



biology



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Network Analysis for Biology and Precision Medicine

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Message from the Guest Editors

Until recently, the investigation of disease etiology, diagnosis, and treatment was based on a conventional reductionist approach. This tenet argues that critical biological factors work in a simple linear mechanism to control disease pathobiology. Rather, they are nearly always the result of multiple pathobiological pathways that interact through an interconnected network: a disease is rarely a direct consequence of an abnormality in a single gene or molecular component. A large body of evidence that is now emerging from new genomic technologies points out directly to the cause of disease as “perturbations” of biological networks. There is an urgent need for integrated network-based algorithms and machine learning methods to reconcile biological network representation and large-scale data integration.

Deadline for manuscript
submissions:

closed (10 May 2023)



mdpi.com/si/103335

Special Issue



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