NEUROSCIENCE PROGRAM

CENTRAL MICHIGAN UNIVERSITY

2011 - 2012

Graduate Program Handbook

www.chsbs.cmich.edu/neuroscience/
This handbook will provide an overview of the graduate program in Neuroscience and their degree requirements. This handbook is not intended to replace the *CMU Graduate Bulletin* and the faculty advisor.

The student is expected to:

- Become familiar with the academic regulations of the university and the requirements of the specific program.

- Contact the advisor on a regular basis to keep informed of program requirements and to obtain general assistance in the completion of the program.

- Assume primary responsibility for complying with all regulations of the university, the College of Graduate Studies, and the department and to meet all requirements for the degree within the allowable time limits.

If you have any questions regarding the Neuroscience Program please contact the Program Directors.

**Gary Dunbar, Ph.D.**
Health Professions 2182
Mt. Pleasant, MI 48859
(989) 774–3282
dunba1g@cmich.edu

**Michael Sandstrom, Ph.D.**
Health Professions 2179
Mt. Pleasant, MI 48859
(989) 774–2881
sands1m@cmich.edu
<table>
<thead>
<tr>
<th><strong>Table of Contents</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Description</td>
<td>4</td>
</tr>
<tr>
<td>M.S. in Neuroscience Program Description</td>
<td>5</td>
</tr>
<tr>
<td>M.S. in Neuroscience Degree Requirements</td>
<td>5</td>
</tr>
<tr>
<td>Ph.D. in Neuroscience Program Description</td>
<td>6</td>
</tr>
<tr>
<td>Ph.D. Degree Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Neuroscience Program Course Descriptions</td>
<td>7</td>
</tr>
<tr>
<td>Sample of Potential Electives</td>
<td>8</td>
</tr>
<tr>
<td>Neuroscience Program Graduate Faculty</td>
<td>9</td>
</tr>
<tr>
<td>Admissions Policies</td>
<td>12</td>
</tr>
<tr>
<td>English Language Proficiency Requirements</td>
<td>12</td>
</tr>
<tr>
<td>Time Limit for Admission</td>
<td>13</td>
</tr>
<tr>
<td>Deferred Admission</td>
<td>13</td>
</tr>
<tr>
<td>Conditional Admission</td>
<td>13</td>
</tr>
<tr>
<td>Academic Advisors</td>
<td>13</td>
</tr>
<tr>
<td>Academic Standards</td>
<td>15</td>
</tr>
<tr>
<td>Academic Probation</td>
<td>15</td>
</tr>
<tr>
<td>Academic Load</td>
<td>16</td>
</tr>
<tr>
<td>Registration for Classes</td>
<td>16</td>
</tr>
<tr>
<td>Continuous Registration</td>
<td>16</td>
</tr>
<tr>
<td>Milestones in Completion of Degrees</td>
<td>17</td>
</tr>
<tr>
<td>Policy on Degree Time Limits</td>
<td>18</td>
</tr>
<tr>
<td>Comprehensive Examination</td>
<td>18</td>
</tr>
<tr>
<td>Thesis and Dissertation Committee</td>
<td>18</td>
</tr>
<tr>
<td>Thesis and Dissertation Proposal</td>
<td>19</td>
</tr>
<tr>
<td>Thesis and Dissertation Requirements</td>
<td>19</td>
</tr>
<tr>
<td>Graduation Procedures</td>
<td>21</td>
</tr>
<tr>
<td>Graduation Commencement Ceremony</td>
<td>22</td>
</tr>
<tr>
<td>Financial Assistance</td>
<td>22</td>
</tr>
<tr>
<td>Research and Training Facilities</td>
<td>24</td>
</tr>
<tr>
<td>Student Grade Grievance Policy</td>
<td>28</td>
</tr>
<tr>
<td>Academic Integrity Policy</td>
<td>28</td>
</tr>
<tr>
<td>Policy on Research Integrity</td>
<td>30</td>
</tr>
<tr>
<td>Important Contact Information</td>
<td>50</td>
</tr>
<tr>
<td>Sources of Information within this Handbook</td>
<td>50</td>
</tr>
</tbody>
</table>
**General Description**

**Objectives:** The major objective of the MS/PhD Program in Neuroscience is to provide students with the requisite academic background, technical skills, and hands-on research experience that will allow them to successfully compete for neuroscience-related jobs in the private and public sectors.

**Description:** The program follows a mentorship model, whereby each student will work closely with his or her mentor. Students will design a program of study which best fits their interests and needs, selecting most of their courses in close consultation with their mentor. Most of the coursework will be taken in the first two years, with minimal requirements of two courses in statistics/research methods, a year-long core course in neuroscience, and a neuroscience seminar each semester. In addition, all students will do a practicum or internship that associates their bench research with clinical applications. The predominant philosophy of the program will be its emphasis on applied research, which will be conducted each year, but with a special emphasis on the third and fourth year when students prepare a publishable major paper and dissertation, respectively.

**Entrance Requirements:** Applicants need to provide GRE scores and should have a 3.00 GPA in neuroscience, psychology, chemistry, or one of the bioscience disciplines. Applicants with previous research experience in neuroscience-related areas will be heavily favored, and applicants should have an expressed research interest which matches that of at least one of our program mentors.

**Student Support:** Graduate students accepted into the neuroscience program will have four year support which includes a stipend plus remission of fees and tuition.

**Unique Qualities of the Program:** Although the proposed program will share the critical requirements and expectations of many Ph.D. programs in neuroscience, there are a few areas of emphasis which make this program relatively unique, including:

- **Applied focus.** Although our required core course ensure a fundamental understanding of neuroscience principles and an appreciation for basic research, our primary focus is on training students who have interests in applied research which match those of our program mentors.

- **Mentorship model.** Students in our program are involved in research with their mentors from start to finish. The program is designed for students who already know what area of neuroscience they want to pursue and who have a desire to focus their efforts refining their knowledge and research skills in this area. In fact, students have a great deal of latitude in tailoring their academic program in consultation with their mentor to target specific needs.

- **Clinical relevance.** Translational research, or the ability to bring research from the bench to the bedside, is an area which will be emphasized strongly in this program. As part of an applied focus, our students will have first-hand experience with clinical populations through practicum or internships. This will help students devise new research protocols which may more accurately address the needs of the targeted clinical population.
**M.S. in Neuroscience Program Description**

The Masters of Science (M.S.) in Neuroscience Program at Central Michigan University is designed to give each student a comprehensive understanding or the core principles in neuroscience and the requisite training that will prepare students for further, doctoral-level graduate training or for positions in academics, industry, or government that utilize highly trained research skills in specific areas of neuroscience. Throughout the program, all students are expected to be actively involved in research with a Program faculty member, who serves as a mentor. The focus of the M.S. Program in Neuroscience is the build a broad-based and comprehensive understanding of the basic principles of neuroscience and develop a strong background for applied research in some specific area of neuroscience. Current areas of specific research training include CNS control of respiration and studying the causes and potential treatments for Alzheimer’s, Huntington’s, and Parkinson’s diseases. Students are encouraged to contact Program faculty members in their area of research interest prior to submitting application materials.

**M.S. Degree Requirements**

The Master of Science degree in Neuroscience is based upon the satisfactory completion of a minimum of 30 semester hours of graduate work, including a thesis. The program is broad yet flexible enough to develop individual scholarship in the student’s area of study. Each student is assigned to a faculty member who serves as the student’s mentor/advisor. The mentor is responsible for monitoring the student’s progress through the program particularly with respect to development of research skills. Each student is required to be actively involved in research with their mentor.

**Required Courses I (18 hours)**
- NSC 601 Principles of Neuroscience I – 4 hours
- NSC 602 Principles of Neuroscience II – 4 hours
- NSC 690 Research Seminar in Neuroscience – 1 to 4 hours
- NSC 798 Thesis: Design – 1 to 3 hours
- NSC 799 Thesis: Implementation – 1 to 3 hours

*Note:* A minimum of 4 hours of NSC 690 and 6 hours from a combination of NSC 798 and NSC 799 is required.

**Required Courses II (3 hours)**
One of the following:
- BIO 500 Biological Statistics – 3 hours
- PSY 511 Statistics in Psychology – 3 hours

**Required Courses III (3 hours)**
One of the following:
- BIO 600 Biological Research Design and Analysis – 3 hours
- PSY 611 Research Design – 3 hours

**Electives (6 hours)**
To be chosen in consultation with advisor. Students need a minimum of 2 credit hours from elective courses at the 600 level.

**Total 30 semester hours**
In addition to coursework, the student must complete an oral examination over thesis.
Ph.D. in Neuroscience Program Description

The Doctor of Philosophy (Ph.D.) in Neuroscience Program at Central Michigan University is designed to give each student a comprehensive understanding of the core principles in neuroscience and the requisite training that will prepare students for positions in academics, industry, or government that utilize highly trained research skills in specific areas of neuroscience. The foundation of the Program is provided during the first two years, which encompasses all the requirements for the Master of Science (M.S.) degree in Neuroscience. Throughout the program, all students are expected to be actively involved in research with a Program faculty member, who serves as a mentor. Upon receiving the M.S. degree in Neuroscience (or its equivalent, for students who enter the Ph.D. Program after their second year), students will work closely with their mentor to establish a line of research that will lead to a publishable-quality major paper and dissertation. As such, the focus of the Ph.D. Program in Neuroscience is to build upon the student’s broad-based and comprehensive understanding of the basic principles of neuroscience and develop a strong background for applied research in some specific area of neuroscience. Current areas of specific research training include CNS control of respiration and studying the causes and potential treatments for Alzheimer’s, Huntington’s, and Parkinson’s diseases. Students are encouraged to contact Program faculty members in their area of research interest prior to submitting application materials.

Ph.D. Degree Requirements

Required Courses (48 – 66 hours)
NSC 601 Principles of Neuroscience I – 4 hours
NSC 602 Principles of Neuroscience II – 4 hours
NSC 690 Research Seminar in Neuroscience – 1 to 4 hours
NSC 789 Graduate Seminar in Neuroscience – 1 to 12 hours
NSC 798 Thesis: Design – 1 to 3 hours
NSC 799 Thesis: Implementation – 1 to 3 hours
NSC 800 Neurological Research for Doctoral Candidacy – 1 to 12 hours
NSC 898 Doctoral Dissertation: Design – 1 to 12 hours
NSC 899 Doctoral Dissertation: Implementation – 1 to 12 hours

Note: A minimum of 4 hours of NSC 690, 6 hours of NSC 789, 6 hours from a combination of NSC 798 and NSC 799, 6 hours of NSC 800, and 18 credit hours from the combination of NSC 898 and NSC 899 is required. In addition to course work, a student must complete an oral examination over the thesis, major paper (NSC 800), and the dissertation.

One of the following:
BIO 500 Biological Statistics – 3 hours
PSY 511 Statistics in Psychology – 3 hours

Required Courses III (3 hours)
One of the following:
BIO 600 Biological Research Design and Analysis – 3 hours
PSY 611 Statistics in Psychology – 3 hours

Electives (18 – 36 hours) To be chosen in consultation with an advisor.

Total: 90 semester hours
In addition to coursework, the student must complete an oral examination over dissertation.
Neuroscience Program Course Descriptions:

**NSC 600 Special Issues in Neuroscience** 1–12 (Spec)
Subjects of contemporary neuroscience not covered by regular curriculum. May be repeated to a maximum of twelve hours. Prerequisites: Permission of instructor.

**NSC 601 Principles of Neuroscience I** 4 (4–0)
First of two core neuroscience graduate courses providing comprehensive coverage of neuroscience fundamentals. Prerequisites: none.

**NSC 601 Principles of Neuroscience II** 4 (4–0)
Second of two core neuroscience graduate courses providing comprehensive coverage of neuroscience fundamentals. Prerequisites: NSC 601.

**NSC 690 Research Seminar in Neuroscience** 1–4 (Spec)
Seminar emphasizing review of the primary literature in several areas of neuroscience. May be repeated for a maximum of four credits. Prerequisites: Graduate standing in the Neuroscience Program or permission of instructor.

**NSC 696 Directed Research** 1–12 (Spec)
For students who desire to investigate some research problem in neuroscience. Prerequisites: Graduate standing.

**NSC 697 Independent Study** 1–8 (Spec)
For students accept the responsibility of studying a specific area of neuroscience with minimal supervision. Prerequisites: Graduate standing.

**NSC 789 Graduate Seminar in Neuroscience** 1–12 (Spec)
In-depth exploration of a specific area in neuroscience through the review of the primary literature. May be repeated up to a maximum of 12 hours. Prerequisites: Permission of instructor.

**NSC 798 Thesis: Design** 1–3 (Spec)
Design of a Master’s thesis. CR/NC only. Prerequisites: Graduate standing in Neuroscience Program.

**NSC 799 Thesis: Implementation** 1–3 (Spec)
Completion of a Master’s thesis designed in NSC 798. CR/NC only. Prerequisites: NSC 798.

**NSC 800 Neuroscience Research for Doctoral Candidacy** 1–12 (Spec)
Major research course in which students work in close collaboration with instructor in preparing significant research project in a specific area of neuroscience. Prerequisites: NSC 799 and permission of instructor.

**NSC 898 Doctoral Dissertation: Design** 1–12 (Spec)
Design of a doctoral dissertation. CR/NC only. Prerequisites: NSC 800.

**NSC 899 Doctoral Dissertation: Implementation** 1–12 (Spec)
Completion of the doctoral dissertation designed in NSC 898: data collection, analysis, and write-up. CR/NC only. Prerequisites: Completion of NSC 898.
Sample of Potential Electives for Graduate Students in Neuroscience:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 550</td>
<td>Transmission Electron Microscopy</td>
<td>4 hours</td>
</tr>
<tr>
<td>BIO 552</td>
<td>Scanning Electron Microscopy</td>
<td>4 hours</td>
</tr>
<tr>
<td>BIO 553</td>
<td>Confocal Microscopy</td>
<td>4 hours</td>
</tr>
<tr>
<td>BIO 554</td>
<td>Advanced Electron Microscopy</td>
<td>3 hours</td>
</tr>
<tr>
<td>BIO 556</td>
<td>Biological EDS Analysis</td>
<td>3 hours</td>
</tr>
<tr>
<td>BIO 536</td>
<td>Histology</td>
<td>3 hours</td>
</tr>
<tr>
<td>BIO 537</td>
<td>Immunology</td>
<td>4 hours</td>
</tr>
<tr>
<td>BIO 576</td>
<td>Animal Cell Culture</td>
<td>4 hours</td>
</tr>
<tr>
<td>BIO 591</td>
<td>Neurophysiology</td>
<td>3 hours</td>
</tr>
<tr>
<td>BIO 629</td>
<td>Topics in Eukaryotic Molecular Genetics</td>
<td>1 to 3 hours</td>
</tr>
<tr>
<td>BIO 635</td>
<td>Toxicology</td>
<td>3 hours</td>
</tr>
<tr>
<td>BIO 637</td>
<td>Topics in Immunology</td>
<td>1 to 3 hours</td>
</tr>
<tr>
<td>BIO 692</td>
<td>Topics in Physiology</td>
<td>1 to 4 hours</td>
</tr>
<tr>
<td>BIO 695</td>
<td>Graduate Internship in Biology</td>
<td>1 to 6 hours</td>
</tr>
<tr>
<td>CHM 511</td>
<td>Advanced Analytical Chemistry</td>
<td>4 hours</td>
</tr>
<tr>
<td>CHM 521</td>
<td>Biochemistry I</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHM 522</td>
<td>Biochemistry II</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHM 523</td>
<td>Clinical Chemistry</td>
<td>4 hours</td>
</tr>
<tr>
<td>CHM 527</td>
<td>Biochemistry Laboratory</td>
<td>1 hour</td>
</tr>
<tr>
<td>CHM 528</td>
<td>Bioanalytical Techniques Laboratory</td>
<td>2 hours</td>
</tr>
<tr>
<td>CHM 571</td>
<td>Topics in Chemistry</td>
<td>1 to 9 hours</td>
</tr>
<tr>
<td>CHM 572</td>
<td>Selected Topics in Chemistry</td>
<td>1 to 9 hours</td>
</tr>
<tr>
<td>CHM 624</td>
<td>Advanced Topics in Biochemistry</td>
<td>1 to 9 hours</td>
</tr>
<tr>
<td>CHM 791</td>
<td>Directed Research</td>
<td>1 to 6 hours</td>
</tr>
<tr>
<td>CDO 640</td>
<td>Cadaveric Anatomy for Communication</td>
<td>3 hours</td>
</tr>
<tr>
<td>CDO 701</td>
<td>Psycholinguistic and Neurolinguistic Bases of Language</td>
<td>3 hours</td>
</tr>
<tr>
<td>CDO 705</td>
<td>Traumatic Brain Injury</td>
<td>2 hours</td>
</tr>
<tr>
<td>CDO 717</td>
<td>Aphasia and Related Neurogenic Disorder</td>
<td>4 hours</td>
</tr>
<tr>
<td>CDO 720</td>
<td>Anatomy and Physiology Underlying Neuro-otology</td>
<td></td>
</tr>
<tr>
<td>CDO 740</td>
<td>Neuroanatomy</td>
<td></td>
</tr>
<tr>
<td>CDO 781</td>
<td>Electrophysiological Techniques in Audiology</td>
<td>3 hours</td>
</tr>
<tr>
<td>CDO 785</td>
<td>Auditory Processing Disorders</td>
<td>3 hours</td>
</tr>
<tr>
<td>HSC 560</td>
<td>Clinical Pharmacology I</td>
<td>3 hours</td>
</tr>
<tr>
<td>HSC 561</td>
<td>Clinical Pharmacology II</td>
<td>3 hours</td>
</tr>
<tr>
<td>HSC 582</td>
<td>Regional Human Anatomy</td>
<td>5 hours</td>
</tr>
<tr>
<td>HSC 597</td>
<td>Physiological Response to Abused Substances</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 584</td>
<td>Cognitive Neuroscience</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 585</td>
<td>Psychophysiology</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 587</td>
<td>Physiological Psychology</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 588</td>
<td>Functional Neuroanatomy</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 661</td>
<td>Neuropsychological Assessment</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 687</td>
<td>Physiological Foundations</td>
<td>3 hours</td>
</tr>
<tr>
<td>PSY 727</td>
<td>Developmental Neuropsychology</td>
<td>3 hours</td>
</tr>
<tr>
<td>PHA 625</td>
<td>Clinical Pharmacology I</td>
<td>3 hours</td>
</tr>
<tr>
<td>PHA 626</td>
<td>Clinical Pharmacology II</td>
<td>3 hours</td>
</tr>
<tr>
<td>PTH 626</td>
<td>Neuroanatomy in Physical Therapy</td>
<td>3 hours</td>
</tr>
</tbody>
</table>
Neuroscience Program Graduate Faculty

Gary Dunbar, Ph.D.

Dr. Dunbar’s recent research is focused on testing the efficacy of stem cell transplants and pharmacological treatments for neuropathological and behavioral deficits in animal models of neurodegenerative diseases, particularly Huntington’s and Alzheimer’s diseases. Dr. Dunbar’s research has been supported by awards from both private and public agencies, including the National Institutes of Health and the National Science Foundation.

Dr. Dunbar received his Ph.D. in Psychobiology (Behavioral Neuroscience) from Clark University in 1988. He is a former President of the Michigan Chapter of the Society for Neuroscience and former President of the Faculty for Undergraduate Neuroscience (receiving their Lifetime Achievement Award in 2003). Presently, he is the John G. Kulhavi Professor of Neuroscience, Director of the CMU’s Brain Research and Integrative Neuroscience (BRAIN) Center, Scientific Advisor for the Michigan Chapter of the Huntington’s Disease Society of America, and Associate Editor of the Journal of Undergraduate Neuroscience Education. Dr. Dunbar has received several teaching awards, including Michigan Professor of the Year from the Carnegie Foundation for the Advancement of Teaching and the Council for the Advancement and Support for Education in 1997, and a Distinguished Faculty Member award from the Michigan Association of Governing Boards of State Universities in 1998. He has published several book chapters and articles on recovery of function after brain injury or disease.

Richard Backs, Ph.D.

Dr. Backs defines his research focus as the psychophysiology of attention in human performance. It emphasizes the applied aspects of attention theory, and his recent studies have examined autonomic (electrocardiographic, impedance cardiographic, and pulmonary) and central (EEG and event-related potential) measures concurrently during focused and divided attention tasks in the laboratory and in the driving simulator. Dr. Backs has adopted a cognitive/energetic perspective to account for how cognition is affected by emotion and environmental and task stressors. He also investigates aging affects on the psychophysiology of attention, especially during driving.

Richard W. Backs received his Ph.D. in Experimental Psychology from the University of Southern California in 1984. He has previously held appointments at Occidental College, Washington University, the McDonnell Douglas Corporation, and Wright State University, conducting research in Human Factors Engineering. He has been at Central Michigan University since 1995.

Justin Oh–Lee, Ph.D.

Dr. Justin D. Oh–Lee has over 10 years experience as a preclinical neuropharmacological research in Parkinson’s disease. His recent focus has been testing potential pharmacological treatments for motor dysfunction and response complications in animal models of Parkinson’s disease. He has published more than 30 original research articles and review articles in the areas of Parkinson’s and Alzheimer’s diseases. His NIH–supported L–Dopa research is currently funded by the NINDS.
Dr. Justin Oh–Lee received his Ph.D. in 1995 from the University of California, Los Angeles (UCLA), in Psychology. He received a postdoctoral National Institutes of Health Intramural Research Training Award from 1995 to 1999 and served as a research fellow from 1999 to 2001 at the Clinical Pharmacology Section, Experimental Therapeutics Branch, National Institute of Neurological Disorders and Stroke (NINDS), NIH, Bethesda, MD, before coming to CMU.

Mark Reilly, Ph.D.

Dr. Reilly’s research interests involve the experimental analysis of human and nonhuman behavior, operant/respondent conditioning, behavioral pharmacology and substance abuse. His research interests are eclectic but strive to elucidate basic principles of behavior. He has conducted research on schedules of reinforcement, behavioral variability, drug discrimination, drug tolerance and conditioned reinforcement. His current research focuses on three areas; the motivational properties of response effort or work, the contributions of classical and operant conditioning to impulsivity, and the environmental factors that establish alcohol as a reinforcer. Mathematical modeling of the behavior and its controlling variables is inherent to his research program.

Mark Reilly received his B.S. from the University of Florida in 1989, his M.S. from the University of North Texas in 1993 and his Ph.D. from West Virginia University in 1996. He held a Postdoctoral Fellowship at the University of Michigan and at Wayne State University from 1996 to 1999. He was an Assistant Professor of Research at Arizona State University from 1999 to 2003. He has been at Central Michigan University since 2003.

Michael Sandstrom, Ph.D.

Dr. Sandstrom uses techniques of single–unit neurophysiological recording and microdialysis to explore contributions of neurotransmitters to central nervous system function. He currently explores neurophysiological mechanisms underlying behavioral disruptions in a transgenic mouse model of Huntington’s disease. Dr. Sandstrom focuses research primarily on awake and freely moving animal models.

Dr. Sandstrom earned his doctorate in Neuroscience from Ohio State University in 1998 where he worked with a Parkinson’s disease animal model to explore age–dependent brain plasticity associated with the nigrostriatal dopamine system. During a subsequent postdoctoral fellowship with Dr. George Rebec at Indiana University in Bloomington he mastered techniques of single–unit neurophysiological recording and explored contributions of ascorbate to basal ganglia function. In his current position as an assistant professor of psychology and neuroscience at Central Michigan University he has resumed research in deteriorative diseases of the brain, exploring neurophysiological mechanisms underlying behavioral disruptions in a transgenic mouse model of Huntington’s disease. Dr. Sandstrom focuses research primarily on awake and freely moving animal models.
Reid Skeel, Ph.D.

Dr. Skeel's clinical and research interests focus on neurophysiological assessment. His clinical efforts center on providing functional application of neuropsychological assessment. His research interests are focused on examining variables that affect the ecological validity of neuropsychological tests. Examples of specific projects being conducted in his lab include examining the relationship between cognitive functioning and medication adherence, the impact of anxiety on neuropsychological performance, exploring how newer measures of executive functioning and decision making are related to behavior, cognitive effects of CABG surgery, and detection of sub-optimal effort during testing.

Dr. Skeel received his Ph.D. degree from the University of Florida in 1998. He joined the CMU faculty in 2000. Dr. Skeel coordinates the Neuropsychology Specialty Clinic at Central Michigan University. Dr. Skeel's research interests include: ecological validity of neuropsychological assessment; cognition and medication adherence; influence of affective variables on cognitive performance; decision-making, risk-taking and malingering.

Michelle Steinhilb, Ph.D.

Dr. Steinhilb's graduate studies focused on the cellular trafficking and metabolism of the Alzheimer's disease Amyloid Precursor Protein (APP) using cell culture models. She continued to study neurodegenerative disease during her postdoctoral studies at Harvard Medical School and Brigham and Women’s Hospital, where she used the fruit fly Drosophila melanogaster as a genetic model system. Her research interests include molecular genetics, cellular and molecular biology, and neurodegeneration. Michelle Steinhilb received her B.S. from Wayne State University in 1996 and received her Ph.D. in biochemistry from the University of Michigan in 2002. Michelle’s graduate studies focused on the cellular trafficking and metabolism of the Alzheimer’s disease Amyloid Precursor Protein (APP) using cell culture models.

Ksenia Ustinova, Ph.D.

Dr. Ustinova’s lab covers motor control and learning, rehabilitation of patients with neurological diseases including stroke, spinocerebellar ataxia, and Parkinson’s disease. The mechanisms of motor control and learning and their disruption in patients with different neurological diseases; the recovery and compensation of sensorimotor functions after neurological injury with the use of new rehabilitation techniques including virtual reality and biofeedback. Ksenia Ustinova received both her B.S. in Physical Education/Physical Therapy and her Pedagogy Ph.D. from the Russian State University of Sport, Moscow Russia.
Admission Policies

The following University and Program requirements are necessary for Regular Admission to the graduate program in Neuroscience:

- Completion of a Bachelor of Science degree
- Have at least 15 hours of courses in neuroscience, chemistry, and/or biology (including biologically-based psychology courses)
- Have at least 3 hours of statistics
- Have a 3.0 grade point average (on a 4.0 scale)

(Preference will be given to students with prior research experience, especially in the area of Neuroscience.)

Additional information can be found in the Graduate Bulletin at https://bulletins.cmich.edu/.

Application forms for regular admission are available at http://www.chsbs.cmich.edu/Neuroscience/forms.asp.

English Language Proficiency Requirements

CMU welcomes students from a wide variety of backgrounds. All international students must demonstrate English language competency in one of the following ways:

- Satisfactory score on the Test of English as a Foreign Language (TOEFL)
- Satisfactory completion of a course of study in which the language of instruction was English
- Successful completion (minimum grade point average of 3.0 on 4.0 scale or equivalent) of at least twelve credit hours of work in a recognized graduate program instructed in English
- Employment at a professional level for at least four years, with written verification of the student’s competency in English provided by the student’s current or former employer
- Employment in the United States at a professional level for at least two years in a position that relies on the use of English, with written verification of the student’s competency in English provided by the student’s current or former employer

Further information can be found in the Graduate Bulletin at https://bulletins.cmich.edu/.
Time Limit for Admission

Admission is valid for one year (four semesters: fall, spring, summer I, and summer II). If a student does not register for classes within one year after being admitted to the graduate college, the student will be required to reapply before taking classes. The student's credentials are again reviewed by the department and the student may or may not be readmitted.

Deferred Admission

Newly admitted students may petition the Admissions Committee for deferred admission. Granting deferred admission is at the discretion of the Admission Committee. Deferred admission is typically granted for no more than 12 months from the original matriculation date.

Conditional Admission

Students may be granted a conditional admission into the Neuroscience program in spite of deficiencies in certain subject areas (ex. statistics or chemistry). These students are expected to make up the identified deficiencies in addition to completing the normal prescribed graduate coursework for their degree. Once these standards have been met, students may apply for regular admission.

Academic Advisors

Upon admission, each student is assigned a faculty advisor (mentor) who will serve as the student’s academic advisor for the rest of the student’s enrollment in the program. The advisor will also serve as a mentor for the student’s research. At the end of each school year the advisor will report to the Neuroscience Program Director regarding the student’s progress on coursework and research involvement. This assignment need not be permanent; if the student’s emphasis changes, a student may request a different advisor by submitting a request to the Neuroscience Program Director.

Both the student and the advisor are responsible for maintaining a successful mentoring relationship. It is very important that a good channel of communication be open between the advisor and student. All problems and questions should be brought to the attention of the advisor before seeking assistance elsewhere.

Responsibilities of the Graduate Student:

- Meet regularly with your major advisor and thesis committee
- Read the literature in your field of research
- Complete required courses maintaining a GPA > 3.0
• Complete your thesis (or Plan B paper) and submit manuscripts for publication
• Present your results at local, state and/or national meetings
• Become an independent, critical thinker—use library resources, experimental results, and advice from fellow graduate students

Work Expectations:

• GA’s require 20 hours per week
• Course work = 3 hours for every credit hour (ex: 3 x 9 = 27)
• Thesis work

• Maintain a clean, safe laboratory and work environment
• Be responsible for appropriate training (chemical safety, CPR, etc.)
• Assist others in the laboratory, especially new graduate and undergraduate students
• Apply for funding from different sources to support your research and travel
• Attend departmental seminars and other relevant presentations and functions

Responsibilities of the Faculty Advisor:

• Meet regularly with graduate students to assess progress
• Discuss overall program of study and course requirements with graduate students
• Discuss expectations regarding thesis research projects, time table, publication, etc.
• Help graduate students choose a thesis committee
• Acquaint students with the laboratory and its policies
• Assist with experimental protocol, data analysis, scientific writing, and seminar preparation
• Assist in obtaining funding for graduate student research
• Provide feedback on proposals, manuscripts, posters, etc. in a timely manner
• Encourage students to attend professional meetings
• Ensure that necessary research equipment is available and in working order
Academic Standards

<table>
<thead>
<tr>
<th>Letter Grades</th>
<th>Points Per Semester Hour</th>
<th>Not included in GPA or graduation credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
<td>NC = No Credit</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
<td>I = Incomplete</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
<td>W = Withdrawal</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
<td>X = Audit</td>
</tr>
<tr>
<td>B-</td>
<td>2.7</td>
<td>Z = Deferred</td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
<td>CR = Credit (counts toward graduation, but not on GPA)</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>C-</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Grades below a C do not count toward meeting requirements for any graduate degree.

A 3.0 grade point average (GPA) is required for all graduate degrees.

Graduate students are expected to maintain a 3.0 or higher GPA in their graduate program. If a semester GPA falls below a 3.0, the College of Graduate Studies will place the student on academic probation. A GPA below 3.0 for two consecutive semesters is sufficient justification for removing a student from degree candidacy or for removing financial assistance.

Academic Probation

If a student’s GPA drops below 3.0 in any session, the student is placed on probation. Once placed on probation, a student must show satisfactory progress toward regaining a 3.0 cumulative GPA by earning a GPA ABOVE a 3.0 during the next semester. When the GPA reaches 3.0, the student will be removed from probation. If a student fails to obtain a GPA higher than 3.0 in the first session following notification of probation status, the department may recommend to the Dean of the College of Graduate Studies that the student be removed from the degree program. A department may ask to extend the probation for an additional session if circumstances warrant. If a student does not regain a 3.0 GPA by the end of the second session, they may continue in the program only if the department makes a specific request and the Dean of the College of Graduate Studies concurs. (A non-degree student who fails to obtain a GPA higher then 3.0 the first session after being placed on probation may not continue taking classes.)
Academic Load

The following is a typical academic load for full time graduate students; however, there is no minimum load requirement for graduate studies. It is expected that students will assess need, ability, and other factors in order to register for a class load that permits them to maintain academic standards.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>9 – 12</td>
</tr>
<tr>
<td>Spring</td>
<td>9 – 12</td>
</tr>
<tr>
<td>Summer Session</td>
<td>4 – 6</td>
</tr>
</tbody>
</table>

Registration for Classes

Students are encouraged to register for classes during Phase I registration to ensure course requests can be honored. The Neuroscience Department has no obligation to honor course requests when students fail to pre-register and classes are full. In order to add a class after it has reached capacity enrollment, the department requires written permission from the instructor.

Continuous Registration

Any on-campus student who has competed all academic coursework except the final project (Plan B project, thesis, dissertation, doctoral project) must be enrolled in at least one CMU graduate credit hour each fall and spring semester until graduation (summer sessions as well if summer coursework is normally required in the program). The continuing registration for the final research project can fulfill this one credit hour requirement. If, after all academic coursework except the final project is completed, a student does not enroll each semester (and summer, where appropriate) until graduation, the student must enroll retroactively for each missed semester (including summer where appropriate) once they return to complete the project. A student can request a leave of absence by submitting a Leave of Absence Request form to the College of Graduate Studies; if approved, continuous registration will be waived during the approved leave period. Regardless of whether the student has a leave of absence, the student must still complete the degree within the degree time limitations set forth under the degree requirements presented under Duration of Admission Status in the Bulletin. See the Graduate Bulletin for details at https://bulletins.cmich.edu/.
Milestones in Completion of Degrees

To complete their degree in a timely fashion, students should adhere closely to the schedules below. Forms and instructions can be found at [http://www.grad.cmich.edu/forms.htm](http://www.grad.cmich.edu/forms.htm). Students also need to check with the Graduate College for deadlines to submit their Graduation Application. The Graduate College has developed a checklist for *Self Audit for Graduation* ([http://www.grad.cmich.edu/forms.htm](http://www.grad.cmich.edu/forms.htm)) for students to use to make sure that they complete all degree requirements and can submit all forms on time.

### Master’s Degree

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fall</td>
<td>Begin coursework</td>
</tr>
</tbody>
</table>
| 1    | Spring   | Begin M.S. Thesis Proposal  
Submit M.S. Authorization of Graduate Degree Program form |
| 1    | Summer   | Continue research |
| 2    | Fall     | M.S. Thesis Proposal approved  
Submit Prospectus for Thesis and Dissertation form |
| 2    | Spring   | Complete M.S. Thesis  
Submit Thesis Plan A & B Completion Sign-off form |

### Ph.D. Degree

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Milestones</th>
</tr>
</thead>
</table>
| 3    | Fall     | Begin Comprehensive Project  
Submit Authorization of Doctor of Philosophy in Neuroscience form |
| 3    | Spring   | Finish Comprehensive Project |
| 3    | Summer   | Continue research |
| 4    | Fall     | Complete Dissertation Proposal  
Submit Prospectus for Thesis and Dissertation form |
| 4    | Spring   | Complete Doctoral Dissertation  
Submit Dissertation Project Sign-off form |
Policy on Degree Time Limits

It is the program’s policy that all course requirements for the M.S. degree be completed within seven years after matriculation and within eight years after matriculation for the Ph.D. degree. Both programs are full-time, on-campus degree programs. See the Graduate Bulletin (https://www.bulletins.cmich.edu) for details.

Comprehensive Examination

The paper and oral examination from the NSC 800 project serves as the comprehensive examination. Papers are expected to be publication quality and typically consist of a literature review, method, result, and discussion section reporting the outcome of a year-long empirical research project conducted in collaboration with the student’s advisor. The examination generally includes the student’s defense of thesis work, but any aspect of the student’s graduate program is open for discussion.

A Comprehensive Examination Committee must be created to evaluate the oral portion of the examination. The committee must consist of at least two Neuroscience faculty members with graduate faculty status. This exam should generally be scheduled during fall or spring semester, when faculty are available.

A copy of the approved paper must be given to the Neuroscience Program secretary for the student's file.

Students who are unable to pass the comprehensive examination after three attempts will be dismissed from the program.

The student must register for all 12 credit hours and pass the oral examination prior to admission to doctoral candidacy. Students cannot take more than 6 hours of NSC 800 until finished with the thesis.

Thesis and Dissertation Committee

Thesis committees must consist of three members with graduate faculty status. Two members must be faculty advisors in the Neuroscience Program.

Dissertation committees must consist of at least three Neuroscience Program faculty advisors with graduate faculty status.
Thesis and Dissertation Proposal

A Prospectus for Theses and Dissertations must be completed to begin research on a thesis or dissertation. Students must complete the following steps for the prospectus forms:

1. Email thesis/dissertation committee members to schedule prospectus meeting

2. Email Neuroscience Program secretary to schedule a room with date and time of prospectus

3. Print and complete Prospectus and required forms from the Neuroscience website
   
   A. All graduate students using animals in their research must have IACUC approval for the use and care of animals before any work can begin.
   
   B. All graduate students using humans in their research must have IRB approval of their research before any work can begin.

4. Complete Prospectus form prior to proposal meeting and get committee members signature at proposal meeting. A copy of the abstract must be turned in with the form.

5. Bring completed Prospectus form and IRB or IACUC application to the Neuroscience Program secretary, who will hold the forms until you receive IRB or IACUC approval email

6. Forward IRB approval email to Neuroscience Program secretary. Once IRB approval is received the Neuroscience Program secretary will get the required signatures and forward to the Graduate Office.

Students may not enroll for more than three thesis or dissertation credits until the project prospectus has been approved by both the department and the College of Graduate Studies and the College of Graduate Studies has verified the composition of the student’s committee. The Graduate Bulletin (https://bulletins.cmich.edu/) outlines all University policies relating to theses/dissertations.

Thesis and Dissertation Requirements

The same principles generally hold for the master’s thesis and doctoral dissertation. As a general concept, the doctoral dissertation (required of all doctoral students) will be related to the student’s interests and to some aspect of professional practice. The goal of the doctoral dissertation is further integration of the student’s graduate education in developing the ability to investigate a professional problem in a scholarly manner. Students must have been admitted to doctoral candidacy by the College of Graduate Studies prior to defending their dissertation proposal.
Information regarding University procedures for thesis or doctoral dissertation preparation is available from the College of Graduate Studies ([http://www.grad.cmich.edu/forms.htm](http://www.grad.cmich.edu/forms.htm)). The steps usually followed are:

1. Student discusses their idea with a faculty member
2. Student obtains a chair and committee members
3. Student writes a prospectus for committee approval. The prospectus includes the following topics:
   A. Introduction to the problem (a case is made for the importance of the area of study)
   B. Review of the literature
   C. Statement of the problem
   D. Method (as appropriate)
      a. Participants or Sample
      b. Instrumentation/Materials
      c. Procedures
      d. Statistical Analysis
4. Student convenes the committee to discuss, fine tune, and approve/disapprove the idea
5. Thesis and Doctoral Dissertation Prospectus form is filed with the graduate office and department. Also, approval from CMU's Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC), must be obtained before research involving human or animal subjects is started.
6. Thesis/Dissertation is completed
7. Oral defense of project
8. Students are expected to provide the Library, department, and their committee chair person (unless they state otherwise) with a bound copy of the thesis or dissertation.
Graduation Procedures

To graduate, a Master's degree student must:

1. Have regular admission to the degree program
2. File an Authorization of Graduate Degree Program form
3. Complete a minimum of 30 semester hours of graduate work with a GPA of 3.0 or higher. Of these 30 credits, no more than 15 can be transfer credits, no more than 1/3 can be unspecified content or variable credit courses, and no more than 10 can be independent study or thesis credits.
4. Earn at least a "B" grade in each course
5. Earn 15 or more hours for the degree in courses at or above the 600 level
6. Fulfill all requirements of the chosen curriculum and all other university regulations pertaining to the program
7. Complete all requirements pertinent to either Plan A or Plan B or any alternative requirements of the department
8. Send a completed Graduation Application form along with a check or money order for the $50.00 fee to the College of Graduate Studies approximately eight weeks before the end of the semester. Deadlines are listed on the College of Graduate Studies website at http://www.grad.cmich.edu/dates.htm.

To graduate, a doctoral degree student must:

1. Have a master's degree, if required
2. Have regular admission in the program
3. Be admitted to candidacy
4. Satisfy any research or professional requirements of the department
5. Complete a minimum of 90 semester hours of graduate work beyond the bachelor's degree with a GPA of 3.0 or higher (individual programs may require additional credits)
6. Earn at least a "B" grade in each course. A student will not be awarded a doctoral degree with more than two grades below "B−" (coursework not part of a student's doctoral program is excluded from this policy) (individual programs may require additional credits)
7. Complete a doctoral dissertation

8. Earn at least 15 hours in 700 level courses or above (excluding dissertation and internship credits) and 50 of the total hours at the 600 level or above

9. Pass a final oral exam in defense of the dissertation

10. Send a completed Graduation Application form along with a check or money order for the $50.00 fee to the College of Graduate Studies approximately eight weeks before the end of the semester. Deadlines are listed on the College of Graduate Studies website at http://www.grad.cmich.edu/dates.htm.

Graduation Commencement Ceremony

Students must finish all requirements for their degrees before they can participate in graduation ceremonies. Diplomas are mailed to students approximately six weeks after commencement. If evidence of degree completion is required in less than six weeks, written verification can be obtained through the College of Graduate Studies.

Financial Assistance

Graduate Assistantships
Graduate Assistantships (GA’s) are available through the Neuroscience Program each academic year. GA’s are generally assigned to individual faculty to assist with research. Graduate assistant benefits include a stipend, tuition scholarship, classification as a Michigan resident, travel accident insurance, and special library privileges. Full-time graduate assistants will receive a stipend and tuition will be waived for up to 30 credits per academic year.

The tuition remission schedule for a full-time 12 month appointment is:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hours Waived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer II</td>
<td>5</td>
</tr>
<tr>
<td>Fall</td>
<td>10</td>
</tr>
<tr>
<td>Spring</td>
<td>10</td>
</tr>
<tr>
<td>Summer I</td>
<td>5</td>
</tr>
</tbody>
</table>

A student may register for more credits than the tuition remission schedule allows; however, the student will be responsible for the additional tuition.

Graduate Assistant appointments require that students maintain a 3.0 GPA in graduate work. GA’s with fall/spring appointments must register and maintain a minimum of six semester hours of graduate credit at CMU during each semester. GA’s with summer appointments must register for and maintain a minimum of one hour of graduate credit during the summer session at CMU. Requests for
exceptions will be evaluated on a case by case basis by the Dean of the College of Graduate Studies. Full-time GA's typically work approximately 20 hours per week during fall/spring semesters and approximately 320 hours throughout the summer. An Assistantship is like any other job; the GA must perform satisfactorily, that is, in line with his or her supervisor’s expectations. Please refer to university policies and procedures for information on progressive discipline.

**Graduate Fellowships**

The College of Graduate Studies award Graduate Fellowships on a competitive basis to students with outstanding academic records who are interested in completing theses or other major works of scholarship. This fellowship is intended for graduate students who support the advancement of diversity in higher education. Only students enrolled in a full-time master’s or specialist's degree program only at CMU's Mt. Pleasant campus are eligible. Doctoral students should apply for Doctoral Research Fellowships. Additional information can be found in the Financial Aid section of the Graduate Bulletin [https://bulletins.cmich.edu/](https://bulletins.cmich.edu/).

**Dissertation Research Support**

The College of Graduate Studies provides small grants, up to a maximum of $2,000, for dissertation-related costs such as photocopying, travel, supplies, etc. (wages cannot be covered). Students who have had their dissertation prospectus approved by their dissertation committee are eligible to apply for this support. Recipients will be selected on the basis of proposals reviewed by the Dissertation Support Selection Committee. Additional information is available at [www.grad.cmich.edu](http://www.grad.cmich.edu) under the Applications and Forms tab.

**Publication and Presentation Grants**

Graduate Student Publication and Presentation Grants are awarded to assist graduate students whose research or creative endeavors are accepted for publication or presentation at the state, national, or international level. The grant consists of reimbursement for up to $350 of expenses associated with publication or presentation. Applications are available from the College of Graduate Studies and are reviewed as they are received.

The College of Humanities and Social and Behavioral Sciences offers a grant to undergraduate and graduate students whose research or creative endeavors are accepted for presentation at the state, national, or international level are eligible for an Undergraduate/Graduate Student Presentation Grant. The award consists of reimbursement for up to $250 of expenses associated with presentation. Additional information is available at [www.chsbs.cmich.edu/CurrentStudents/Scholarships.asp](http://www.chsbs.cmich.edu/CurrentStudents/Scholarships.asp).

**Outside Grants and Student Loans**

Foundations and government agencies often have grant programs for which students may compete. Some of these can be quite generous. You can contact the College of Graduate Studies, Office of Research and Sponsored Programs, Office of Veterans’ Benefits, or Student Personnel Services for further assistance.

Students may also get loans at favorable terms. You can find additional information on student loans at your local bank or the Office of Scholarships and Financial Aid. Tuition and living expenses at CMU are low compared to many universities; a modest loan may get you through graduate school at CMU.
Research and Training Facilities

The Neuroscience Program has a variety of facilities used for the education of students. Below is a partial list of the available campus and department facilities.

Graduate Student Offices: Graduate Assistants and Fellowship recipients have space available to them in faculty laboratories.

Computer Laboratories: The Department of Psychology maintains a computer laboratory with 6 workstations and a printer exclusively for graduate student use in Sloan Hall.

The Biology Department has a Resource Room available to Biology students in Brooks 171. The computer lab supports a variety of programs necessary for Biology coursework. There is also a computer lab located in Brooks 101 with 23 workstations including 4 Macintosh computer systems.

The Department of Psychology maintains computer laboratories for research and teaching purposes in Sloan Hall. The labs include a total of 12 workstations. These machines are networked to a printer and various experiment generation and SPSS software applications are installed. The lab serves students and faculty interested in research in cognitive processes, sensation and perception, learning, and social psychology.

Park Library: The Park Library provides a book collection of 1,000,000 volumes and an online catalogue which allows students to quickly peruse the holdings in a specific area. A wide variety of research databases are available. Desk and study carrels are also available for students.

BRAIN Center Labs

BRAIN Center Core Facilities: These facilities are shared among Brain Center faculty. We share two freezing microtome/cryostat units both of which cut frozen sections at -20°C (Vibratome Ultra-Pro 5000 and Microm HM505E). Our cell–molecular room contains two Coulochem III High Performance Liquid Chromatography units with electrochemical detectors and connected refrigerated autosamplers (ESA Corporation, Chelmsford MA). Within the Brain Research and Integrative Neuroscience (BRAIN) Center, our core facilities room has a spectrophotometer for tissue/protein analysis and two PCR units. We have two large upright -80°C ultrafreezers (Thermo Forma & Revco). There are also two Level 2 biosafety cabinets and two incubation chambers. There are two large refrigerated centrifuges. Our Microscope Lab has three powerful microscopes, two with fluorescent lamps for fluorescence viewing and one connected to Neura–Lucida. Our computer lab contains 10 PC desktop computers running Windows XP with full network service. We also have a walk-in cold room, a radio–isotope room, and a film–developing dark room. Our animal colony wing has five state of the art active animal housing rooms as well as two behavioral testing rooms where mouse and rat behavior tests are performed, and two surgery rooms equipped with precision stereotaxic equipment and stainless steel surfaces for rodent survival surgery.

Our behavior testing rooms include eight separate rooms for a wide variety of behavioral testing, including: operant testing (with several Skinner boxes for both rats and mice), elevated–plus mazes, Morris water mazes and T–mazes, freely moving animal microdialysis, freely moving animal
electrophysiology with iontophoresis capacity, and other specialized testing. All testing and procedure rooms are equipped with dim red lights and white light cycling for work performed in reverse day–night so behavior can be tested during animals' nocturnal phase. In addition, each of the testing and procedure rooms are equipped with a digital camera that can be controlled remotely and fed into one of eight customized analysis stations which contain video tracking and computer equipment with a variety of computer programs for specified behavior collection and analyses.

**Dunbar Lab:** The Field Neurosciences Institute (FNI) Laboratory is part of the Brain Research and Integrative Neuroscience (BRAIN) Center, located on the second floor of the research wing in the Health Professions Building. The research mission of the FNI laboratory is to better understand the mechanisms involved in recovery of function following damage to the central nervous system and to devise strategies to promote these mechanisms in clinically relevant ways. Current research focuses on devising potential treatments for neurodegenerative diseases, particularly Huntington’s disease (HD), Parkinson’s disease (PD), and Alzheimer’s disease (AD). The lab is fully equipped with a wide variety of specialized equipment for testing the efficacy of pharmacological treatments, stem cell therapies, and genetic manipulations to counteract neuropathological and behavioral deficits in rodent models of HD, PD, and/or AD.

**Oh–Lee Lab:** The lab is located in the Health Professions Building. Studies are conducted in behavioral and neuronal plasticity and programmed cell death, particularly those that are related to neurodegenerative disorders such as Parkinson's disease, Huntington's disease, Alzheimer's disease, and other related neurodegenerative disorders. The laboratory is equipped with two large chemical safety hoods, stirrer hot plates, a Cryostat brain sectioning station, and numerous other scientific and behavioral instruments. The laboratory is also well equipped to carry out a variety of biochemical, molecular and histological tissue analyses central to the research carried out in this laboratory.

**Sandstrom Lab:** The Sandstrom lab is focused primarily on freely-moving animal research of deteriorative diseases. It is fully equipped for microdialysis neurochemical investigations, and is in process of establishing the necessary systems to initiate electrophysiology investigations in freely-moving animals. Current experiments focus on the relationship between neurochemical malfunctions occurring during early stages of Huntington’s disease and early-stage cognitive decline. To accomplish this, microdialysis measurements are taken during trained operant behavior to drive goal-directed neuronal activity. Early disruptions of neurotransmitter control may provide clues into the initial malfunctions taking place in neuronal function that therapeutic interventions may be better off supporting rather than focusing heavily on the final stage of neuron death. Future experiments hope to incorporate experiments with electrophysiology and various therapeutic interventions such as targeted drugs or stem cell therapies. Ideally, these experiments can be performed with improved insights into the goal neurotransmitter release rates or activity states that otherwise healthy animals exhibit so that therapeutic success can be assessed at the level of the brain rather than exclusively behaviorally.
young adults and the elderly. Research on the cognitive and affective processing capabilities of healthy young and older adults and of adults who have neurodegenerative diseases is conducted using a battery of computerized tasks. A variety of measures are used in this laboratory, including electroencephalography (dense-array EEG and event-related brain potentials), cardiovascular (electro- and impedance cardiography, blood pressure), pulmonary, and electrodermal responses. Previous research projects have been funded by the US Air Force and General Motors Corp. These projects have investigated the use of physiological responses to measure attention during performance of manual control task and in driving simulations. Potential applications of this research include the prediction of driver distraction and the use of psychophysiological measures of attentional underload and/or overload as a component of an augmented-cognition adaptive-interface to technological systems in aircraft and automobiles. Previous projects have also looked at developing a psychophysiological selection test for jobs such as air traffic control specialist that have very high demands upon an operator’s ability to divide attention.

**Engineering Psychophysiology Lab:** The Engineering Psychophysiology laboratory conducts research on the psychophysiology of attention in human performance. The current focus of the laboratory is on attention, distraction, and the use of advanced telematic devices during driving. A variety of central and autonomic nervous system measures are used in this laboratory, including electroencephalography (dense-array EEG and event-related brain potentials), cardiovascular (electro- and impedance cardiography, blood pressure), pulmonary, and electrodermal responses. Previous research projects have been funded by the US Air Force and General Motors Corp. These projects have investigated the use of physiological responses to measure attention during performance of manual control task and in driving simulations. Potential applications of this research include the prediction of driver distraction and the use of psychophysiological measures of attentional underload and/or overload as a component of an augmented-cognition adaptive-interface to technological systems in aircraft and automobiles. Previous projects have also looked at developing a psychophysiological selection test for jobs such as air traffic control specialist that have very high demands upon an operator’s ability to divide attention.

**Reilly Lab:** The Behavior Analysis Behavioral Pharmacology Laboratory is located in rooms 201–204 of Rowe Hall. The facilities include both rodent and aviary colonies and state-of-the-art environmental control equipment and behavioral testing apparatuses. Experimental chambers are fully equipped with multiple response manipulanda and reinforcer delivery systems, including syringe pumps for drug delivery. There is a surgery room and a conference area with computer workstations for data analysis. There is also a student laboratory equipped with 10 operant conditioning stations.
Neurobiology Labs:

Microscopy Core Facilities: The Scanning Electron Microscope at CMU is a JEOL JSM–840A with a WinDISS add–on active scan digital image collection package. The system is fully networked and integrated with WinDISS EDS software and hardware. Image acquisition is under full user control with a maximum pixel dimension of 4000x3200. Our TEM is a Philips CM10, a user–friendly instrument that still requires understanding of how to operate a TEM. It is remarkably stable and immune to undergraduate student use, making it an excellent teaching instrument. Film is used for recording images, and an Epson 4990 flat–bed scanner is used to digitize the micrographs. lab that is used to generate high quality digital images from the negatives.

The Olympus Fluoview 300 is the newest addition to the facility. Our Confocal Laser Scanning Microscope (CLSM) is based on an Olympus BX50 upright microscope, and has Differential Interference Contrast (DIC) optics and two extra–long working distance water immersion objectives on a special two position turret. A microinjection system for electrophysiological studies is also available. This microscope uses three PMT detectors, two for epi–confocal imaging, and one for transmitted–light imaging. Imaging capabilities include reflected–light confocal and transmitted–laser DIC imaging. Argon 488 nm and He/Ne lasers are installed on the microscope.

DNA Sequencing and Analysis Core Facility: The DNA Sequencing and Analysis Core facility has an ABIPrism 310 Genetic Analyzer, a fully automated instrument used for DNA sequencing. Our data collection software manages the instrument set–up and controls instrument operations which minimizes human induced error. The facility also has a Molecular Devices GenePix 4000B microarray scanner, which is a highly sensitive laser–based system designed for rapid imaging of microarrays. This instrument is useful in determining differences in gene expression or gene copy number and can be used for single organism studies, including yeast, Drosophila, C. elegans, E. coli, and mixed environmental samples A Kodak Gel Logic 2200 Molecular Imaging System is also available. This system has the flexibility to detect chemiluminescent, fluorescent, and colorimetric samples and is widely used to image and quantify both nucleic acids and proteins. This instrument also can act as a plate reader for ELISA reactions, automate bacterial colony counting, and eliminate the need for film development of Western blots. An ABI 7500 Real–time PCR instrument is also housed in our facility and enables high speed thermal cycling in a 96–well format that reduces run times to less than 40 minutes. This instrument utilizes variable excitation and five–color detection systems and enables you to use a broad range of fluorophores for greater assay versatility.

Steinhilb Lab: Dr. Steinhilb’s research lab is equipped with resources to conduct neuroscience research including several stereo microscopes, environmental chambers designed for insect growth, molecular biology tools (PCR thermocycler, agarose/acrylamide gel electrophoresis) and tissue culture equipment. In addition, there is immediate access to the DNA Sequencing and Analysis Facility and the Microscopy Facility, both in Brooks Hall. Undergraduate and graduate research projects in neuroscience utilize several scientific approaches including molecular genetics as well as cellular and molecular biology. The Steinhilb lab has equipment and resources to perform and analyze experiments utilizing Drosophila modifier analysis, genetic screens, biochemical pathways, tissue culture, and cell biology.
Student Grade Grievance Policy

Responsibility for resolving grading disputes is shared among the instructor, the student, the department, and the college. A student who desires discussion of a complaint about a grade must follow these steps:

1. Contact the instructor (if the instructor is unavailable, contact the department chairperson). This may be done in person or in writing as soon as possible, but no later than 60 days after the next semester begins. Exceptions will only be made in the most compelling situations.

2. If still dissatisfied, the student should request, in writing, a joint consultation with the instructor and department chairperson. If the instructor is also the department chairperson, the request should be addressed to the dean of the college.

3. If the student still feels the grade is the result of capricious grading, they may file an appeal within 90 days of the start of the next regular semester. This appeal is made to the dean of the college and will be forwarded to the School Committee on Review of Change of Grade.

The Grade Grievance Policy can be found in the Graduate Bulletin (https://bulletins.cmich.edu/).

Academic Integrity Policy

Because academic integrity and ethical behavior are vital to an academic environment and to the development of qualified neurologists, graduate students are responsible for learning and upholding professional standards of research, writing, assessment and ethics. In the academic community the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. Written or other work which a student submits must be the product of his/her own efforts and must be consistent with appropriate standards of professional ethics. Academic dishonesty, which includes plagiarism, cheating and other forms of dishonest behavior is prohibited. Allegations of academic dishonesty or unethical behavior will be handled according to the policies given here. Appeals of decisions are processed according to the policies set forth in the “Academic Integrity Policy for Graduate Students” published in the Graduate Bulletin (https://bulletins.cmich.edu/). Any appeal decision reached pursuant to this section shall be final and not subject to further review.

Although no specific time line is included in this policy, it is understood that matters should be handled expeditiously.

1. In cases where an instructor, supervisor, or fellow student believes a student has demonstrated academic dishonesty or professionally unethical behavior, the instructor, supervisor, or fellow student should report the incident to the Program Director.
2. The Program Director will discuss the allegation with the person(s) making them. If the Program Director believes that there is evidence to support the allegations the Director will notify the student of the charges in writing. This letter will inform the student of the allegation and that program faculty will be asked to review the allegation, look at evidence and determine what, if any, sanctions should be issued. The student will be offered the opportunity to admit to the violation, remain silent, meet with the committee to share their perceptions of the incident or submit a written rebuttal to the charges. The student will be given a response deadline, at least two weeks in the future.

3. The program faculty will review allegations of academic dishonesty or unethical behavior. In any case where a member of the program faculty made the original allegation, the faculty member will be excluded from judging the particular case.

4. If the student elects to meet with the committee to present his/her version of the events under investigation, the student may bring another person (i.e. an advocate) to the meeting to provide support and advice.

5. The faculty's decision on culpability and appropriate sanctions will be communicated in writing to the student. If the student is found not culpable or if sanctions other than dismissal or suspension from the program are issued, the department chairperson will be notified in writing.

6. If the sanction is dismissal or suspension from the program, the sanction will be communicated through the department chairperson to the Dean of the College of Graduate Studies. The Dean of the College of Graduate Studies will inform the student of the decision. This decision is final and is not subject to further review.

7. If sanctions are issued, committee records will be retained for a least one year.
Policy on Research Integrity

Integrity in research and creative endeavors is at the heart of many academic endeavors and a fundamental principle in the university community. Faculty, staff, students and independent contractors all have a responsibility to assure that research and creative endeavors meet accepted standards of scholarly performance. The increasing complexity of the research and creative process, the requirements of federal and state agencies, and the accountability of university personnel to colleagues, students, the university, and the larger community necessitate that CMU specify an acceptable code of conduct, provide a mechanism for investigating alleged violations of accepted standards, delineate appropriate public record follow any discovery of misconduct.

The policy for dealing with allegations of research misconduct at Central Michigan University, is included on the next pages. If you have any questions regarding this policy please contact your advisor.

I. Introduction

A. General Policy

It is the policy of Central Michigan University (“CMU”) to require its faculty and other researchers to observe the highest standards of professional conduct in all of their scholarly, research and creative activities. The enterprise of academic research relies upon the trust and confidence of the entire academic community and the public at large in the integrity of the academic research process. Unethical behavior in research and creative activities represents a breach of confidence among faculty and other researchers and undermines the advancement of knowledge. It also undermines the confidence that the public and research subjects should have in the reliability of CMU. For these reasons, CMU considers Research Misconduct, as defined below, a betrayal of fundamental scholarly, research and creative principles, and shall deal promptly with all instances of possible Research Misconduct.

B. Scope and Application

1. This policy and the associated procedures (“Policy”) apply to all research activities conducted under the auspices of CMU, whether or not they are externally funded. This Policy applies to any individual paid by, holding an appointment from, or affiliated with CMU, such as faculty members, post-doctoral fellows, trainees, technicians and other staff members, guest researchers, independent contractors, graduate students and undergraduate students (the latter subject to Section I.B.2 below). Such persons are subject to this Policy regardless of whether their research is conducted on or through the main campus in Mount Pleasant, Michigan, the centers of ProfEd, or elsewhere.
2. This policy shall apply to students involved in the following research and creative endeavors:
   a. Those conducted jointly with a CMU faculty or staff member or with any person from another university.
   b. Those externally funded under a grant or contract to CMU or internally funded by CMU.
   c. Those expected (imminently or eventually) to be published, presented, or shared with the broader academic community outside the student’s classroom.
   d. Those done in conjunction with a thesis or dissertation, and
   e. Those done in conjunction with a graduate Plan B paper, which also satisfy 2.a, 2.b, or 2.c above.

Authority: M. Rao, President

History: 1992, 6/26/95

Indexed as: Plagiarism; Fabrication; Falsification; Misappropriation of Funds; Improper Assignment of Authorship; Inventorship

Except as noted above, this policy does not apply to a student’s class assignments, independent study projects, Plan B papers, or directed research work that is not expected to be submitted for publication, presentation or sharing with a community of scholars other than the members of the class.

In cases where it is unclear whether this policy or a different university policy must be followed for an allegation of Research Misconduct against a student, the Vice Provost for Research shall have the responsibility for determining which policy shall apply.

3. The Vice Provost for Research is responsible for coordinating and implementing this Policy, disseminating this Policy to all faculty and to others involved in research or creative endeavors, maintaining all documents and records relating to this Policy, and obtaining and keeping current any and all assurances of compliance with federal and state regulations pertaining to Research Misconduct. The Vice Provost for Research may rely upon the services of other CMU administrative staff as necessary to implement this Policy.

4. In addition to cases involving Research Misconduct, this Policy may, in the discretion of either the Vice Provost for Research or Provost, be used to review allegations of possible noncompliance with legal and ethical standards applicable to the use of human subjects, animals, recombinant DNA in research, and other regulated research activities.
5. Particular circumstances in individual cases may dictate variation from the usual procedures when deemed to be in the best interests of CMU and/or required by relevant federal regulations or agency procedures. Any significant variation from this Policy and associated procedures must be approved in advance by both the Provost and General Counsel.

6. Nothing in this policy is intended to diminish or waive an individual’s rights under any applicable collective bargaining agreement to which CMU is a party, or other university policies and procedures.

7. Except as stated explicitly herein, nothing in this policy is intended to diminish or waive CMU’s rights to conduct its inquiry/investigation into an allegation of Research Misconduct.

II. Definitions

A. *Complainant* means the individual(s) who submits an allegation of Research Misconduct.

B. *Dean* means the Dean of any academic college of CMU, the Dean of Students, the Dean of Libraries, the Vice President and Executive Director of ProfEd, or an equivalent senior officer in instances of a Complaint against an individual or individuals outside an academic college, or his or her designee.

C. *Good Faith*, as applied to a Complainant or witness, means having a belief in the truth of one’s allegations or statements that a reasonable person in the Complainant’s or witness’s position could have based on the information known to the Complainant or witness at the time. An allegation or statement is not in good faith if made with knowing or reckless disregard for information that would negate the allegation or statement. Good Faith, as applied to an Investigation committee member, means cooperating with the research misconduct proceeding by carrying out the duties assigned impartially for the purpose of helping CMU meet its responsibilities under this Policy. A committee member does not act in good faith if his or her acts on the committee are dishonest or influenced by personal, professional, or financial conflicts of interest.

D. *HHS* means the U.S. Department of Health and Human Services, the parent agency of the Public Health Service (“PHS”) and the National Institutes of Health (“NIH”).

E. *Inquiry* means preliminary information-gathering and preliminary fact-finding to determine whether an allegation or apparent instance of Research Misconduct has substance and if an Investigation is warranted.

F. *Investigation* means the formal development of a factual record and the examination of that record leading to a finding with respect to Research Misconduct.

G. *NSF* means the National Science Foundation.
H. **Office of Research Integrity or ORI** means the office to which the Secretary of Health and Human Services has delegated responsibility for addressing research integrity and misconduct issues related to Public Health Service activities.

I. **Preponderance of the Evidence** means proof by information that, compared with the information opposing it, leads to the conclusion that the fact at issue is more probably true than not.

J. **Research Misconduct** means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. CMU also defines Research Misconduct to include: misappropriation of funds pertaining to research; improper assignment of authorship or inventorship; failure to appropriately collect, maintain or protect Research Records; or other practices that seriously deviate from those that are commonly accepted by members of the wider relevant research discipline for proposing, conducting or reporting research and creative endeavors, including but not limited to failure to receive approval from, or failure to adhere to protocols approved by, the CMU Institutional Review Board, Institutional Animal Care and Use Committee, or Institutional Biosafety Committee. It does not include honest error or differences of opinion. A finding of Research Misconduct requires that the misconduct be committed intentionally, knowingly, or recklessly.

1. **Fabrication** is making up data or results and recording or reporting them.

2. **Falsification** is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the Research Record.

3. **Plagiarism** is the appropriation of another person’s ideas, processes, results or words without giving them appropriate credit.

4. **Misappropriation of Funds** is the use of research funds (a) for purposes not appropriately related to the supported research or (b) in ways prohibited by the internal or external funding source.

5. **Improper Assignment of Authorship or Inventorship** is:

   a. excluding as authors or inventors individuals who have made an identifiable, substantive contribution to a work, when such exclusion is inconsistent with the accepted standards of the relevant discipline or with patent law;

   b. including as authors or inventors individuals who have not made an identifiable, substantive contribution to a work, when such inclusion is inconsistent with the accepted standards of the relevant discipline or with patent law;

   c. submitting publications without the concurrence of all authors;

   d. claiming the work of another person as one’s own; or
e. presenting one's own work in substantially the same way in more than one publication or venue without proper acknowledgement of any prior presentation.

6. **Failure to Appropriately Collect, Maintain or Protect Research Records** is the destruction, absence of, or Respondent's failure to provide Research Records adequately documenting the questioned research.

K. *Research Record* or *Record* means any data, document, computer file, compact disc, computer diskette, or any other written or non-written account or object that reasonably may be expected to provide evidence or information regarding the proposed, conducted, or reported research. A Research Record includes, but is not limited to, grant or contract applications, whether funded or unfunded; grant or contract progress and other reports; laboratory note books; notes; correspondence; videos; photographs; X-ray film; slides; biological materials; computer files and printouts; manuscripts and publications; equipment use logs; laboratory procurement records; animal facility records; human and animal subject protocols; consent forms; medical charts; and patient research files.

L. *Respondent* means the person against whom an allegation of Research Misconduct is directed or who is the subject of a Research Misconduct proceeding.

M. *Retaliation* means an adverse action taken against a Complainant, witness, or committee member by CMU or one of its employees or students in response to a Good Faith allegation of Research Misconduct or Good Faith cooperation with a Research Misconduct proceeding.

**III. General Procedures and Principles**

A. **Responsibility to Report Misconduct**

Individuals subject to this Policy who become aware of a possible incident of Research Misconduct shall immediately report the information in the manner described in Section IV.A below.

B. **Confidentiality**

Allegations of Research Misconduct, and proceedings conducted under this Policy, may be damaging to the professional reputations of persons involved. Accordingly, persons subject to this Policy who make, receive, or learn of an allegation of Research Misconduct shall protect, to the maximum extent possible, the confidentiality of information regarding the Complainant, the Respondent, and other affected individuals.

Federal regulations state that "Disclosure of the identity of respondents and complainants in research misconduct proceedings is limited, to the extent possible, to those who need to know, consistent with a thorough, competent, objective and fair research misconduct proceeding, and as allowed by law."
Accordingly, CMU will make an effort to protect the disclosure of the identity of the Complainant and Respondent during the Inquiry to the extent permitted by law. However, if the matter is referred to an Investigation Committee and the Complainant’s testimony is required or if ORI conducts a review of the Research Misconduct proceedings in question, anonymity may no longer be possible.

The Vice Provost for Research may establish reasonable conditions to ensure the confidentiality of such information.

C. **Protecting the Complainant**

Persons subject to this Policy who receive or learn of an allegation of Research Misconduct shall treat the Complainant with fairness and respect and shall take reasonable steps to protect the position and reputation of the Complainant and other individuals who cooperate with the Inquiry or Investigation against Retaliation. Any alleged or apparent Retaliation should be reported to the Vice Provost for Research.

D. **Protecting the Respondent**

Persons subject to this Policy who receive or learn of an allegation of Research Misconduct shall treat the Respondent with fairness and respect and shall take reasonable steps to ensure that these procedures are followed. When a Respondent has been exonerated, CMU shall make reasonable efforts to restore his or her reputation, to the extent that harm may have been done. This may be accomplished through communication with members of the academic community who are aware of the matter, publicizing the final outcome in forums in which the allegation of Research Misconduct was previously publicized, expunging references to the allegations from Respondent’s personnel file, or through other steps worked out in coordination with the Respondent.

E. **Responding to Allegations**

In responding to allegations of Research Misconduct, the Vice Provost for Research and any other CMU official with an assigned responsibility for handling such allegations shall take immediate steps and make diligent efforts to ensure that the following functions are performed:

1. Any assessment, Inquiry, or Investigation is conducted in a timely, objective, thorough, and competent manner.

2. The Associate Vice Provost for Faculty Personnel Services is notified, where the allegation involves a CMU faculty member. The Director of Employee Relations/HR is notified where the allegation involves a CMU staff member.
3. Reasonable precautions are taken to avoid bias and real or apparent conflicts of interest on the part of those involved in conducting the Inquiry or Investigation. Specifically, reasonable steps shall be taken to ensure that the Vice Provost for Research, members of Investigation Committees, and experts have no bias and no personal, professional or financial conflict of interest with the Respondent, Complainant, or the case in question. In making this determination, consideration shall be given to whether the individual (or any members of his or her immediate family) has any of the following involvements with the Respondent or Complainant: financial involvement; coauthor on a publication; collaborator or co-investigator; party to a scientific controversy; supervisory or mentor relationship; other special relationship such as a close personal friendship, kinship, or a clinician/client relationship. Consideration shall also be given to whether there is any other circumstance that might appear to compromise the individual’s objectivity in reviewing the allegations.

4. Immediate notification is provided to ORI (in cases involving PHS–funded research) and/or other federal research sponsors supporting the research in question (to the extent required by those sponsors’ regulations) if:

   a. the health or safety of the public is at risk, including an immediate need to protect human or animal subjects.

   b. HHS or other federal resources or interests are threatened.

   c. research activities should be suspended.

   d. there is reasonable indication of possible violations of civil or criminal law.

   e. federal action is required to protect the interests of those involved in the research misconduct proceeding.

   f. CMU believes the research misconduct proceeding may be made public prematurely so that appropriate steps may be taken to safeguard evidence and protect the rights of those involved.

   g. the research community or public should be informed.

   h. there is an immediate need to protect the interests of the Complainant or Respondent as well as his/her co-investigators and associates, if any; or

   i. the allegation involves an issue that could be publicly sensitive, e.g., a clinical trial.

5. Immediate notification is provided to CMU bodies charged with ensuring compliance with research regulations (e.g., the Institutional Review Board, Institutional Biosafety Committee and the Institutional Animal Care and Use Committee), non–federal research sponsors, and other third parties, when such notification is deemed to be warranted by the Vice Provost for Research.
6. Interim administrative actions are taken, as appropriate, to protect federal funds and the public good and interest, and to ensure that the purposes of the federal financial assistance are carried out.

F. Cooperation by Persons Subject to Policy

Persons subject to this Policy, as defined in Section I.B, are expected to cooperate fully with the Vice Provost for Research and other CMU officials in the review of allegations and the conduct of Inquiries and Investigations. Employees and students are expected to disclose any and all evidence within their possession or knowledge to the Vice Provost for Research or other CMU officials on Research Misconduct allegations. Further, CMU officials, employees and students shall cooperate fully and completely with federal research sponsors in their conduct of Inquiries and Investigations, their oversight of CMU Inquiries and Investigations, and any follow up actions.

G. Access to Attorneys and Advisers and Additional Representation

Respondents may consult with their own legal counsel or non-lawyer personal adviser (who is not a participant or witness in the case) to seek advice, but, except as provided in a collective bargaining contract, employee handbook or student code of conduct, such counsel or adviser shall not participate in meetings with the Vice Provost for Research or Investigation Committee without the prior approval of the Vice Provost for Research.

Where the Respondent is a member of a collective bargaining unit, in a case under this Policy he/she shall have the right to have a representative of the applicable collective bargaining unit present during interviews in which he/she may be asked or required to be involved, as provided under the applicable collective bargaining Agreement.

H. Evidentiary Standards

In accordance with federal regulations, the following standards and burdens of proof apply to findings of Research Misconduct under this Policy:

1. Burden of Proof –

   a. CMU has the burden of proof for making a finding of Research Misconduct.

   b. The Respondent has the burden of proving any affirmative defenses, including honest error or differences of opinion, and of proving any mitigating factors that the Respondent wants the Vice Provost for Research or Investigation Committee to consider. Regardless of whether the Respondent carries her/his burden of proving honest error or difference of opinion, evidence submitted by the Respondent on that issue shall be considered in determining whether a finding of Research Misconduct has been established.
2. **Standard of Proof** -- A finding of Research Misconduct must be established by a Preponderance of the Evidence.

3. **Absence of Records** – The destruction, absence of, or Respondent’s failure to provide Research Records adequately documenting the questioned research is evidence of Research Misconduct where it is established by a Preponderance of the Evidence that the Respondent intentionally, knowingly, or recklessly had research records and destroyed them, had the opportunity to create and/or maintain the records but did not do so, or maintained the records and failed to produce them in a timely manner, and that the Respondent’s conduct constitutes a significant departure from accepted practices of the wider relevant research discipline.

I. **Allegations Not Made in Good Faith**

   If at any time an Investigation Committee determines that an allegation of Research Misconduct was not made in Good Faith, it shall report its determination to the Vice Provost for Research. If the Vice Provost for Research, independently or on the basis of an Inquiry or on the basis of a report from an Investigation Committee, determines that an allegation of Research Misconduct was not made in Good Faith, he or she shall determine, after consultation with other appropriate senior administrators, in particular those in Faculty Personnel Services and/or Employee Relations, whether any employment or disciplinary action should be initiated against the Complainant. Where employment or disciplinary action is initiated, the immediate supervisor shall become involved.

J. **Early Termination of Proceedings**

   If the matter involves federal research support and CMU plans to terminate an Inquiry or Investigation prior to completion of all the steps required by this Policy, the Vice Provost for Research shall notify responsible federal authorities of the planned termination and the reasons therefore.

K. **Referral of Non-Research Misconduct Issues**

   When the review of the allegation identifies possible misconduct that is not a violation of this Policy, the Vice Provost for Research shall refer these matters to the proper CMU or governmental authority for action. Complaints against a member of the CMU regular faculty are handled according to processes described in the collective bargaining Agreement. Complaints against other CMU employees are subject to processes described in applicable union contracts, and/or policy documents, or Handbooks.

L. **Reporting Requirements**

   Certain federal research sponsors, such as HHS/PHS and NSF, require the reporting of significant actions in research misconduct matters, such as the institution's decision to initiate an Investigation, the institution’s determination that it will not be able to complete an Inquiry or Investigation in the time specified under federal regulations, or the closing of a case on the
basis that the Respondent has admitted Research Misconduct. The Vice Provost for Research, in consultation with the Office of the General Counsel, shall comply with such reporting requirements.

In addition, the Vice Provost for Research shall report significant actions in research misconduct matters to CMU bodies charged with ensuring compliance with research regulations (e.g., the Institutional Review Board, Institutional Biosafety Committee and the Institutional Animal Care and Use Committee), non-federal research sponsors, and other third parties, when he or she deems such notification to be warranted.

M. Record Retention

Records of Research Misconduct proceedings (including records of assessments and Inquiries that do not lead to Investigation) shall be retained for seven years after completion of proceedings, or such longer time period as may be required by the responsible federal agency.

IV. Submission of Allegations

A. Submission of Allegations

Any individual who in Good Faith suspects that a person subject to this policy is committing or has committed Research Misconduct shall immediately report the information to (1) the Vice Provost for Research or (2) any of the following, who shall immediately report the information to the Vice Provost for Research: the Office of Research and Sponsored Programs, the Office of the General Counsel, Internal Auditor, the individual’s department chair, or any faculty member or administrator who supervises the individual. The Vice Provost for Research or any individual or member of an office named above who receives a verbal allegation of Research Misconduct shall summarize the allegation in writing, and make that summary available to the Vice Provost for Research. The Vice Provost for Research shall notify the supervisor of the person against whom an allegation has been made and, in cases involving externally-sponsored research, appropriate staff of the Office of Research and Sponsored Programs. (Where an allegation has been made against a member of the CMU faculty, the supervisor to whom notice shall be made is the Dean of the applicable College.) The Vice Provost for Research shall initiate the process for assessment of the allegations, to include Faculty Personnel Services where Respondent is a member of the CMU faculty, and the Director of Employee Relations/HR where Respondent is a CMU staff member as described below.

B. Submission of Allegations Involving the Vice Provost for Research

Allegations involving the Vice Provost for Research shall be submitted to the Provost. In any case involving the Vice Provost for Research, the Provost or his or her designee shall carry out the responsibilities assigned to the Vice Provost for Research under this Policy.
C. Submission of Allegations Involving the Provost

Allegations involving the Provost shall be submitted to the President. In any case involving the Provost, the President or his or her designee shall carry out the responsibilities assigned to the Vice Provost for Research under this Policy.

D. Submission of Allegations Involving the President

Allegations involving the President shall be submitted to the Chair of the Board of Trustees. In any case involving the President, the Chair of the Board of Trustees shall designate an outside party to carry out the responsibilities assigned to the Vice Provost for Research under this Policy.

E. Submission of Allegations Involving a Dean

Allegations against a Dean shall be submitted to the Provost, and the Provost or her/his designee shall appoint an individual to carry out the responsibilities assigned to the Dean under this Policy.

V. Inquiry

A. Preliminary Assessment of Allegations to Determine if Inquiry is Warranted

1. Upon receiving an allegation of Research Misconduct, the Vice Provost for Research and the responsible Dean shall, within 15 business days and without notice to any of the parties involved, consult with one another, and Faculty Personnel Services where respondent is a member of the faculty or Employee Relations/HR where respondent is a staff member to determine whether an Inquiry is warranted. If they are unable to agree on whether an Inquiry is warranted, the Provost shall determine whether an Inquiry is warranted.

2. An Inquiry is warranted if the allegation --

   a. Falls within the definition of Research Misconduct under this Policy; and

   b. Is sufficiently credible and specific, with a reasonable likelihood that potential evidence of Research Misconduct may be identified.

3. There is not always sufficient information to warrant an Inquiry of an allegation. For example, an allegation that a researcher's work should be subjected to general examination for possible misconduct is not sufficiently substantial or specific to initiate an Inquiry. In the case of such a vague allegation, before initiating an Inquiry, the Vice Provost for Research must make an effort to obtain more and specific information from the Complainant, where the Complainant is known.

4. Anonymous allegations of Research Misconduct will be considered only if sufficient evidence is provided, in the judgment of the Vice Provost for Research and Dean, to warrant Inquiry of the allegations.
5. If it is determined that an Inquiry is warranted, the Vice Provost for Research shall implement the procedures described in Sections V.B through V.K below.

B. Sequestration of Research Records

1. *Immediate Sequestration* -- The Vice Provost for Research shall immediately locate, collect, inventory, and secure the relevant Research Records to prevent the loss, alteration, or fraudulent creation of those records. In addition to securing records under the control of the Respondent (see below), the Vice Provost for Research may need to sequester records from other individuals, such as coauthors, collaborators, or Complainants. Where relevant records may be in the possession of Respondent, and Respondent is a member of the CMU regular faculty, the Vice Provost for Research must ensure compliance with the CMU–CMU Faculty Association collective bargaining Agreement insofar as obtaining those records is concerned.

2. *Sequestration of Records from Respondent* -- The Vice Provost for Research shall notify the Respondent that an Inquiry is being initiated simultaneously with, and in any event no earlier than, the sequestration to prevent questions being raised later regarding missing documents or materials and to prevent accusations against the Respondent of tampering with or fabricating data or materials after the notification. The Vice Provost for Research shall obtain the assistance of the Respondent’s supervisor, the Associate Vice Provost for Faculty Personnel Services or Director of Employee Relations/HR and the General Counsel in this process, as necessary. If the Respondent is not available, sequestration may begin in the Respondent’s absence.

3. *Inventory of the Records* -- A dated receipt shall be signed by the sequestering official and the person from whom Research Records are collected, and a copy of the receipt shall be given to the person from whom such records are taken. If it is not possible to prepare a complete inventory list at the time of collection, one should be prepared as soon as possible, and then a copy should be given to the person from whom the Research Records were collected. As soon as practicable, a copy of each sequestered Record should be provided to the individual from whom the Record is taken, if requested. Where the Research Records constitute scientific instruments or other materials shared by a number of users, custody may be limited to copies of the data or evidence on such instruments, or copies of the other materials, so long as those copies are substantially equivalent to the originals.

4. *Security of Records* -- The Vice Provost for Research shall keep original Research Records in a secure place. Upon request, and to the extent feasible, the persons from whom Records are collected may be given access to their own original Records under the direct and continuous supervision of a CMU official. Questions about maintaining the security of records should be addressed to the General Counsel.
5. **Data Retention Policy** -- Persons subject to this Policy are reminded of CMU's Data Retention Policy which requires, among other things, that research data generated while individuals are pursuing research studies as faculty, staff, or students of CMU, and data generated by visiting scholars utilizing the facilities of CMU, are to be retained by the institution for a period of three (3) years after submission of the final report on the research project for which the data were collected, unless a longer period is specified by the sponsor. See http://www.ia.cmich.edu/recordretention.htm

C. **Use of Experts**

The Vice Provost for Research may consult with experts during the Inquiry to provide special expertise regarding the analysis of evidence. The Vice Provost for Research shall ensure such experts do not have real or apparent conflicts of interest in the case, are unbiased, and have the necessary expertise to evaluate the evidence and issues related to the allegation. If consulted, such experts shall provide a strictly advisory function. At the request of the Vice Provost for Research, they may interview witnesses and participate in deliberations with University officials. The experts chosen may be from inside or outside CMU; and shall be chosen solely at the discretion of CMU.

D. **Notification of Respondent**

The Vice Provost for Research shall notify the Respondent in writing of the opening of the Inquiry. The notification to the Respondent must at a minimum: (a) identify the research project in question and the specific allegations; (b) provide a copy of this Policy; (c) refer to the definition of Research Misconduct; (d) identify any internal or external funding involved; (e) describe CMU's policy on protecting the Complainant against retaliation; and (f) describe the need to maintain confidentiality during the Inquiry and any subsequent proceedings. At CMU's discretion, the notification to the Respondent may, in addition: (a) provide a copy of the allegation(s) and invite the Respondent to respond; (b) explain the Respondent's opportunity to be interviewed, with or without a union representative present, at her/his choosing, if respondent is a member of a union, to present evidence to the Vice Provost for Research and to comment on the draft Inquiry report; and (c) address the Respondent's obligation to cooperate in the Inquiry and any subsequent proceedings.

E. **Purpose of Inquiry; Criteria Warranting Investigation**

1. The purpose of an Inquiry is to conduct an initial review of the evidence to determine whether or not to conduct an Investigation. Therefore, an Inquiry does not require a full review of all the evidence related to the allegations.

2. An Investigation is warranted if there is:
a. a reasonable basis for concluding that the allegations fall within the definition of Research Misconduct under this Policy; and

b. preliminary information-gathering and preliminary fact-finding from the Inquiry indicates that the allegations may have substance.

F. Inquiry Process

The Vice Provost for Research and/or his/her designee shall examine all relevant Research Records and materials in CMU’s possession, and make a determination whether or not to interview the Complainant, the Respondent, and key witnesses. Supervised access to any relevant data and/or documents should be available to the Respondent, but may only be made available upon the written authorization of the Vice Provost for Research. Witness interviews shall be summarized in writing by the Vice Provost for Research or appropriate staff; and witnesses given the opportunity to review and correct such summaries of their own statements.

G. Time for Completion of Inquiry

The Inquiry must be completed within 60 calendar days from the date on which the Vice Provost for Research notifies the Respondent of the opening of the Inquiry (see D, above) unless circumstances clearly warrant a longer period and the Provost approves an extension.

H. Inquiry Report

1. The Vice Provost for Research must prepare a written report that includes at least the following elements:

   a. The name and position of the Respondent;

   b. A description of the allegations of Research Misconduct;

   c. A description of any internal or external support for the research giving rise to the allegations, including, for example, grant and contract numbers and references to grant applications;

   d. References for any publications involving the research in question;

   e. Any comments on the report by the Respondent;

   f. A recommendation as to whether an Investigation is warranted, and a statement of the basis for this recommendation.

2. The Respondent shall be provided with a draft of the Inquiry report and shall have 10 calendar days to provide written comments on it. The Vice Provost for Research may also make relevant portions of the report available to the Complainant and/or witnesses (but not give them a copy), for comment. In preparing his or her final report, the Vice Provost for Research shall consider and attach any comments made by the Respondent (and by the Complainant and/or witnesses, if applicable) on the draft Inquiry report.
I. Notice of Results of Inquiry; Report to Federal Authorities

The Vice Provost for Research shall notify the Respondent and appropriate CMU officials in writing of his or her decision whether to proceed to an Investigation. The notice to the Respondent must include a copy of the Inquiry Report. The Vice Provost for Research may, when appropriate, notify the Complainant whether an investigation will take place. To the extent required by federal regulation, the Vice Provost for Research shall provide notice to federal authorities concerning the Inquiry and the decision whether an Investigation is warranted. The Vice Provost for Research shall also notify CMU bodies charged with ensuring compliance with research regulations (e.g., the Institutional Review Board, Institutional Biosafety Committee and the Institutional Animal Care and Use Committee), non-federal research sponsors, and other third parties of his or her decision whether to proceed to an Investigation when he or she deems such notification to be warranted.

J. Restoration of Respondent’s Reputation Where Investigation Is Not Warranted

In cases where it is determined that Investigation is not warranted, and where Respondent’s reputation has been harmed, the Respondent shall be given an opportunity to meet with the Provost to discuss how the Respondent’s record shall be cleared and what reasonable efforts will be taken to restore the Respondent’s reputation. See Section III.D.

K. Documentation of Decision Not to Investigate

In the event that the Vice Provost for Research decides not to conduct an Investigation, he/she shall keep sufficiently detailed documentation of the inquiry to permit a later assessment by ORI of the reasons why CMU decided not to conduct an investigation. Such documentation and related records shall be kept in a secure manner for at least seven (7) years after the termination of the inquiry, and upon request, shall be provided to ORI or other authorized HHS personnel.

VI. Investigation

A. Designation of Investigation Committee; Use of Outside Experts

1. If the Vice Provost for Research determines that an Investigation is warranted, he or she shall inform the Provost (and Associate Vice Provost, Faculty Personnel Services, where the Respondent is a member of the CMU faculty or Director of Employee Relations/HR where Respondent is a CMU staff member) of such finding. Within 15 business days after such notification, the Provost shall cause an Investigation Committee to be appointed to explore the allegations in detail, to examine the evidence in depth, and to determine specifically whether Research Misconduct has been committed. In so doing, the Provost or his/her designee shall take reasonable steps to ensure an impartial and unbiased investigation to the maximum extent practicable, including participation of persons with appropriate professional expertise who do not have unresolved personal, professional, or financial conflicts of interest with those involved with the investigation.
2. For cases in which the Respondent is a regular faculty member, the Investigation will be co-ordinated according to processes outlined in the collective bargaining Agreement between CMU and the CMU Faculty Association. For cases in which the Respondent is a student, a person holding an academic appointment or a staff member in an academic unit, the Provost shall make appointments to the Investigation Committee in consultation with the responsible Dean. In other cases, the Provost shall make appointments to the Investigation Committee in consultation with the responsible Vice President or responsible senior officer.

3. The Investigation Committee shall consist of at least three individuals who do not have real or apparent conflicts of interest in the case, are unbiased, and have the necessary expertise to search for and evaluate the evidence and issues related to the allegation, interview the principals and key witnesses, and conduct the Investigation, one of which is assigned by Faculty Personnel Services or Human Resources as appropriate. These individuals may be scientists, administrators, subject matter experts, lawyers, or other qualified persons, and they may be from inside or outside CMU. The Provost shall appoint one of the members to serve as chair. In addition to the three Investigation Committee members, the Vice Provost for Research or his/her designee shall serve as recording secretary and be responsible for maintaining committee minutes and detailed records of all documentary evidence.

4. If there is an allegation involving individuals from different employment classifications and/or students, the Provost shall confer with the appropriate Deans or other responsible officers listed above and determine a single, coordinated process for conducting the Investigation.

5. The Investigation Committee shall determine whether experts other than those appointed to the committee ought to be consulted during the Investigation to provide special expertise regarding the analysis of evidence. If consulted, such experts shall provide a strictly advisory function to the committee. At the request of the chair, they may interview witnesses and participate in committee deliberations, but they may not otherwise help to determine the outcome of the Investigation. The experts chosen may be from inside or outside of CMU.

B. Investigation Process

In conducting its Investigation, the Investigation Committee shall:

1. Diligently ensure that the Investigation is thorough and sufficiently documented and includes a search for and examination of all Research Records and evidence relevant to reaching a decision on the merits of the allegations;

2. Interview each Respondent, Complainant, and any other available person who has been reasonably identified as having information regarding any relevant aspects of the Investigation, including witnesses identified by the Respondent, and maintain detailed records.
The Committee shall record or transcribe each interview, provide the recording or transcript to the interviewee for confirmation and/or correction, and include the recording or transcript in the record of the Investigation; and

3. Diligently pursue all significant issues and leads discovered, including any evidence of additional instances of possible Research Misconduct, and continue the Investigation to completion.

C. Time Limit for Completing Investigation

The Investigation Committee shall use its best efforts to complete all aspects of the Investigation described in Section VI within 90 calendar days. If the Committee is unable to complete the Investigation within 90 calendar days, the chair shall ask the Provost for an extension of time. An extension may require approval of the responsible federal agency. For example, in cases involving PHS-funded research, it is necessary to obtain ORI approval to extend the Investigation beyond 90 calendar days. (See Code of Federal Regulations, 42, Sec. 93.311)

D. Investigation Report

1. The Investigation Report shall contain the same type of information as the Inquiry Report regarding the nature of the allegations, sources of internal and external support, and Research Records and evidence reviewed. In addition, the Investigation Report shall provide, for each separate allegation of Research Misconduct identified during the Investigation, a finding as to whether Research Misconduct did or did not occur, and if so:

   a. identify the person(s) responsible for the misconduct;

   b. identify whether the Research Misconduct was falsification, fabrication, plagiarism, misappropriation of funds, improper assignment of authorship or inventorship, failure to appropriately collect, maintain or protect Research Records, or other practices, and whether it was intentional, knowing, or reckless;

   c. summarize the facts and the analysis that support the conclusion and consider the merits of any reasonable explanation by the Respondent;

   d. identify the specific external support involved, if any;

   e. identify whether any publications or other public disclosures need corrections or retraction; and

   f. list any current support or known applications or proposals for support that the Respondent has pending with external sponsors, regardless of their relationship to the misconduct.
2. The Respondent shall be provided with a draft of the Investigation Committee report and concurrently a copy of, or supervised access to, the evidence on which the report is based. The Respondent shall have 30 calendar days after receipt of the draft report to provide written comments on it. The Investigation Committee may also make relevant portions of the report available to the Complainant and/or witnesses (but not give them a copy), for comment. The Committee shall, in preparing its final report, consider and attach any comments made by the Respondent (and by the Complainant and/or witnesses, if applicable) on the draft Investigation Report.

3. The chair of the Investigation Committee shall forward copies of the final Investigation Report to the Provost and the Respondent. Following submission of the Investigation Report to the Provost and the Respondent, no additional evidence may be introduced into the record as a matter of course.

E. Notification of Outside Parties

Upon receipt of the Investigation Report, the Provost shall, as appropriate, forward copies to the responsible federal agencies, other external sponsors, law enforcement agencies, CMU bodies charged with ensuring compliance with research regulations (e.g., the Institutional Review Board, Institutional Biosafety Committee and the Institutional Animal Care and Use Committee), professional societies, professional licensing boards, patent offices, journals, collaborators of the Respondent, or other parties with a legitimate need to know the outcome of the proceeding.

VII. CMU Administrative Action as a Result of Investigation

A. A Finding of Research Misconduct

If the Investigation Committee determines that Research Misconduct occurred, the Provost, in consultation with the Dean, Faculty Personnel Services or Human Resources as appropriate and other responsible CMU officials, shall determine the appropriate actions to be taken according to applicable CMU disciplinary procedures for faculty, staff, and students. The recommended actions, a copy of which shall be provided in writing to the Respondent, may include, but are not limited to:

1. Withdrawal or correction of all pending or published abstracts and papers emanating from the research where Research Misconduct was found.

2. Notification to professional organizations.

3. Removal of the Respondent from the particular project, letter of reprimand, special monitoring of future work, probation, suspension, salary reduction, rank reduction or termination of employment.
4. Denial of access to university research funds.

5. Restitution of funds as appropriate.

B. A Finding of Absence of Research Misconduct

If the Investigation Committee determines that no Research Misconduct occurred, the Respondent shall meet with the Provost to discuss how the Respondent’s record shall be cleared and what reasonable efforts will be taken to restore the Respondent’s reputation. See Section III.D.

VIII. Review of CMU Administrative Action

Respondent may challenge a CMU administrative action taken under this Policy according to provisions in existing collective bargaining Agreements, or under University policy. Where the challenge is in regard to a finding of Research Misconduct involving PHS–supported research and a resolution of the challenge is anticipated reasonably to take more than 120 calendar days, the Provost will make known to ORI the need for more time to complete the resolution process.

IX. Other Considerations

If the Respondent, without admitting to misconduct, elects to resign his or her position after an allegation of Research Misconduct has been received, proceedings under this Policy shall continue. If the Respondent refuses to participate in the process after resignation, the Vice Provost for Research and/or Investigation Committee shall use its best efforts to reach a conclusion concerning the allegations, noting in its report the Respondent’s failure to cooperate and its effect on the review of the matter.

Acknowledgement

This policy is a revision of Dartmouth College’s Research Misconduct policy, approved by the Dartmouth College Board of Trustees on June 10, 2005. We thank the staff of the Office of Sponsored Projects at Dartmouth College for giving permission to extensively borrow from their policy.

Central Michigan University reserves the right to make exceptions to, modify or eliminate this policy and/or its content. This document supersedes all previous policies, procedures or guidelines relative to this subject.
References


- Defined terms are capitalized throughout this document.

- Code of Federal Regulations, Title 42, Part 93, Sec. 108(a).


- For Example, for PHS–funded research, regulations require that institutions provide ORI the written finding of the Vice Provost for research and a copy of the inquiry report within 30 days of any inquiry finding that an investigation is warranted. (Code of Federal Regulations Vol. 42, Sec. 93.903)
Important Contact Information

Career Services
Bovee University Center 215
Phone: (989) 774–3068
E-mail: www.careers.cmich.edu

Student Disability Services
Park Library 120
Phone: (989) 774–3018
E-mail: www.cmich.edu/student-disability/

Counseling Center
Foust Hall 102
Phone: (989) 774–3881
E-mail: www.counsel.cmich.edu

University Health Services
Foust Hall
Phone: (989) 774–6599
E-mail: www.healthservices.cmich.edu

Minority Student Services
Bovee University Center 121
Phone: (989) 774–3945
E-mail: www.diversity.cmich.edu/mss

Sources of Information within this Handbook

Central Michigan University—Department of Biology—http://www.bio.cmich.edu/default.htm

Central Michigan University—Department of Psychology—http://www.chsbs.cmich.edu/Psychology/

Central Michigan University—Office of Research and Sponsored Programs—
http://www.orsp.cmich.edu/

College of Graduate Studies 2008–2009 GRADUATE BULLETIN—https://bulletins.cmich.edu/

Central Michigan University 2008—2009 UNDERGRADUATE BULLETIN—https://bulletins.cmich.edu/