#SundayWiMIN25 Week 5: Dr Margaret (Maggie) Flanagan

Dr Margaret (Maggie) Flanagan is a physician-scientist and neuropathologist, dedicated to improving how we understand and diagnose dementia and neurodegenerative diseases, which cause memory loss and other brain-related problems.

She is a tenured associate professor of pathology and laboratory medicine and holds the inaugural Endowed Baptist Health Foundation of San Antonio's Distinguished Chair in Alzheimer and Neurodegenerative Diseases at the University of Texas Health Science Center, San Antonio.

She holds dual citizenship in Ireland and the United States, with ties to both countries. She was born in the U.S. but spent part of her early childhood in Sligo, Ireland, before her family returned to the United States. Her father, Thomas Flanagan, was born in Corcoscony, County Leitrim, Ireland, in 1935 and immigrated to the U.S. at the age of 19. He served in the U.S. Army during the Korean War and later became a well-known figure in the Irish community in Chicago, where he was a master barman and a strong supporter of Irish music and culture. Throughout his life, he helped many newly arrived Irish immigrants adjust to life in the U.S. His love for Ireland and commitment to preserving its traditions had a lasting impact on his family. Today, Dr Flanagan honors his legacy as the owner of his primary school, a traditional thatched-roof schoolhouse in Dromahair, Leitrim, which he left to her. Dr Flanagan also shares her father's passion for classic cars and owns his 1953 right-hand drive Ford Anglia, which he brought over from Ireland.

Dr Flanagan first trained as a cytotechnologist, a specialist who analyzes cells for signs of disease, earning a Bachelor of Science degree from the University of North Dakota. She then returned to Ireland to attend Trinity College Dublin, where she graduated with her medical degree in 2013. While at Trinity, she was inspired by Dr Orla Sheils, now Vice Provost of the university, who sparked her interest in pathology and research. Under Dr Sheils' mentorship, Dr Flanagan contributed to a project investigating BRAF V600E mutations in different subtypes of papillary thyroid carcinoma. This research was part of a larger study on the MEK/ERK pathway, which plays a key role in cancer development and drug resistance.

While studying medicine at Trinity, Dr Flanagan also assisted in cervical smear screening for CERVIVA, a program focused on improving cervical cancer detection. However, her decision to specialize in neuropathology was shaped by two major experiences. First, during a gerontology rotation at Tallaght University Hospital, she worked with Dr Desmond O'Neill, a leading expert in aging and dementia care. His approach to treating older adults with memory loss inspired her to explore the science behind brain diseases. Around the same time, her father was diagnosed with Alzheimer's disease, a deeply personal moment that changed her perspective on medicine. She was shocked to learn that there were no effective treatments for Alzheimer's disease and felt a strong drive to find answers through research.

After medical school, Dr Flanagan trained as a pathologist and completed her residency at the University of Washington in Seattle, where she developed a cost-efficient brain autopsy protocol and gained valuable experience in brain disease research. She then completed a neuropathology fellowship and postdoctoral training at Stanford University in California, where she focused on mastering quantitative neuropathologic techniques, biospecimen banking, and digital pathology applications. Her work at Stanford focused on developing and applying quantitative techniques to better study Alzheimer's and Parkinson's disease, helping to develop new ways to analyze human brain tissue samples at the molecular level.

In 2021, Dr Flanagan became the Principal Investigator of the Nun Study, a groundbreaking research project on aging and Alzheimer's disease. This study, originally launched in 1990, followed 678 School Sisters of Notre Dame, Catholic nuns who agreed to donate their brains for research after their passing. Although all of the original participants have passed, their contributions continue to provide invaluable data on cognitive resilience and brain aging. Dr Flanagan successfully relocated the study's brain autopsy collection and extensive research materials from Chicago to San Antonio, ensuring the continued impact of this vital work. Under her leadership, the Nun Study remains active, incorporating neuropathological analyses, spatial transcriptomic data, cognitive assessments, and AI-driven digital pathology approaches to uncover new insights into Alzheimer's disease and related dementias.

Beyond the Nun Study, Dr Flanagan is leading efforts to improve biomarker testing, digital pathology, and AI-driven diagnostics for Alzheimer's disease. She serves as Neuropathology Core Leader for the South Texas Alzheimer's Disease Research Center, directs the Biggs Institute Brain Bank (one of the largest brain banks in the United States) and was recently elected to serve on the national three-member Neuropathology Core steering committee for Alzheimer's Disease Research Centers in the United States. She also serves as Medical Director of the high-complexity CLIA-certified laboratory at the Biggs Institute, where she has introduced and validated new FDA approved spinal fluid and blood-based biomarker tests to improve early diagnosis and treatment options for Alzheimer's patients across Texas and beyond.

Dr Flanagan's work continues to shape the future of neuropathology, brain banking, and dementia research. From her time at Trinity College Dublin to leading one of the most historically significant Alzheimer's research studies in the United States, her journey reflects the global impact of Irish contributions to medicine. Through her groundbreaking research, she honors the legacy of the School Sisters of Notre Dame, advances the field of dementia science, and carries forward the resilience, generosity, and Irish heritage that her father embodied.