1.

Record Nr.	UNINA9910346750103321
Autore	Vanessa Diaz-Zuccarini
Titolo	Mathematics for Healthcare
Pubbl/distr/stampa	Frontiers Media SA, 2018
Descrizione fisica	1 online resource (284 p.)
Collana	Frontiers Research Topics
Soggetti	Physiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Sommario/riassunto

In 1996, and with extraordinary prescience, Panfilov and Holden had highlighted in their seminal book 'Computational Biology of the Heart' that biology was, potentially, the most mathematical of all sciences. Fast-forward 20 years and we have seen an exploition of applications of mathematics in not only biology, but healthcare that has already produced significant breakthroughs not imaginable more than 20 years ago. Great strides have been made in explaining through quantitative methods the underlying mechanisms of human disease, not without considerable ingenuity and effort. Biological mechanisms are bewildering: complex, ever evolving, multi-scale, variable, difficult to fully access and understand. This poses immense challenges to the computational physiology community that, nevertheless, has developed an impressive arsenal of tools and methods in a vertiginous race to combat disease with the tall order of improving human healthcare. Mechanistic models are now contending with the advent of machine learning in healthcare and the hope is that both approaches will be used synergistically since the complexity of human patophysiology and the difficulty of acquiring human datasets will require both, deductive and inductive methods. This Research Topic presents work that is currently at the frontier in computational physiology with a striking range of applications, from diabetes to graft failure and using a multitude of mathematical tools. This collection of articles represents a snapshot in a field that is moving a dizzying speed, bringing

understanding of fundamental mechanism and solutions to healthcare problems experienced by healthcare systems all over the world.