

Quantitative feature extraction from the Chinese hamster ovary bioprocess bibliome using a novel meta-analysis workflow - DTU Orbit (09/11/2017)

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The scientific literature concerning Chinese hamster ovary (CHO) cells grows annually due to the importance of CHO cells in industrial bioprocessing of therapeutics. In an effort to start to catalogue the breadth of CHO phenotypes, or phenome, we present the CHO bibliome. This bibliographic compilation covers all published CHO cell studies from 1995 to 2015, and each study is classified by the types of phenotypic and bioprocess data contained therein. Using data from selected studies, we also present a quantitative meta-analysis of bioprocess characteristics across diverse culture conditions, yielding novel insights and addressing the validity of long held assumptions. Specifically, we show that bioprocess titers can be predicted using indicator variables derived from viable cell density, viability, and culture duration. We further identified a positive correlation between the cumulative viable cell density (VCD) and final titer, irrespective of cell line, media, and other bioprocess parameters. In addition, growth rate was negatively correlated with performance attributes, such as VCD and titer. In summary, despite assumptions that technical diversity among studies and opaque publication practices can limit research re-use in this field, we show that the statistical analysis of diverse legacy bioprocess data can provide insight into bioprocessing capabilities of CHO cell lines used in industry. The CHO bibliome can be accessed at <http://lewislab.ucsd.edu/cho-bibliome/>.

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