

# **Neuroprotection and neurorepair in brain and spinal cord injury**

*A link between neurotrauma and neurodegeneration*

**Professor Adina T. MICHAEL-TITUS**

Centre for Neuroscience and Trauma

Blizard Institute

Barts and The London School of Medicine and Dentistry

Queen Mary University of London

Traumatic injury in the central nervous system triggers a cascade of pathophysiological processes and is for many individuals a life-changing event. Spinal cord injury and brain injury can lead to significant disability, and no neuroprotective or neuroregenerative treatment is currently available, in spite of more than two decades of effort. There is ample evidence across a range of experimental models of traumatic injury of the brain and spinal cord, that there are several compounds that could limit the secondary injury, but translation to the clinic has failed. We will explore potential causes of this failure and will discuss the specific case of omega-3 fatty acids, which have been shown in several models of central nervous system injury to have therapeutic and prophylactic potential. The talk will review the accumulating evidence that supports the therapeutic potential of long-chain omega-3 fatty acids in central nervous system trauma and will highlight some of the remaining questions that need to be answered in order to improve the chances of success in translation. The link between neurotrauma and neurodegeneration will also be discussed, and placed in the perspective of new concepts in the diagnosis and management of neurodegenerative conditions.