

Training Program in Population Neuroscience of Aging & Alzheimer's Disease (PNA)

The Graduate School of Public Health and the Department of Psychiatry at the University of Pittsburgh are pleased to announce a **new pre- and postdoctoral training program in Population Neuroscience of Aging & Alzheimer's Disease**. The program is codirected by Drs. C. Rosano and M. Ganguli, with positions available immediately. Please contact stc15@pitt.edu.

The PNA program trains highly talented individuals to pursue successful independent research in the etiology of Alzheimer's Disease and other age-related dementia (ADRD). Eligible applicants must have backgrounds in either contemporary neuroscience or population/data science. For example: PhD graduates or candidates in Epidemiology, Neuroscience, Information Science, Biostatistics, Biomedical informatics and MD/DO graduates with training in Neurology, Psychiatry, Geriatric medicine, and related disciplines. Please contact stc15@pitt.edu with questions.

Background: The field of brain aging is undergoing a profound transformation because of the collision of two phenomena: worldwide increase of the aging population, and rapid technological advancements in health measurements in general and in brain science in particular. Our successes in extending lifespan, combined with only marginal improvements in healthspan, increase the number of very old adults, but they also increase the burden of chronic conditions; these conditions can affect the central nervous system either directly (e.g. stroke) or indirectly (heart conditions, diabetes). It is expected that the cumulative exposure to such chronic conditions, chronological aging, and possibly to other life-long novel environmental and genetic factors, will interact with each other in very complex ways to produce heterogeneous neurocognitive phenotypes and ultimately drive increased risks of dementia. Understanding these complex pathways is fundamentally important to conduct successful rigorous etiological research into causes and determinants of ADRD. We are also living through a time of great technological advances in methods to measure brain abnormalities, the application of which is providing ever more precise phenotypes but also very large and complex datasets. Such data require careful sampling designs and analytical approaches infused with an understanding of the condition being studied to effectively produce new knowledge to move research to treatment and prevention.

Our vision: Successful clinical neuroepidemiological investigators of the future must be able to link comorbidities, environmental exposures, lifestyles, genomics, e.g. host susceptibility, with knowledge of modern technology of neurosciences and measurement of brain disease and data science.

Our approach: Our curriculum responds to the changing career landscape, by providing: a) foundational knowledge in data science; b) availability of multi-center and international CNS databases; c) enhanced training in cutting-edge multimodal methodologies to measure brain changes with age, including neuroimaging and post-mortem assessments; d) hands-on experiences with internet-based designs for recruitment and data collection. Training in the responsible conduct of research and efforts to increase diversity are important objectives of the program.

Coursework: Coursework is tailored to each individual's background and research objectives. PNA trainees must demonstrate a strong commitment to expand their knowledge of population neuroscience of aging. Required coursework includes: Population neuroscience (fall, 1CR); Neuroepidemiology (spring, 2CR); Multimodal neuroimaging (summer, 2 CR); Biology of aging (summer, 1 CR); Neurobiology of aging (fall, 2CR). Additional coursework in neuroscience, epidemiology, and data science will be customized to match the students' background and research interests. The deliverable of the coursework is to prepare a first draft of a new grant proposal to facilitate transition to independent research; with the oversight of the mentoring committee, trainees will use each course as a building block to prepare their original grant proposal.

Research Practicum: The objective of the Practicum is to apply concepts taught in classes to conduct original neuroepidemiological research that will lead to published research and a submitted grant application. The research practicum focuses on a "thematic area" identified by the trainee together with the mentoring committee, and it is articulated in three (3) rotations: Data collection, Data Analysis, and research clinical rotation. Trainees use the rotations to develop experience with collaborative research and networking skills. Each rotation is overseen by a member of the mentoring team with expertise in that specific field. The deliverables of the practicum are: a) learn practical aspects of conducting research, including how to work within a multidisciplinary team; b) completion of at least one manuscript and related presentation through independent data analysis; and c) preparation of a new grant research proposal.

