

Special Issue

Mathematical Modelling and Control Strategies for System Biotechnology

Message from the Guest Editors

Achieving the maximum production in a bioprocess is not trivial since microorganisms are related to non-linear growth dynamics, inhibitory phenomena, and an unpredictable metabolism that diverts the microorganism from the desired production. Advanced mathematical tools are necessary for the field of systems biotechnology to (i) properly understand and characterize the behavior of microorganisms and the production of metabolites via robust kinetic models in different culture conditions and bioreactors, (ii) optimize the bioprocess maximum yield and productivity by using process intensification and extreme seeking control, (iii) improve virtual instrumentation via observers and estimators of variables that cannot be measured online, (iv) opportunistically detect faults in the sensors that decrease productivity or compromise operator safety, (v) and design advanced control strategies to guarantee the maximum bioproduction during the bioprocess. The purpose of this Special Issue is to report the recent advances in modeling, control, optimization, sensor fault detection, and observer design in the field of system biotechnology.

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The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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