Professor Rowe was appointed to the Faculty of Medicine, Human and Health Sciences at Macquarie University in 2007 at the age of 42, the youngest Professor of Neurology in Australia. He was instrumental to the nascent health precinct at Macquarie University, MQ Health. The Neurology Clinic at Macquarie was the first clinic to open in June 2010. Rowe has delivered neurological care to thousands of patients with Motor Neuron Disease, Parkinson's disease and other neurological conditions. The Neurology service at Macquarie currently cares for >200 patients with MND and >800 patients with Parkinson's disease.

In 2013, Rowe was the catalyst for the Motor Neuron Disease Research Centre at Macquarie University, recruiting six research teams to work on MND including genetics, proteomics, cellular signalling, animal modelling, novel therapies and clinical trials. Now with 82 staff and a budget of AUD13 million per annum, the MND Research Centre at MQ is the largest MND research centre and clinic in Australia. Rowe founded the Neurodegenerative Diseases Biobank at MQ, that currently curates >80,000 biospecimens from >500 patients with both genetic and sporadic MND in addition to other neurodegenerative diseases.

Professor Rowe (orcid: 0000-0003-0912-2146) has >100 manuscripts in peer-reviewed journals, chapters in textbooks on Motor Neurone Disease, and has edited a textbook on the Non Motor Manifestations of Parkinson's Disease (Oxford University Press). He has >6300 total citations with >3300 citations over the last five years. His publications in the area of MND appeared in Nature Genetics (2016, doi: 10.1038/ng.3622., 334 citations, Altmetric score 346 (top 1%), Nature Communications (2017, doi: 10.1038/ncomms14774), 87 citations, Altmetric score 243 (top 2%) and Science Translational Medicine (2018, doi: 10.1126/scitranslmed.aah4066), 197 citations, Altmetric score 537 (top 1%). Rowe holds two patents in the area of Parkinson's disease. In addition a patent concerning a blood test in Motor Neuron Disease and other Neurodegenerative diseases was awarded in 2018.
Professor Rowe runs the Clinical Trials Unit relevant to MND at MQ, initiating the first human clinical trials at Macquarie University in 2012 (The Parkinson's Progression Marker Initiative). Rowe is the Principal investigator of nine therapeutic trials in MND and PD from Phase 1 to Phase 3 trials exploring novel therapeutics in MND and Parkinson's disease. He manages a research and clinical trial staff of six. Rowe is the Principal Investigator on the ATLAS study in pre-symptomatic MND patients, with Macquarie University the only site in Australia. This landmark study utilizes antisense oligonucleotide therapy (tofersen) directed at SOD1, one of the causes of genetic MND. Macquarie is one of the global lead recruitment sites for delivering intrathecal therapy for genetic causes of MND in the ATLAS trial. In addition Rowe manages the care of patients with SOD1 MND on the expanded access program for Biogen. This program delivers ASO therapy intrathecally to symptomatic patients with MND due to a mutation in MND. Professor Rowe was also the Principal investigator on the WAVE study for genomic therapy for c9orf72 related MND.