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Machine learning for metabolic engineering: A review

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Abstract

Machine learning provides researchers a unique opportunity to make metabolic engineering more predictable. In this review, we offer an introduction to this discipline in terms that are relatable to metabolic engineers, as well as providing in-depth illustrative examples leveraging omics data and improving production. We also include practical advice for the practitioner in terms of data management, algorithm libraries, computational resources, and important non-technical issues. A variety of applications ranging from pathway construction and optimization, to genetic editing optimization, cell factory testing, and production scale-up are discussed. Moreover, the promising relationship between machine learning and mechanistic models is thoroughly reviewed. Finally, the future perspectives and most promising directions for this combination of disciplines are examined.

Keywords: machine learning, omics data, pathway design, pathway optimization, cell factories, production scale

Full text

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