

## Special Issue

# Artificial Intelligence and Machine Learning Empower Synthetic and Systems Biology: Theory, Design, Optimization and Application

### Message from the Guest Editors

Artificial Intelligence (AI) and Machine Learning (ML) are rapidly transforming synthetic biology and systems biology, accelerating both research and innovation across basic and applied science. From enhancing the design and optimization of genetic circuits to improving protein structure prediction and enabling the analysis of complex, unwieldy datasets, these computational approaches are reshaping how scientists explore and engineer living systems. Their growing role in boosting the accuracy of gene-editing workflows and supporting the creation of custom organisms for medicine, agriculture.

We invite submissions that highlight innovative AI and ML-enabled approaches in bioengineering, modeling, design automation, and the study of complex systems. Contributions may include original research, perspectives, or reviews that demonstrate how these tools deepen biological insight, automate sophisticated tasks, or open new avenues for exploration. This Special Issue is also open to critical discussions about current approaches as well as to more theoretical contributions on the intersection between AI, ML, and synthetic and systems biology.

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### Guest Editors

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### Deadline for manuscript submissions

30 August 2026



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