by combining advanced, graduate coursework in science and/or mathematics with an appropriate component of professional skills development and by including an experiential learning component appropriate to the targeted employment sector.' The professional skills components of the PSM program may include business basics, policy, law, regulatory affairs, finance, organizational behavior, ethics, communication, and teamwork (as defined by the NPSMA). In addition, the experiential learning component provides an opportunity for students to demonstrate proficiency in written and oral communication skills.

PSM IN BIOMEDICAL SCIENCES PROGRAM AT DU

The Professional Science Master of Biomedical Sciences degree is a rigorous one-year academic program. This master's degree requires 45-credit hours of course work and successful completion of the written and oral defense of a capstone project. The curriculum includes 24 credit hours of required core courses and 21 credit hours of concentration-focused elective courses. The program director will meet individually with students to create and approve an individual plan of study.

This program will serve students for whom a traditional research-based Master's degree may not be an appropriate option to advance their career endeavors or interests. Graduates from this program may enter careers in biomedical research in academia or industry, clinical research, regulatory affairs, government, or healthcare through further education in professional schools. The PSM program will function as an important bridge for students between undergraduate education and careers in health and biomedical sciences.

CAPSTONE EXPERIENCE

The capstone experience will include an externship project and a scholarly presentation of that project. The capstone project can be one that is administrative, clinical, programmatic, or research focused. Students will work with a professional from healthcare, pharmaceutical and biotech companies, or private and public health services to identify the student's specific project focus. Through the capstone experience, students will (1) gain mastery in the biomedical field by critiquing current research literature related to a specific problem or scientific question, (2) gain advanced disciplinary knowledge and professional skills by applying the appropriate modes of inquiry, research and professional skills to examine and solve a current specific problem or concern in the field of biomedical sciences, (3) integrate information across relevant disciplines in order to solve complex problems, and (4) compose an original scholarly presentation (both written and oral) that reflects a topic of current interest in the biomedical and healthcare industries, and the integration of science with strong professional skills.

PSM PROFESSIONAL ADVISORY BOARD

The program strives for active communication with several professionals outside of DU in biomedical sciences to ensure the curriculum and capstone experiences remains relevant and beneficial to both the students and the industries. The Advisory Board is comprised of 8-12 leaders in biomedical research, biotechnology, clinical healthcare, academic allied health institutions, and hospital administration. The Advisory Board guides the curriculum by providing input regarding the academic skill set and professional tools most sought by people hiring graduates for biomedical careers in industry or academia and for admission to professional schools.

For more information, contact Dr. Nancy Lorenzon at Nancy.Lorenzon@du.edu or (303) 871-2871.

UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

Professional Science Master's in Biomedical Sciences with a concentration in Clinical Exercise Physiology

The Professional Science Master's (PSM) in Biomedical Sciences program offers rigorous advanced academic training and professional practical skills in order to prepare students for challenging careers in the biomedical sciences and health sciences. The PSM in Biomedical Sciences is a rigorous one-year academic program requiring 45-credit hours of course work and successful completion of the written and oral defense of a capstone project. The concentration in Clinical Exercise Physiology provides expanding academic offerings in the area of integrative human physiology, as well as advanced knowledge of cardiovascular, pulmonary and metabolic diseases, orthopedic or musculoskeletal, neuromuscular, and neoplastic immunological or hematological diseases.

Students who enroll in the concentration in Clinical Exercise Physiology are required to complete the PSM required coursework and choose from the physiology-selected elective coursework. The physiology coursework is relatively flexible to consider the academic background of the individual student. All coursework plans will be determined in collaboration with the program director and approved by the director. For the concentration in CEP, student will complete a capstone project related to exercise physiology with a capstone mentor who specializes in a specific physiological system and/or exercise physiology. The coursework and capstone will provide knowledge and experiences to help students build the competencies for ACSM certification in Clinical Exercise Physiology.

For more information, contact Dr. Nancy Lorenzon at Nancy.Lorenzon@du.edu or (303) 871-2871.

UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

PSM PROFESSIONAL ADVISORY BOARD January 2020

The Professional Sciences Master's in Biomedical Sciences program is guided by an active Advisory Board, who offers experience, expertise and energy. The Advisory Board represents a number of different disciplines within health and biomedical sciences to ensure the curriculum and capstone experiences remains relevant and beneficial to both the students and the industries. The Board is comprised of 8-12 leaders in biomedical research, biotechnology, clinical health care, academic health institutions, and hospital administration. The Advisory Board guides the curriculum by providing input regarding the academic skill set and professional tools most sought when hiring graduates for biomedical careers in industry or academia and for admission to professional schools.

Andras Bodoni, MD, FCCP
Pulmonologist, Critical Care Physician
Colorado Pulmonary Associates, P.C.

Elena I. Bodoni, DDS
General Dentistry
Elena I. Bodoni, DDS, Greenwood Village

Holli Cherevka, MSc
Chief Operation Officer
Ampio Pharmaceuticals

Mitch Fittro
Education and Workforce Manager
Central Colorado AHEC

M**atthew Jonsen PhD, JD**
Partner, Intellectual Property
Dorsey & Whitney LLP

Denise Mathias, MBA
Administrative Director of Cardiovascular Services
Director of Volunteer Services
HealthONE| Swedish Medical Center

J. Tod Olin, MD, MSCS
Associate Professor, Division of Pulmonary Medicine
Department of Pediatrics
National Jewish Health

Peter Stevens, PhD
Chief New Ventures Officer
AlloSource

PROFESSIONAL SCIENCE MASTERS IN BIOMEDICAL SCIENCES CURRICULUM

Program Requirements

The Professional Science Master of Biomedical Sciences degree is a rigorous one-year academic program. This master's degree requires 45-credit hours of course work and successful completion of the written and oral defense of a capstone project. The curriculum includes 25 credit hours of required core courses and 20 credit hours of program-focused elective courses. Each individual student's curriculum must contain at least 50% STEM content. The program director will meet individually with students to create and approve an individual plan of study. Students can utilize the option to complete their project during the summer months (if approved by the mentor and the PSM director) through continuous enrollment (no tuition cost).

Required Courses

Fall Quarter (14-16 credits total)

BIOL 4085 Accelerated Biostatistics	(2 credits)
BIOL 4212 Advanced Molecular Biology	(3 credits)
BIOL 4310 Foundations in Literature	(2 credits)
BIOL 4870 Medical Ethics	(4 credits)
BIOL 4991 Independent Study- Capstone	(1 credit)
Elective course(s)	(2-5 credit hours)

Winter Interterm

Capstone Project Proposal Development

Winter (14-16 credits total)

BIOL 4211 Advanced Cell Biology*	(3 credits)
BIOL 4231 Responsible Conduct in Research	(1 credit)
BIOL 4310 Foundations in Literature	(2 credits)
BIOL 4980 Internship in Biomedical Sciences- Capstone	(2 credits)
Elective course(s)	(6-8 credit hours)

Spring (14-16 credits total)

BIOL 4213 Advanced Cell Signaling*	(3 credits)
BIOL 4155 Leadership in the Sciences	(1 credit)
BIOL 4880 Capstone in Biomedical Sciences	(4 credits)
Elective course(s)	(6-11 credit hours)

**Students can choose between BIOL4211 and 4213 to fulfill the core requirements (students can enroll in the additional course as an elective).*

Total of 45 credit hours and successful completion of the capstone project including a written and public oral presentation of the project.

Additional suggested elective courses:

Electives can be chosen from the approved list of existing elective courses (see next page) in consultation with the Program Director. Additional upper level (3000- or 4000-level) elective courses will be considered with approval of the Program Director.

Elective Courses

Natural Sciences

BIOL 3025 Science and the Law (2 credits)
BIOL 3110 Special Topics: Biology (2-4 credits)
BIOL 3110 Science Communication (4 credits)
BIOL 3120 General Microbiology (4 credits)
BIOL 3145 Cellular and Molecular Biology of Cancer (4 credits)
BIOL 3150 Intracellular Dynamics (4 credits)
BIOL 3160 Biophysics: Ion channels & Disease (4 credits)
BIOL 3260 Nutrition (3 credits)
BIOL 3250 Human Physiology (5 credits)
BIOL 3251 Exercise Physiology (4 credits)
BIOL 3410 Animal Behavior (4 credits)
BIOL 3560 Molecular Biology Lab (4 credits)
BIOL 3570 Proteins in Biological Membranes (4 credits)
BIOL 3610 Developmental Biology (4 credits)
BIOL 3615 Blood Vessel Development and Disease (4 credits)
BIOL 3630 Cell Biology of Development (4 credits)
BIOL 3640 Introductory Neurobiology (4 credits)
BIOL 3641 Systems Neuroscience (4 credits)
BIOL 3642 Neuropharmacology (4 credits)
BIOL 3644 Neuromuscular Pathophysiology (4 credits)
BIOL 3645 Molecular Mechanisms of Neurological Disease (4 credits)
BIOL 3647 Neuroscience of Motion (4 credits)
BIOL 3650 Endocrinology (4 credits)
BIOL 3656 Cellular Aspects of Diabetes & Obesity (4 credits)
BIOL 3670 Molecular Immunology (4 credits)
BIOL 3675 Virology (4 credits)
BIOL 3704 Advanced Topics in Cell Biology (2-4 credits)
BIOL 3708 Topics in Integrative Physiology (2-4 credits)
BIOL 3800 Human Molecular Biology (4 credits)
BIOL 3850 Genetic Engineering (4 credits)
BIOL 3910 Viruses and Infectious Human Diseases (4 credits)
BIOL 3920 Forensic Pathology (2 credits)
BIOL 4211 Advanced Cell Biology (3 credits)
BIOL 4213 Advanced Cell Signaling (3 credits)
CHEM 3130 Chemical Systems III (Biochemistry) (3 credits)
CHEM 3811 Biochemistry/ Proteins (3 credits)
CHEM 3812 Biochemistry/ Membranes and Metabolism (3 credits)
CHEM 3813 Biochemistry/ Nucleic Acids (3 credits)
CHEM 3820 Biochemistry Lab (3 credits)
CHEM 3831 Adv Protein Biochemistry (3 credits)
GEOG 3470 GIS & Environmental Health Geography (3 credits)
GEOG 3755 Geography of Health (4 credits)

Engineering

ENBI 4500 Biofluids (4 credits)
ENBI 4510 Biomechanics (4 credits)
ENBI 4520 Introduction to Cardiovascular Engineering (4 credits)
ENBI 4800 Advanced Topics: Computational Biomechanics (4 credits)

Global Health

INTS 4056 - Information Management in Human Crises (4 credits)
INTS 4362 Gender and Health (4 credits)
INTS 4367 Global Health Affairs: Theory & Practice (4 credits)
INTS 4368 HIV/AIDS in International Affairs (4 credits)
INTS 4377 Reproductive Health (4 credits)
INTS 4423 Introduction to Epidemiology (4 credits)
INTS 4435 Health and Development (4 credits)
INTS 4465 Population, Society and Development (4 credits)
INTS 4483 Practical Applications in Global Health (4 credits)
INTS 4492 Health and Humanitarian Aid (4 credits)
INTS 4516 Major Diseases in Global Health: From Pathophysiology to Action (4 credits)
INTS 4557 Cross-Cultural Communications (4 credits)
INTS 4576 Seminar in Community-Based Research (4 credits)

Social Sciences

ANTH 4320 Medical Anthropology (4 credits)

CNP 4707 Introduction to Integrated Health (3 credits)
CNP 4772 Diversity Seminar: Health Disparities (1 credit)
CNP 4778 Health Psychology (3 credits)

COMN 4020 Relational Communication (5 credits)
COMN 4110 Theories of Interpersonal Communication (5 credits)
COMN 4701 Dark Side of Relationships
COMN 4701 Work/Family Balance
COMN 4701 Communication and Privacy
COMN 4701 Communication Ethics

PSYC 4002 Proseminar in Human Memory and Cognition (5 credits)
PSYC 4011 Proseminar in Emotion (5 credits)
PSYC 4021 Proseminar in Social Psychology (5 credits)
PSYC 4031 Developmental Proseminar: Cognition & Perception (5 credits)
PSYC 4033 Developmental Proseminar: Biological (5 credits)
PSYC 4085 Stress & Health (5 credits)
PSYC 4254 Intro to Neural Network Models (5 credits)
PSYC 4255 Imaging the Mind (5 credits)
PSYC 4256 Seminar: Cognitive Neuroscience (5 credits)
PSYC 4258 Social Neuroscience (5 credits)
PSYC 4262 Affective Neuroscience (5 credits)
PSYC 4511 Proseminar in Psychopathology (5 credits)
PSYC 4525 Proseminar in Developmental Neuropsychology (5 credits)
PSYC 4526 Proseminar in Cognitive Neuroscience (5 credits)

Business

ACTG 4610 Financial Accounting and Reporting (4 credits)

FIN 4630 Managerial Finance (4 credits)

MGMT 4620 Organizational Dynamics (4 credits)
MGMT 4630 Strategic Human Resources Management (4 credits)

MKTG 4100 Marketing Concepts (4 credits)

INFO 4100 Business Intelligence, Data Warehousing, Corporate Decision Making & Leadership (4 credits)
INFO 4280 Project Management (4 credits)

Public Policy

PPOL 4100 American Public Policy System
PPOL 4400 Analytical and Critical Skills (4 credits)
PPOL 4501 Great Issues Forum (2 credits)
PPOL 4700 Public Management and Budgeting (4 credits)
PPOL 4600 Regulatory Policy and Process (4 credits)

- *Additional electives that are not listed may be taken for credit, if supportive of the PSM degree and your future career interests AND approved by the PSM Director.*

- *Students will receive a curriculum planning spreadsheet with courses offered each quarter and the days and times when each class meets. Students can choose courses outside of this list, but the course must be approved by the program director.*

PSM in Biomedical Sciences Capstone Experience

The capstone experience will include a 9-12 month internship project and scholarly presentation of that project. The capstone is designed to complement the student's past experiences and prepare them for their future career endeavors. The Program Director will identify a professional whose work aligns with the student's interests, and the student will work with the capstone mentor to identify the specific project topic. Students will explore and research current knowledge in the field and develop potential solutions to the issue or concern outlined in their project proposal. The student will maintain a weekly log of their capstone project activities, questions/difficulties, planning and self-reflection. The capstone experience will conclude by the student presenting their findings in a formal scholarly work that reflects the topic of current interest in the biomedical and healthcare industries, and integrates scientific knowledge with strong professional skills.

Capstone Project requirements

The capstone project will fulfill several specified criteria and guidelines as determined and outline by the Program Director and Advisory Board. The capstone project is designed in consultation with the mentor and program director and approved by the student's graduate committee. The project should be an individual project that can be completed in approximately a 9-month period. The expectation is that the capstone project be novel and appropriate for public presentation. The project could be administrative, clinical, programmatic, or research focused, and could concentrate on a component of the process or entire project in order to provide a more valuable, in-depth educational experience. The goals for the capstone experience are that in completing the capstone project, the student will (1) gain mastery in the biomedical field by critiquing current research literature related to a specific problem or scientific question, (2) gain advanced disciplinary knowledge and professional skills by applying the appropriate modes of inquiry, research and professional skills to examine and solve a current specific problem or concern in the field of biomedical sciences, (3) integrate information across relevant disciplines in order to solve complex problems, and (4) compose an original scholarly presentation (both written and oral) that reflects the integration of science with strong professional skills. The degree requires a written paper, public seminar, and oral defense of the capstone project.

UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

PROFESSIONAL SCIENCE MASTER'S PROGRAM IN BIOMEDICAL SCIENCES

CAPSTONE PROJECT TITLES 2014-2015

- Ana Caudillo. Mentor: Gretchen Frey, MD, Ob/Gyn Physician, HealthMark Integrative Medicine. ***'Non-hormonal Menopausal Treatments with 4700 Drug and the Effects on Hot Flashes'***
- Caitlin Osborn. Mentor: Nathaniel Hibbs, DO, Emergency physician in Adventist Hospitals. ***'Marijuana related emergency department visits in a state with legalized marijuana'***
- Lisa Rocchio. Mentor: J. Tod Olin, MD, Department Pediatrics/Division of Pulmonary Medicine, National Jewish Health. ***'Developing a Patient-Centered Outcome for Exercise-Induced Laryngeal Obstruction'***
- Tawnee Zuniga. Mentor: Kern Buckner, MD, Chief Division of Cardiology/Dept Medicine, National Jewish Health, ***'Left Atrial Morphologic and Functional Response to Pulmonary Hypertension Pharmacologic Therapy'***

CAPSTONE PROJECTS 2015-2016

- Holly Fleming. Mentor: Kern Buckner, MD, Chief Division of Cardiology/Dept Medicine, National Jewish Health. ***'Statistical Analysis of Hemodynamic Measurements Taken from Pulmonary Hypertensive Patients during Right Heart Catheterization'***
- Elizabeth Seredinski. Mentor: Nate Hibbs, DO, Emergency physician in Adventist Hospitals. '***The Psychologic and Criminal Effects of a SANE Program'***
- Shayla Shell. Mentor: Thomas J Noonan, MD, Sports Medicine/Orthopedic surgery physician, Steadman Hawkins Clinic-Denver. ***'Non-contact versus contact ACL injuries: the incidence of medial versus lateral meniscus involvement'***
- Samantha Iazzetta. Mentor: Richard Reading, PhD, Conservation Director at Southern Plains Land Trust (former Director of Conservation Biology, Denver Zoological Foundation). ***'Andean Condors, The Peruvian Yawar Fiesta and the Issues it Raises'***
- Alexandra Sandberg. Mentor: Michael Pearlman, MD, PhD, Neuro-Oncology and Pediatric Neurology, Blue Sky Neurology. ***'Patterns in SPECT scans of cerebral blood perfusions'***
- Jamie Schutte. Mentor: Reginald Stilwell, Manager, Research & Development-Technology, AlloSource. ***'Intellectual Property Portfolio Valuation Model for a Biotechnology Company'***

CAPSTONE PROJECTS 2016-2017

- Yashar Benham. Mentor: Chad Clary, PhD, Mechanical Engineering, University of Denver. ***'Factors Leading to Component Failure in Total Knee Arthroplasty Patients'***
- Shiema Elhusssen. Mentor: John Truell, MD, Pathology, Swedish Medical Center. ***'Classifying and Treating Lung Cancer'***
- Ted Groff. Mentors: Tami Mullen, Program Manager & Toxicologist, and Roberta Smith, Occupational Health Program Manager, Colorado Department of Public Health & Environment. ***'Respirable crystalline silica exposures during hydraulic fracturing are reduced through implementation of an engineering control for sand delivery'***

- Bryan Pham. Mentors: Joseph Sakai MD, Department of Psychiatry, and Dan Savin, MD, University of Colorado School of Medicine. ***'Risk and Protective Factors in Mental Health Outcomes of Second-Generation Asian Americans'***
- Julia Wachs. Mentor: Haley Chiado, PA, HealthMark. ***'Evaluating the benefits of alternative stress reduction techniques in alleviating the physical symptoms associated with menopause'***

CAPSTONE PROJECTS 2017-2018

- Melissa Jackels. Mentors: Ed Barbera and Christopher Carlton, Chairman of the Board and Chief Executive Officer, Accure Acne Inc. ***'A Clinical Safety Study for Selective Photothermolysis of Sebaceous Glands for Acne Treatment'***
- Mikalyn Johnson. Mentor: J. Tod Olin, MD, Department Pediatrics/Division of Pulmonary Medicine, National Jewish Health. ***'Patient Diagnostic Tool Statistical Analysis for Exercise-Induced Laryngeal Obstruction (EILO)'***
- Molly McMahon. Mentor: James Dillingham, PA-C, St. Joseph Hospital Cardiac & Vascular Institute. ***'A survey of depression screening in outpatient cardiac clinics'***
- Drew Soda. Mentor: Thomas J. Noonan MD, Sports Medicine/Orthopedic surgery physician Steadman Hawkins Clinic/UC Health. ***'Incidence of UCL injury in left versus right handed professional pitchers and association between hand dominance and humeral torsion'***
- Chris Williams. Mentor: Daniel McShan, PhD, The Exzyme Corporation. ***'Low-level laser stimulation of the auricular branch vagus nerve: a pilot study using heart rate variability'***

CAPSTONE PROJECTS 2018-2019

- Alina Beltrami. Mentor: Adam Green, MD, Assistant Professor of Pediatrics, Attending Physician in Pediatric Neuro-Oncology/Oncology, Children's Hospital Colorado. '***Health Disparities in Childhood Cancer and Congenital Brain Tumors****'*
- Meg Cooksey. Mentor: Vandna Jerath, MD, FACOG, Obstetrics & Gynecology, Optima Women's Healthcare. '***MonaLisa Touch as a novel treatment for genitourinary syndrome of menopause and improvement of quality of life****'*
- Zoe Goldthwaite. Mentor: Michael Firstenberg, MD, Chair, Cardiothoracic and Cardiovascular Surgery, The Medical Center of Aurora. ***'Advances & Challenges in Cardiothoracic Surgery***'
- Michael Jursinski. Mentor: J. Tod Olin, MD, Department Pediatrics/Division of Pulmonary Medicine, National Jewish Health. '***The "Breathe to Succeed in Sports" Program: Phase 1****'*
- Chris Koukis. Mentor: Thomas J. Noonan MD, Sports Medicine/Orthopedic surgery physician Steadman Hawkins Clinic/UC Health. '***Differences in Rate of Return to Pitching and Post Tommy John Surgery Performance in Latin American vs. North American MLB Athletes'***
- Paige Petrone. Mentor: Colleen Murphy, MD, Surgery-Surgical Oncology, CU Health. '***How to Evaluate the Use of Clinical Photographs to Demonstrate Breast Aesthetics after Breast Cancer Surgery'***
- Tammy Zhong. Mentor: Sue Kinnamon, PhD, Professor, Dept Otolaryngology, CU Anschutz. '***Surfacing the not so Sweet Truths About Sugar through the Perception of Taste to the Future Outlooks of Sugar'***

CAPSTONE PROJECTS 2019-2020

- Ava Berrier. Mentor: J. Tod Olin, MD, MSCS, Director, Pediatric Exercise Tolerance Center, National Jewish Health. ***'Breathe to Succeed: Education program and Spirometry Screening for Collegiate Swim Teams'***
- Muriel Hart. Mentor: Adam Green, MD, Assistant Professor of Pediatrics, Attending Physician in Pediatric Neuro-Oncology/Oncology, Children's Hospital Colorado. ***'A Retrospective Chart Population-Based Analysis of CNS Tumor Diagnoses, Treatment, and Survival in Congenital and Infant Age Groups'***
- Chase Klungle. Mentor: Mentor: Darlene Tad-y, MD, SFHM, Vice President, Clinical Affairs, Colorado Hospital Association. ***'Effects on Opioid Prescription and Administration via Pain Pathway Intervention'***
- Jennifer Luu. Mentor: William Navarre MD, MPH, US Anesthesia Partners Colorado, Cardiothoracic anesthesiologist. ***'The Effect of ROTEM – based Transfusion Algorithm on Blood Product Utilization after deep hypothermic circulatory arrest (DHCA)'***
- Ashley Lyons. Mentor: Laura Strom, MD, Associate Professor of Neurology, University of Colorado Anschutz Medical Campus. ***'Timing of Trauma in the Lifespan and the Effect on Non-Epileptic Seizures'***
- Simon Monley. Mentor: Pete Mariner, PhD, Chief Scientific Officer, Snoasis Medical, LLC. ***'Review of Expanding Uses for Amnion Chorion Membranes in Dentoalveolar Procedures'***
- Stephanie Madzey. Mentor: Don Stader, MD, FACEP, Associate Medical Director & Emergency Physician, Swedish Medical Center, CarePoint Health Care. ***'An Approach to Integrating Naloxone Distribution and Harm Reduction Education in Emergency Departments'***
- Michaela O'Donoghue. Mentors: Marshall Hoke, Regulatory Affairs Manager, and Holli Cherevka, Chief Operating Officer, Ampio Pharmaceuticals. ***'A new clinical approach to osteoarthritis of the knee: An overview of Ampion Clinical Trials'***
- Nathan Plattner. Mentor: David Weiss, MD, Psychiatry, Mental Health Center of Denver. ***'Treatment Resistant Schizophrenia: further Understanding the Best Treatment Options for This Subgroup'***
- Laura Reed. Mentor: Raj Rai, MD, Medical Director and Physician, Magnolia Medical Group. ***'Measuring Success in Addiction Medicine (Harm Reduction Model)'***

CAPSTONE PROJECTS 2020-2021 *(tentative final titles)*

- **Omar Barakat**. Mentor: J. Tod Olin, MD, MSCS, Director National Jewish Health Exercise and Performance Breathing Center, Associate Professor, Department of Pediatrics, Division of Pediatric Pulmonology, Department of Medicine, Division of Pulmonary, Critical Care & Sleep Medicine, National Jewish Health. ***'Exercise Induced Laryngeal Obstruction in African-Americans'***
- **Anna Brady. Mentor:** Christine Rodgers, MD, Denver Plastic Surgery. ***'The Impact of Covid-19 Restrictions on the Decision to have Elective Cosmetic Procedures'***
- **America Elias Martinez**. Mentor: Christopher Hoyte, MD FAACT FACMT, Medical Director, Rocky Mountain Poison Center and Medical Director Toxicology Clinic, University of Colorado Hospital, Associate Professor, Department of Emergency Medicine, University of Colorado SOM. ***'Access to Opioid Treatment Facilities Across Neighborhoods with Different Racial, Ethnic, and Socioeconomic Compositions'***

- **Anah Gilmore**. Mentor: Jennifer R. Honda, PhD, Assistant Professor, Department of Immunology and Genomic Medicine Center for Genes, Environment, and Health National Jewish Health. ***'Native Hawaiian ancestry and gender in susceptibility to nontuberculous mycobacteria'***
- **Avery Gholston**. Mentor: Jeffrey Wagner, MD, BlueSky Neurology. ***'Understanding Moyamoya Disease and a nontypical case report'***
- **Kara Groetken.** Mentor: Vandna Jerath, MD, FACOG, Obstetrics & Gynecology, Optima Women's Healthcare. ***'Bioidentical Testosterone Pellet Therapy in Women: An Alternative Way to Treat Perimenopausal and Menopausal Symptoms and Improve Quality of Life'***
- **Amelia Hardeman**. Mentor: J. Tod Olin, MD, MSCS, Director National Jewish Health Exercise and Performance Breathing Center, Associate Professor, Department of Pediatrics, Division of Pediatric Pulmonology, Department of Medicine, Division of Pulmonary, Critical Care & Sleep Medicine, National Jewish Health. ***'Respiratory Diseases in Athletics'***
- **Alexandra Hilliard.** Mentor: Adam Green, MD, Assistant Professor of Pediatrics, Attending Physician in Pediatric Neuro-Oncology/Oncology, Children's Hospital Colorado. ***'Patient Level Pediatric Neuro-oncology Health Disparities Analysis'***
- **Mark Izbrand**. Mentor: Timothy Kuklo, MD, Denver International Spine Center. ***'A Novel Cervical Implant'***
- **Amy Meredith**, MA CCC-SLP. Mentors: Lynnelle Smith, MD; Julie Rosser, DO, Department of Pathology, University of Colorado. ***'Updated reference range for nucleated red blood cells'***
- **Jacky Nevarez.** Mentor: Nicole Tartaglia, MD, Children's Hospital, Associate Professor of Pediatrics, University of Colorado School of Medicine. ***'Evaluation of common primary care developmental screening tools to detect developmental delay and recommendation of specialized neurodevelopmental screening protocols for infants prenatally diagnosed with Sex Chromosome Trisomies (SCT) and Fragile X Syndrome (FXS)'***
- **Phikhanh Nguyen**. Mentor: Ira Dauber, MD, The South Denver Heart Center. ***'Clinical cases in cardiology'***
- **Samuel Noonan.** Mentors: Brian Modena, MD MSci, Associate Professor, Division of Allergy & Clinical Immunology, Department of Medicine, and Barry Make, MD, Director COPD Program, Professor of Medicine, Director Pulmonary Rehabilitation and Respiratory Care, Department of Medicine, National Jewish Health. ***'Observed outcomes of COVID-19 Patients Seen at Outpatient Respiratory Clinic'***
- **Ryan Novak.** Mentor: Don Stader, MD, Associate Medical Director & Emergency Physician, Swedish Medical Center, CarePoint Health Care. ***'The Efficacy of Recovery Support Specialists at Preventing Substance Related Readmissions'***
- **Belle Penn.** Mentor: Thomas Noonan, MD, UCHealth Steadman Hawkins Clinic Denver. ***'Return to play and performance in United States women's level 1 and 2 soccer after anterior cruciate ligament reconstruction.'***
- **Samuel Schonfeld**. Mentor: Don Stader, MD, Associate Medical Director & Emergency Physician, Swedish Medical Center, CarePoint Health Care. '***Colorado Naloxone Project'***
- **Erin Townsend.** Mentor: Taylor Triolo, MD, Anschutz Medical Campus, Aurora. ***'Exercising with Type I Diabetes - Integrating Mobile and Wearable Technology with Diabetes Management'***

UNIVERSITY of DENVER
NATURAL SCIENCES & MATHEMATICS

PROFESSIONAL SCIENCE MASTER'S PROGRAM IN BIOMEDICAL SCIENCES

FREQUENTLY ASKED QUESTIONS

1. Why a Profession Science Master's (PSM) degree? How does a PSM degree differ from a traditional Master's of Science (MS) degree?

The PSM degree is not a traditional research-based master's degree. The program provides both advanced scientific knowledge and professional skills. In addition, the PSM degree requires an internship capstone project. The capstone mentor for the project will be a professional from one of the fields in biomedical sciences (for example, allied health professions, pharmaceutical and biotech industries, or private and public health services).

Profession Science Master's (PSM) degree: The PSM degree is a distinctive advanced degree for those intending to pursue a career in the practice of science; it differs from a coursework-only Master's degree and a research-based Master's degree. The NPSMA guidelines state that PSM programs achieve their objectives 'by combining advanced, graduate coursework in science and/or mathematics with an appropriate component of professional skills development and by including an experiential learning component appropriate to the targeted employment sector.' The professional skills components of the PSM program may include business basics, policy, law, regulatory affairs, finance, organizational behavior, ethics, communication, and teamwork (as defined by the NPSMA). In addition, the experiential learning component provides an opportunity for students to demonstrate proficiency in written and oral communication skills.

PSM in Biomedical Sciences program at the University of Denver: The Professional Science Master of Biomedical Sciences degree is a rigorous one-year academic program. This master's degree requires 45-credit hours of course work and successful completion of the written and oral defense of a capstone project. The curriculum includes 24 credit hours of required core courses and 21 credit hours of concentration-focused elective courses. The program director will meet individually with students to create and approve an individual plan of study.

This program will serve students for whom a traditional research-based Master's degree may not be an appropriate option to advance their career endeavors or interests. Graduates from this program may enter careers in biomedical research in academia or industry, clinical research, regulatory affairs, government, or healthcare through further education in professional schools. The PSM program will function as an important bridge for students between undergraduate education and careers in health and biomedical sciences.

2. How long will it take to complete the PSM program?

The program is a one academic year program. Students enter the program in the fall (our academic year begins in early September) and graduate at the end of the spring quarter (early June) or summer quarter (August).

3. Do I have to find my capstone mentor or have my own idea for a capstone project?

No, the program director will match your interests to a professional in the biomedical sciences who will serve as your mentor. This process is an interactive one in which the director works closely with you to identify a capstone mentor and general project area that is appropriate for your future career interests. The capstone mentor and the student will identify the project focus.

4. What is the cost of attendance for this program? Are scholarships and financial aid available for the PSM program? How do I find out more about my financial support options?

Beginning in fall 2020, the PSM in Biomedical Sciences program will carry a new tuition rate of $730 per credit hour. This degree program requires 45 credits for graduate.

Eligibility for general financial aid support and information about other external scholarships is coordinated through the Office of Financial Aid. The PSM program does not have Graduate Research or Teaching Assistantships available.

More information regarding cost of attendance can be found on the DU Admissions- Financial Aid website: https://www.du.edu/admission-aid/financial-aid-scholarships/graduate-financial-aid/cost-attendance/natural-sciences-mathematics

5. How can I learn more about the PSM program in Biomedical Sciences?

For more information and/or to schedule a campus visit, contact Dr. Nancy Lorenzon. We have several scheduled preview days, but you are welcome to schedule a visit during other times. You can reach Dr. Lorenzon at: Nancy.Lorenzon@du.edu or (303) 871-2871. We also can coordinate a time for you to come and visit campus and learn more about the program.