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Mathematical and Computational Modeling of Physiological Disorders: A Case Study of the IUPS Human Physiome Project and Aneurysmal Models

Abstract:

The International Union of Physiological Sciences (IUPS) has undertaken a project called the Physiome Project with the goal of developing a comprehensive framework for modeling the human body using computational techniques which incorporate the biochemistry, biophysics and anatomy of cells, tissues and organs. The project aims to establish a web-accessible physiological databases dealing with modelrelated data which includes bibliographic information, at the cell, tissue, organ and organ system levels. The databases are intended to provide a quantitative description of physiological dynamics and functional behavior of the intact organism. The long-range objective is to understand and describe the human organism, its physiology and to use this understanding to improve human health.

In this survey, we will give an overview of the Physiome Project and an analysis of the collection of mathematical and computational models aimed at detection, prevention and treatment of physiological disorders such as aneurysms. In conclusion, we will show the connection between the aneurysm database and the Physiome Project.