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(54) Title: PREDICTING CELL CULTURE PERFORMANCE IN BIOREACTORS

(57) Abstract: A computational method of modeling a bioreactor combines mechanistic models of kinetics of metabolic fluxes and flux balance analysis to predict cell culture performance. The mechanistic models include effects of process variables descriptive of extracellular environment, e.g., temperature, acidity, osmolarity, and/or metabolite concentrations. The method constrains flux rates based on the mechanistic models and computes the flux rates in view of suitable metabolic objectives. The method simulates time evolution of process variables of the bioreactor based on user input and computes performance metrics to display to the user, to control a bioreactor, and/or to train an artificial intelligence model of a bioreactor.



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