

## Eleuterio F. Toro

*University of Trento, Italy*

### Neurological diseases and interacting fluid compartments of the central nervous system: holistic mathematical modeling

Fluid compartments that are relevant to the understanding of the physiology of the central nervous system (CNS) are first reviewed, emphasising very recent findings that include the discovery of a meningeal lymphatic system. There follows a brief review of some neurological diseases thought to be associated to malfunctions of CNS fluid compartment, such as Multiple Sclerosis, Meniere's Disease, and Idiopathic Intracranial Hypertension.

I then describe a global, closed loop mathematical model for the entire human circulation coupled to the dynamics of cerebrospinal fluid (CSF) and brain dynamics. Sample computations on the effect of extracranial venous strictures on CNS haemodynamics and CSF dynamics are presented. Intracranial venous hypertension and disturbed CSF dynamics are predicted. These computational results support recent medical hypotheses and may help to unravel some of the underlying mechanisms of some of these diseases.

|               |                                       |
|---------------|---------------------------------------|
| <b>Data</b>   | Xoves, 16 de novembro de 2017         |
| <b>Lugar</b>  | Aula Magna - Facultade de Matemáticas |
| <b>Hora</b>   | 11:00                                 |
| <b>Idioma</b> | Castelán                              |