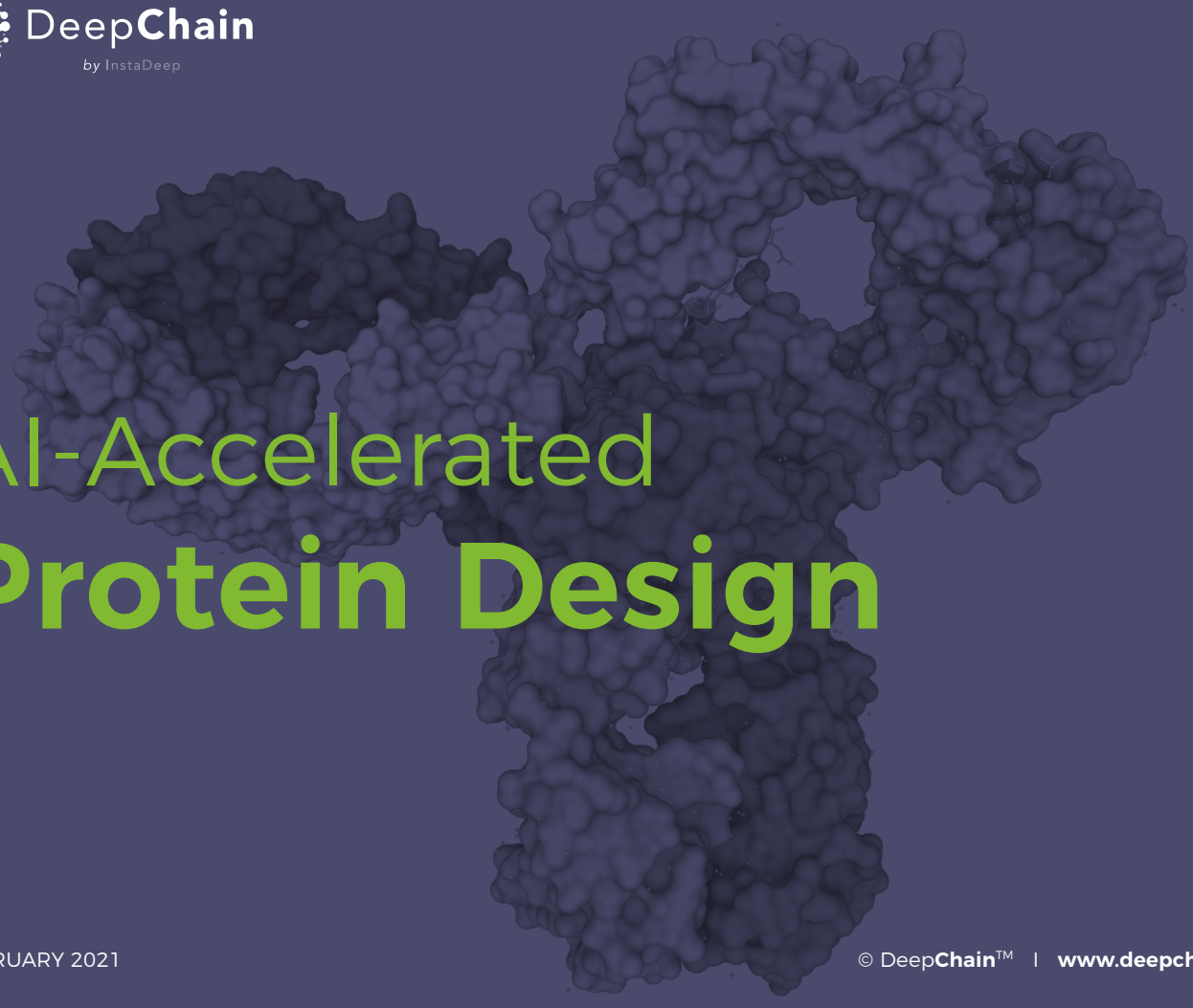
DeepChain
by InstaDeep



AI-Accelerated **Protein Design**

FEBRUARY 2021

Master the potential of proteins

Proteins are molecules that can perform complex and specific reactions and have critical functions that support life.

Scientific drive and technological advancement has led to an increased understanding on the role of proteins in health and disease, and how they can be leveraged as tools for diagnosis, research and industry purposes.

However, the protein landscape is vast and with 200,000,000 unique proteins identified in nature there is still an unlimited potential to be uncovered and discovered.

Powered by InstaDeep, whose mission is to accelerate the transition to an AI-first world that benefits everyone,

DeepChain™ has been launched as an AI-powered protein exploration and design platform to empower protein research.

DeepChain™ offers 3 Modules

Explore with the Playground module

Enter your protein sequences and unleash the power of a transformer language model trained on billions of protein sequences.

- Gain insights on which are the key amino acids linked to function and or protein stability to inform your mutation experiments.
- Predict mutation tolerance and study evolutionary preserved variants.
- Compare wild-type and mutant sequences to obtain further understanding of your protein.

Design with the AI Designer module

Input your protein structures and leverage innovative physics-enabled AI models to predict binding changes on your complexes.

- Analyse your mutations of interest and discover how these affect the binding and stability of your protein complex to study evolution and/or disease associated protein variants.
- Uncover mutations that increase binding between your proteins of interest to optimize target specificity, improve enzyme reactions and immunogenicity, build sensors or facilitate research of big protein complexes.

Validate with the Molecular Dynamics module

Load your protein structures and conduct molecular dynamics simulations to visualise the physical movement of your molecule.

- Observe and analyse your newly resolved protein structures.
- Validate the stability and binding motion of the newly generated sequences derived from the AI Designer module.

Extra features

Analyse your results with ease

MolStar visualisation toolkit and Jupyter Notebook are offered as a service to facilitate personalised analysis of your results.

Scan protein patents databasses

Check that your new sequences are unique and patentable.

Collaborate invite and share

Collaborate live on your projects by inviting people or sharing your workspace link.

Keep it safe with our secure platform

Your results remain private thanks to...so and so technologies.

Breakthrough innovation for protein research

Master the language of biology.
Learns biology and protein design from first principles. No heuristics. Leveraging a transformer model trained using UniRef100 with data on 2.1B proteins to uncover novel protein sequences and discover new protein properties.

Autonomous, no expertise in AI needed.
Intuitive platform with automated scoring and evaluation pipeline.

Fast, scalable AI-powered approach.
Cloud-Native, no computing power required onsite. Can get results in days to questions that can take months to solve experimentally thanks to blazing-fast NVIDIA GPUs.

Innovative and powerful AI engine.
Leveraging decision making AI techniques such as Reinforcement Learning, a type of Machine Learning that improves continuously, developed by best-in-class engineers.

Get the most from your results.
Results are displayed through multiple 3D visualisations tools. Jupyter Notebooks is offered as a service to facilitate further personalised analysis.

All your protein-design needs in one place.
Explore, design and validate protein sequences through a user-friendly interface.

The DeepChain™ Playground

The DeepChain™ Playground is now accessible for free to analyse your protein sequences of interest and to discover variants and key regions. Create your personalised and secure account and start using AI to accelerate and improve your design process and lead to key discoveries by registering here.

If you would like to learn more about DeepChain™, feel free to send us an email at hello@deepchain.bio.

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