NEW TECHNIQUES FOR THE PRODUCTION OF HIGH-PERFORMING INDUSTRIAL ENZYMES

Michael Liszka, BASF Enzymes LLC, USA
Michael.liszka@basf.com
Adrienne Davenport, BASF Enzymes LLC, USA

Key Words: Industrial Enzymes, Enzyme Engineering, Sequence Diversity, Machine Learning

For over 35 years, BASF has produced biobased products for food, health, pharmaceutical, crop protection and chemical industries by fermentation and biocatalysis. Industrial enzymes, in particular, have the potential to drive sustainable solutions by increasing efficiency across food and traditional industries and to aide in reducing carbon dioxide emissions. BASF possesses the end-to-end core technologies for product development spanning the discovery of novel enzymes, protein engineering and high-throughput screening, and strain and process development. We continue to build and maintain intimate application knowledge in our strategic markets to deliver relevant products to our customers.

Our presentation highlights several case studies where BASF colleagues have applied these techniques to optimize enzyme properties including thermal tolerance, substrate specificity, and expression. We'll demonstrate the discovery and development of new industrial enzymes using iterative and computer-aided design techniques, including how data driven design cycles can improve an enzyme's biophysical properties and application performance. We'll also illustrate how machine learning is starting to be applied towards developing new amino acid sequences to drive improvements in industrial enzyme production.

Figure 1 – Core Technologies for Industrial
Enzyme Development