



Protein Engineering Beyond Nature's Limit

Are you grappling with challenges related to protein stability, activity, expression, or purification? Look no further - the Austrian Centre of Industrial Biotechnology (acib) offers new machine learning and neural network tools to predict better protein variants with unprecedented accuracy.

BACKGROUND

Proteins play a pivotal role across various industries, from food/feed to biocatalysts and life-saving therapeutics. However, the transition from natural functions to industrial applications often presents formidable obstacles. Nature has evolved proteins for its own purposes, which can lead to problems if they are used for commercial applications: Enzymes do not recognize the target substrate or produce undesired side-products; solvents inactivate them, or they precipitate because of unfavorable process conditions. Some biotherapeutics are recognized as foreign molecules by the immune system, while others have low affinity, and some are so small that they are too rapidly cleared from the bloodstream before exerting an effect. Expression and purification challenges further exacerbate these complexities, hindering or destroying any hopes of commercialization. Traditional approaches may offer no cost-efficient solution since they rely on laborious experimentation, and limited data sets.

TECHNOLOGY

Dr. Oberdorfer's expertise leverages advanced techniques such as *in silico* deep mutational scanning coupled with cutting edge *de novo* and redesign of proteins, surpassing the limitations of conventional sequence-based methods to:

- Predict (changes in) protein function
- Study structural protein representations and interactions with reduced data requirements
- Analyze protein variants *in-silico* via advanced ML tools and classic modelling
- Rapid identification of better variants
- Minimize wet-lab experimentation
- Reduced development time and cost
- Enhance protein performance

This technology can also be used for *de novo* protein design, going beyond the limitations of existing proteins and using the vast unexplored sequence space for protein design. Through careful and proven computational simulations, we can develop completely new protein structures in close collaboration with wet-lab experiments to continuously refine the design. Ideal for challenging projects requiring a novel and patentable solution.

OFFER

This project offer serves as a starting point and under protection of a CDA/NDA we provide you with professional strategies for engineering or *de novo* creation of your chosen protein. Any intellectual property developed in such a project would fully belong to you as the investor or industrial partner. Redefine the possibilities of protein engineering with us and gain a competitive edge over your rivals.

acib-EXPERTS:

Dr. Gustav Oberdorfer

DEVELOPMENT STATUS:

TRL 3 (Experimental Proof of Concept)

KEYWORDS:

Computational Protein Engineering
Protein Function Prediction
Deep Mutational Scanning
De novo Protein Design
Neural Networks
Optimizing amino acid substitutions
Collaboration Opportunity
Generation of Intellectual Property

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