Thursday 10 May 2018 – at 11.30 am
Seminar Room “-1” – Department of Mathematics

Roxana O. Carare
(University of Southampton, UK)

Intramural Periarterial Drainage Pathways and the pathogenesis of neurological diseases

Abstract:
Accumulation of the β-amyloid (Aβ) protein in cerebral blood vessels is a hallmark of Alzheimer’s disease. Soluble Aβ from the extracellular spaces of the brain is removed along the basement membranes of capillaries and basement membranes surrounding smooth muscle cells of arteries towards the surface of the brain, as intramural periarterial drainage (IPAD). This process depends on the biochemical integrity of the extracellular matrix and the strength of arterial smooth muscle cells. With ageing, possession of Apolipoprotein E4 (APOE4) genotype, hyperlipidemia, maternal high fat, immune complexes, IPAD fails, resulting in the accumulation of proteins in the walls of cerebral arteries as cerebral amyloid angiopathy. Head injury results in changes in the extracellular matrix and accumulation of perivascular tau, possibly as a result of a failure of IPAD. Within 5 minutes of intracisternal injection, convective influx/glymphatic entry of Aβ from the cerebrospinal fluid into the cerebral parenchyma is along the glial-pial basement membranes and enters IPAD by 30 minutes. Clusterin (Apolipoprotein J) appears to be a chaperone for Aβ, facilitating IPAD and efficient innervation of cerebral arteries is key to maintaining optimal IPAD.

Contacts: Professor E. F. Toro and Professor A. Valli.