

# Welcome to the Translational Neuroscience Program - TNP

The vision of the TNP program at WSU is to inspire a new generation of biomedical investigators that is highly trained in interdisciplinary science and focused on understanding basic neural processes and function as well as improving the health and care of individuals affected by psychiatric and neurological disorders, or injuries in the nervous system through an understanding of neurobiological mechanisms. The program offers access to world-class facilities for both animal and human research enabling innovative technologies in neuroimaging, transgenic and knockout models of neurological conditions, neuropharmacological treatment interventions, brain stimulation, in brain network and computational modeling.

Our mission begins with a program that is inherently interdisciplinary with TNP faculty members specialized in basic, translational and clinical neuroscience. Students from diverse undergraduate backgrounds are exposed to a comprehensive, extensive and integrated bio-behavioral didactic curriculum. This includes courses in basic cellular, molecular and systems neurobiology, behavior and cognition, and neuroimaging. To earn a Ph.D. from the TNP, students are required to demonstrate proficiency in both conceptual and technical facets of modern biomedical research and to perform meritorious original neuroscience research on a significant and clinically relevant problem. The TNP program is fully committed to training basic and clinical neuroscientists who drive innovations to impact public health.

Specifically, the overall objectives of the TNP program include:

- Gain knowledge and understanding of basic sciences related to the neurobiology of the nervous system, brain disorders, diseases and injuries, fundamentals of neuroimaging techniques, and statistical approaches to modeling research data; all through a diverse didactic curriculum.
- Develop skills in oral and written communication, including writing an NIH predoctoral fellowship grant application, critiquing and challenging basic and clinical research findings through journal club and seminar participation, and creating and delivering oral and poster presentations of their research (e.g., at local, national and international scientific meetings, and TNP seminars).
- Design, develop and write a dissertation research prospectus with testable hypotheses and a rigorous experimental approach with guidance from an advisor and an advisory committee, conduct graduate-level research and exhibit advanced knowledge and expertise within their chosen research interest.

This handbook is a supplemental guide to the [Graduate School student handbook](#) for students who have elected to pursue their Ph.D. studies in the TNP. It is intended to reflect the spirit of our graduate training program and is not a legal document. That is, the TNP program cannot operate with a one-size fit-for-all approach because each student brings a level of uniqueness in his/her training and training environment. It may prove necessary to alter various requirements and/or procedures in response to future situations (e.g., changes in the policies of WSU Graduate School). The TNP steering committee will review the handbook periodically, and student input is welcomed.

## A. Overview of training timeline and milestones

Academic Y1-2:	Required coursework
Academic Y1-2:	Engage in research to develop the dissertation research project by conducting research rotations during Fall and Winter semesters, as well as during the summer
Academic Y1:	<p>Complete and submit the <a href="#">Plan of Work</a> to the Graduate School for approval</p> <p>An approved Plan of Work is a requirement for Ph.D. candidacy. Once a student has an approved Plan of Work on file with the Graduate School, any further changes are approved by the TNP Graduate Officer.</p>
Academic Y1:	Complete and submit an Individual Development Plan (IDP), which provides a structure to identify concrete steps toward long-term goals and a framework for constructive conversation between the student and advisor(s). This document must be <a href="#">submitted to the Graduate School</a> before the end of Year 1 and must be updated annually.
Academic Y2:	<p>Identify an advisor or co-advisors from the TNP faculty membership for the dissertation research project by mid-Academic Year 2.</p> <p>With guidance from the advisor(s) and the TNP Graduate Officer, students must identify members of the <a href="#">dissertation committee</a> and be pre-approved by the TNP Graduate Director (see TNP form).</p> <p>The dissertation committee is composed of four (or five) faculty members that includes the advisor (or advisors), one member from the TNP Steering committee, one (or two) member(s) with expertise relevant to the dissertation and one member with external expertise.</p> <p>If there are two co-advisors, then the committee must include 5 faculty members.</p> <p>The advisor (or one of the co-advisors) must have Graduate Faculty Status approved by the Graduate School.</p>
Academic Y2:	<p>Once a dissertation committee has been established, all students must present their dissertation research proposal and the plan of action for the NIH predoctoral fellowship application to the committee.</p> <p>The goal during Academic Y2 is to complete a draft of the Specific Aim page for the NIH predoctoral fellowship application and hold a first meeting with the committee for an oral presentation of the scope of the dissertation research project. Students MUST have a committee meeting prior to submitting the NIH F30/31 predoctoral fellowship application to present the application for review.</p>
Academic Y3:	As part of the written component requirement of the Qualifying Examination for Ph.D. students, or the requirement for M.D./Ph.D. students, all students must

write and submit an NIH F30/F31 predoctoral fellowship application (U.S. citizens only).

Annual submission deadlines are, December 8<sup>th</sup>, April 8<sup>th</sup> and August 8<sup>th</sup>. The expectation is for students to submit their predoctoral fellowship application for the December 8<sup>th</sup> deadline in Academic Year 3.

For non-U.S. citizens or U.S. residents, the predoctoral fellowship application will be submitted to the TNP Steering Committee for assessment by an external reviewer that is selected by the Steering committee.

Academic Y3: By the end of the Fall semester or beginning of the Winter semester, all students must pass their Qualifying Exam, which is a requirement for Ph.D. candidacy. See below for more information on the Qualifying Examination process.

The [Recommendation for Candidacy Status form](#) must be submitted to the Graduate School for the student to advance to candidacy.

If a student has completed all 60 credits of coursework and is not a candidate, PYC 9990 can be taken for up to 12 credits.

Academic Y3: Following the Qualifying Examination, all students must submit a [dissertation prospectus](#) document, approved by the dissertation committee, to the Graduate School.

Academic Y3 – Onward: A minimum of four consecutive academic-year semesters of registration as a Ph.D. candidate (PYC 9991, 9992, 9993, 9994) are required for completion of dissertation research. Students will not be given permission to register for PYC 9991 until they have had at least one committee meeting and a date scheduled for the Qualifying Exam. Students should have 1-2 meetings with their dissertation committee each year.

Academic Y4 – Onward: Dissertation preparation and defense.

With a minimum of two weeks prior to the Defense date, the dissertation thesis must be checked for plagiarism by the advisor and TNP form - Ph.D. Dissertation Uni-Check Certification – must be completed and signed, as well as submit the following forms to the Graduate School: [Dissertation title and list of previous degrees](#), [Final Report](#), [Electronic Thesis and Dissertation Permissions Form](#) and [Conflict of Interest](#).

All student must present their dissertation in a public lecture and defend their dissertation to the committee. The results of the defense are submitted to the Graduate School via the [Defense Final Report form](#).

The average time of completion of degree requirements for a TNP student is approximately 4.8 years. According to the Graduate School policy, the maximum time-to-degree is seven years. Under certain circumstances, an extension beyond seven years can be [requested](#) with a maximum time-to-degree of 12 years.

## B. Degree Requirements – courses, qualifying examination (prospectus) and defense

All students in the TNP program are required to complete a minimum of 90 credits beyond their baccalaureate degree, which includes 60 credits in coursework and 30 credits in dissertation research and preparation (PYC 9991, 9992, 9993, 9994). Completion of approximately 50 credits of coursework is a requirement for Ph.D. candidacy (i.e., passing the Qualifying Examination). The typical number of credits in a Plan of Work for a TNP student ranges from 93-96 credits.

All students in the TNP program are required to maintain at least a 3.0 grade point average (GPA) for all coursework. A maximum of one course for which a 'C' grade was earned may be applied toward graduation requirements, provided a 3.0 average is maintained. In addition, a maximum of 2 courses for which a 'C' or lower grade was received may be repeated with approval from the Advisor and Graduate Officer.

The required coursework for all TNP students includes the following:

- IBS 7015 Interdisciplinary Cell and Molecular Biology; Cr. 6
- PYC 7010 Neurobiology I; Cr. 3
- PSY 8060 Functional Neuroanatomy; Cr. 4
- PYC 7140 Fundamentals of Neuroimaging; Cr. 3
- PYC 7150 Fundamentals of Neuropsychiatric Disorders; Cr. 3
- GS 0900 Essential Research Practices: Responsible Conduct of Research; Cr. 0
- PYC 7998 Clinical Neuroscience Rotation; Cr. 3 [minimum 3]
- PYC 7996 Research Problems - laboratory rotations; Cr. 3 [minimum 9]

At least one course on statistics (however, an advance course in statistics is strongly encouraged):

- FPH 7015 Biostatistics I; Cr. 4
- FPH 7020 Biostatistics II; Cr. 3
- PSY 7150 Quantitative Methods in Psychology I; Cr. 4
- PSY 8150 Applied Multivariate Analysis in Psychology; Cr. 4 (prerequisite for PSY 7160)
- PYC 7890 Research Seminars (journal club); Cr. 1 [minimum 6 (4 for M.D./Ph.D. students) and maximum 8]
- PYC 7990 Directed Study; Cr. 1 - 6 [maximum 10]

One of the following IBS curriculum courses for 2 Cr.:

- IBS 7030 Functional Genomics and Systems Biology
- IBS 7050 Biomedical Neurobiology
- IBS 7090 Biomedical Immunology
- IBS 7100 Biomedical Neuropharmacology
- IBS 7130 Systems Neuroscience: Structure and Function of the Nervous System
- IBS 7330 Advanced Molecular Biology
- PYC 9990 Pre-Doctoral Candidacy Research is not required, but available, if needed; Cr. 1 - 8 [maximum 10]
- PYC 9991-4 Dissertation Research (30 credits maximum) Students are required to register for four semesters minimum at 7.5 credits per semester
- PYC 9995 Dissertation maintenance course (Cr. 0), if the dissertation is not completed in four semesters

Advanced Topic courses encompass neuroscience principles and methods, and their applications to nervous system disorders. These include any graduate level non-TNP required core courses. [12 Cr. minimum and 24 Cr. maximum]. Possible courses include, but are not limited to:

- BME 7720 MR Imaging of Neurovascular Disease; Cr. 3
- IBS 7140 Foundations of Computational Biology; Cr. 3
- PSY 7340 Neuropathology and Behavior; Cr. 3
- PSY 8065 Neurophysiology and Neural Plasticity; Cr. 3
- PSY 8170 Structural Equation Modeling; Cr. 3
- PSY 7160 Psychometrics and Factor Analysis; Cr. 3
- PYC 7515 Advanced Topics: Imaging, Neurodevelopment and Psychiatric Disorders; Cr. 3
- PYC 7500 Advanced Topics; Formal course with syllabus and well-defined outcome measures generated by an instructor(s) with potential input by students.

A maximum of 10 Cr. can be taken per Fall or Winter semester, with an optional 1-2 Cr. in the Spring/Summer semester.

As a graduate program with research as the main focus of training, it is expected that all students engage in research with their advisor during the Spring/Summer semester. This is viewed as protected time to prepare and conduct dissertation research, or work on the predoctoral fellowship grant application.

The Directed Study course (PYC 7990) is intended to provide guided instruction between instructor and student with identified outcome measures. This mechanism can be used to learn a new technique or delve deeper into a thesis-related concept. A TNP Directed Study form must be signed and approved by the instructor and the TNP Graduate Officer.

Students are required to seek advice from the Graduate Officer, on his/her course selection. All course work must be completed according to requirements of the [WSU Graduate School](#). The [WSU Graduate Bulletin](#) includes a complete listing and description of graduate courses offered at WSU.

Typical examples of a Plan of Work include the following:

Year 1 - Fall: 10 credits

- Interdisciplinary Cell and Molecular Biology - IBS 7015 (6 Cr.)
- Research Seminar - PYC 7890 (1 Cr.)
- Research Problems - PYC 7996(3 Cr.)

Year 1 - Winter: 10 credits

- Functional Neuroanatomy - PSY 8060 (4 Cr.)
- Research Problems - PYC 7996(3 Cr.)
- Neurobiology I - PYC 7010 (3 Cr.)

Year 2 - Fall: 10 credits

- Biostatistics I - FPH 7015 (4 Cr.)
- Fundamentals of Neuropsychiatric Disorders- PYC 7150 (3 Cr.)
- Research Problems - PYC 7996(3 Cr.)

Year 2 - Winter: 10 credits

Biostatistics II - FPH 7020 (3 Cr.)

Fundamentals of Neuroimaging - PYC 7140 (3 Cr.)

Research seminar - PYC 7890 (1 Cr.)

Directed Study- PYC 7990 (3 Cr.)

### **C. Workload and Vacation**

The official policy from the Graduate School is that students with a GRA, which applies to all TNP students, do not accrue vacation time. The TNP program does not enforce this policy, but we want to ensure that there is no abuse of excessive time away from your training. Therefore, all students must receive prior approval for any "vacation time" in writing by their advisor (or the Graduate Officer, if advisor has not been identified). This implies that the advisor has the final say in approving the time away from your training.

### **D. Research**

Lab Rotations - Students are expected to complete at least four lab research rotations - course PYC 7996: Research Problems - within the first two years. Each rotation represents 3 contact/credit hours, totaling 90-120 hours/semester. Additionally, one clinical rotation, course PYC 7998 - Clinical Neuroscience Rotation, must be completed during the training, which is typically taken after the passing of the qualifying exam.

Meetings between student and dissertation committee must occur at least annually or when deemed necessary. As the student progresses towards defense of the dissertation, this frequency should increase to twice annually. The student must reach an agreement with the thesis committee as to when to shift focus to dissertation writing and on the outline of the dissertation thesis.

### **Qualifying Examination and Ph.D. Candidacy**

The final Qualifying Examination determines whether the student has an adequate command of knowledge in the field of study and can organize, apply and convey that knowledge. The examination covers the applicant's major and minor areas. The student must have an approved Plan of Work on file with the Graduate School and must have had at least one thesis committee meeting before taking the Qualifying Examination. Successful completion of the examination is one of the requirements for attaining Ph.D. candidacy.

The Qualifying Examination Committee, which, in most cases, is the dissertation committee, is composed of four (or five) faculty members that includes the advisor, one member from the TNP Steering committee, one (or two) member(s) with expertise relevant to the dissertation and one member with outside expertise.

The Qualifying Examination consists of a written AND an oral examination.

#### **Written Qualifying Examination**

The written component requirement of the Qualifying Examination for Ph.D. TNP students is the NIH F30/F31 predoctoral fellowship application document. For M.D./Ph.D. TNP students, the written requirement is satisfied by taking the USMLE Step I examination prior to entering the Ph.D. program.

Successful completion of the written Qualifying Examination is a degree requirement. If the student does not successfully complete the written Qualifying Examination at the first administration, the examining committee may recommend that the student repeat the examination.

The second examination may not be held until at least four months have passed but must be held within one calendar year following the first examination. The same examining committee must preside over both examinations. The second written examination will be considered final. The dissertation prospectus proposal cannot be used to satisfy the written qualifying examination requirement. Coursework cannot be counted towards the written exam.

### **Oral Examination Requirement**

An oral examination is required of all Ph.D. students, which includes the presentation of the prospectus (dissertation research project). That is, the student presents orally the dissertation research project and answers questions posed by the student's examination committee.

If the student does not successfully complete the oral examination at its first administration, the examining committee may recommend that the student repeat the examination. The second examination may not be held until at least four months have passed but must be held within one calendar year following the first examination. The same examining committee must preside over both examinations. The second oral examination will be considered final.

### **Candidacy Requirements**

Attainment of degree candidacy is a major milestone in the Ph.D. process. The requirements for advancement from Ph.D. applicant to degree candidate are as follows:

- Approval of the Plan of Work by the Graduate School
- Completion of at least 50 credit hours of didactic coursework required on the Plan of Work
- Satisfactory completion of the Qualifying Exam(s)\*
- Establishment of the dissertation advisory committee — its membership may change until the time the prospectus is submitted.

*\*If the Oral Examination is part of the final Qualifying Examination it must be completed within 60 days of the written exam.*

*\*The dissertation prospectus cannot be used to satisfy the written Qualifying Examination requirement.*

The Recommendation for Ph.D. Candidacy Status form is submitted to the Graduate School, and when completion of all requirements has been verified, the Graduate School will advance the applicant to Ph.D. candidacy.

### **Checklist for NRSA Predoctoral (F30/F31) Fellowship Applications**

See supplement attachment.

### **Annual Student Reviews and Individual Development Plan**

Students are required to complete an annual student evaluation form and Individual Development Plan (IDP) to be submitted by July 1 (at the end of academic year 1) with a copy of an updated CV or biosketch. Students that have not yet submitted an NIH fellowship application should format their biosketch according to NIH fellowship application guidance including students who are not eligible to submit an NIH fellowship application (i.e. non-US citizens). Progress will be assessed by the TNP steering committee.

### **Seminar series**

Students are required to attend the TNP seminar series. Each student will have the opportunity to present a seminar on a topic related to their research topics, at least once per year.

### **Travel Award**

Upon matriculation in the TNP, all TNP students are given a Dr. Robert J. Bernucci Travel Award of \$2000 that can be used at any time during the training to attend and present an abstract as first author at national or international scientific meetings. These funds cannot be used for research-related expenses or as a stipend supplement.

## TNP Program: Student Alumni

- 2013 - June**                    **Eric Brown, M.D./Ph.D.**  
BS in Electrical Engineering – University of Michigan  
“Multi-modality assessment of language function”  
Advisor: Eishi Asano, MD – Pediatrics and Neurology
- 2015 – February**            **Brianne Mohl, Ph.D.**  
BS in Natural Sciences – Colorado State University  
“Neural alterations influencing skilled reading in ADHD: a task-based fMRI study”  
Advisor: Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2015 – June**                    **Dhruman Goradia, Ph.D.**  
BE in Instrumentation Engineering – University of Mumbai, India  
“Evidence of distinctive structural alterations that differentiate ADHD boys with and without a comorbid reading disability”  
Advisor: Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2016 - March**                **Hilary Marusak, Ph.D.**  
BA in Biology and Psychology – Kalamazoo College  
“Childhood trauma and emotion processing neurocircuitry”  
Advisor: Moriah Thomason, Ph.D. – Pediatrics
- 2016 - March**                **Denise Briggs, Ph.D.**  
BS in Psychology and Neuroscience – University of Michigan  
“Cognitive, psychiatric, and neuropathological manifestations of repetitive mild traumatic brain injury”  
Advisor: Donald Kuhn, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2016 - June**                    **Helen Wu, M.D./Ph.D.**  
BS in Biomedical Engineering – University of Michigan  
“Identification of metabolite biomarkers in epilepsy using <sup>1</sup>H MRS”  
Advisors: Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences; Jeffrey Loeb, Ph.D. - Neurology
- 2017 - May**                    **Muzamil Arshad, M.D./Ph.D.**  
BS in Physics – Benedictine University  
“Change in processing speed and its associations with cerebral white matter microstructure”  
Advisors: Naftali Raz, Ph.D. – Psychology; Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences

- 2017 - May**                    **Erik Woodcock, Ph.D.**  
 BS in Psychology – University of Washington (Seattle)  
 “Neuropharmacological investigation of stress and nicotine self-administration among current cigarette smokers”  
 Advisor: Mark Greenwald, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2018 - March**                **Michael Lisieski, M.D./Ph.D.**  
 BS in Pharmacology and Toxicology; BA in Psychology – University of Buffalo  
 “The effects of cocaine exposure on hyperactivity, susceptibility to traumatic stress, and locus coeruleus function in rats”  
 Advisor: Shane Perrine, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2018 - March**                **Andrew Neff, Ph.D.**  
 BA in Political Science – Michigan State University  
 “Nutrition, the gut microbiome, and psychology: a novel method to evaluate the gut microbiome from stool, and the impact of resistant starch on the gut microbiome, metabolism, and psychology”  
 Advisor: Paul Burghardt, Ph.D. – Nutrition and Food Science
- 2019 - May**                    **Natalie Wiseman, M.D./Ph.D.**  
 BS in Biology – Bowling Green State University  
 “Assessing metabolic differences following mild traumatic brain injury and their predictive value for patients' outcomes”  
 Advisors: Zhifeng Kou, Ph.D. – Radiology & Biomedical Engineering; Alana Conti, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2020 - July**                    **Chaitali Anand, Ph.D.**  
 BS in Microbiology - University of Pune, Maharashtra, India  
 “Age differences in hippocampal glutamate modulation during associative learning and memory: A proton functional magnetic resonance spectroscopy (<sup>1</sup>H fMRS) study”  
 Advisors: Naftali Raz, Ph.D. – Psychology; Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2020 - October**                **Wafaa Sweidan, Ph.D.**  
 BS in Biology – Lebanese American University, Lebanon  
 “Investigating Gray and White Matter Microstructure in Parkinson Disease Patients using Diffusion Magnetic Resonance Imaging”  
 Advisors: Edwin George, M.D., Ph.D. – Neurology; Jeffrey Stanley, Ph.D. – Psychiatry and Behavioral Neurosciences
- 2021 - February**                **Brian Silverstein, Ph.D.**  
 BA in Philosophy - University of Toronto, Canada  
 “Dynamic Tractography”  
 Advisor: Eishi Asano, Ph.D. – Pediatrics

# TNP Program: Organization and Committees

## Program Director

Jeffrey Stanley, Ph.D.  
Professor of Psychiatry and Behavioral Neurosciences  
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## Program Officer

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Associate Professor of Psychiatry and Behavioral Neurosciences  
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## Steering Committee

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## Student Recruitment Committee

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**Student Representative: 2020 - 2021**

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# TNP Program Forms