

# Master Thesis

## Topic: Machine Learning-Assisted Design of Biopolymer-Based Hybrid Materials

### Project Description

Discovering optimal composition of bio-based compounds and process conditions to achieve specific properties is a complex, multifaceted problem that requires extensive domain knowledge and intuitive insights. It can be effectively addressed by combining experimental design, optimization techniques and machine learning. The project will be carried out in the Cellulose & Wood Materials Laboratory at Empa Dübendorf and is aimed at exploring the material design space more effectively by leveraging advanced machine learning algorithms.

#### Your tasks will include:

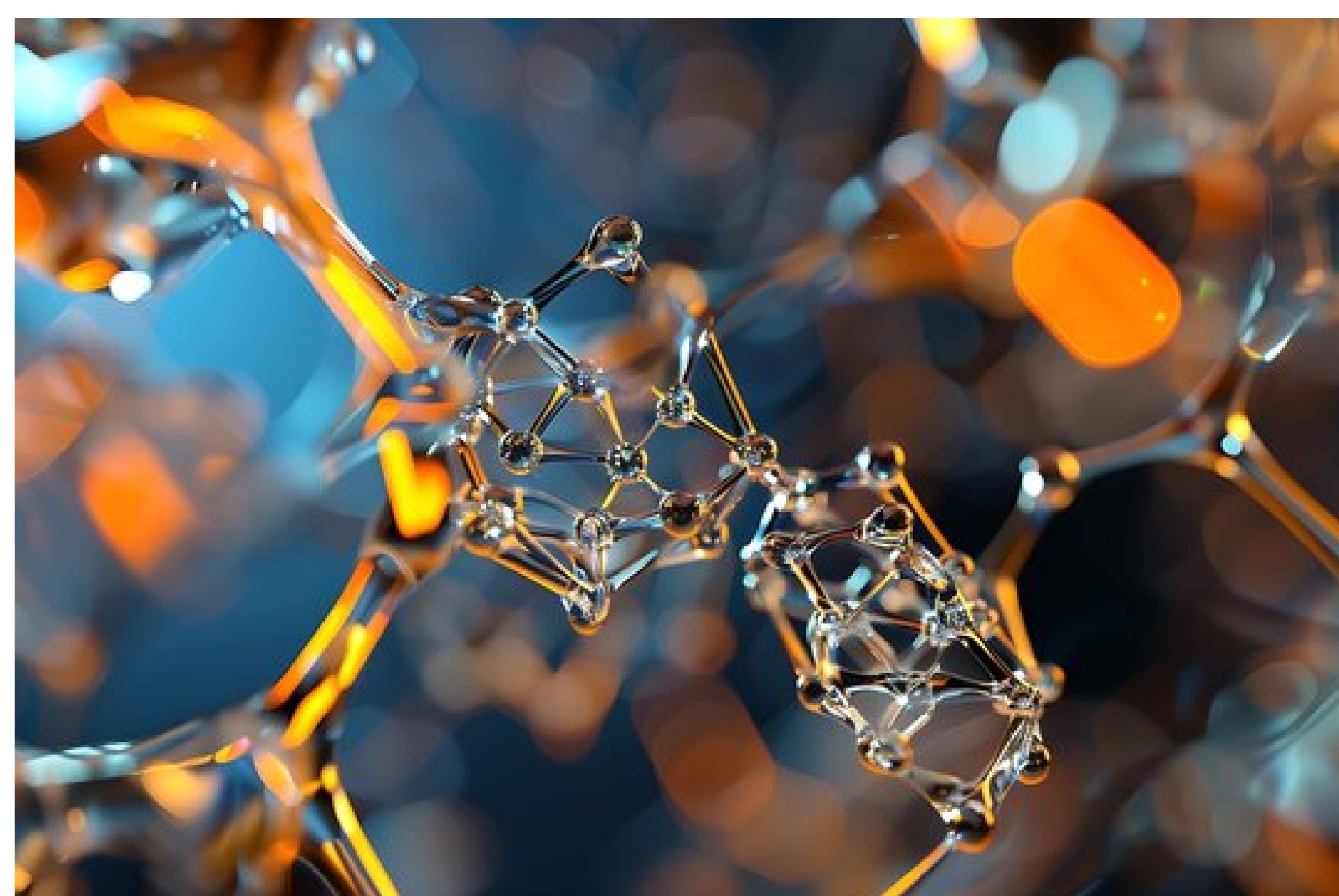
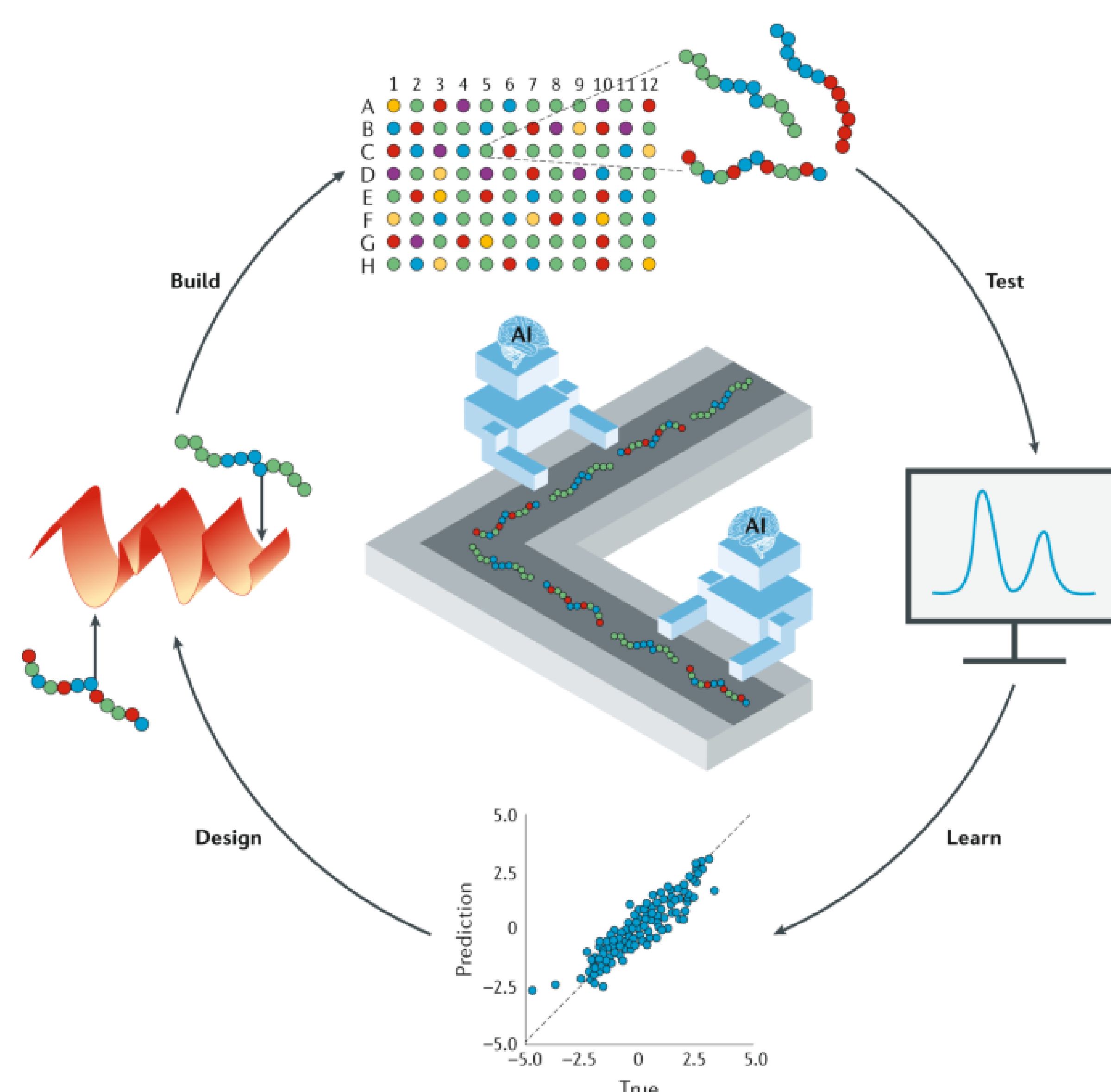
- Conducting experiments to collect data on various biopolymer composite combinations, process conditions, and resulting properties.
- Reviewing literature to gather data from existing papers and monographs on biopolymer properties and their process conditions.

#### What we offer:

- A multidisciplinary research project at the intersection of material science, chemistry and computer science.
- Dynamic, motivating and creative environment .
- An opportunity to acquire and refine the technical skills necessary for your future experiments, whether they involve experimental work or computational modeling.
- A possibility to work in a well equipped lab and learn from competent and knowledgeable researchers.
- Guidance with acquiring knowledge in implementing statistical modeling and ML in the field of material science (if interested).

#### What we expect:

- Education in material science, chemistry, or polymer chemistry.
- Prior lab experience (mandatory).
- Commitment and dedication to the research project through active participation and consistent effort.
- Applying critical thinking to analyze data, troubleshoot experiments, and develop new hypotheses or methods.



#### Contacts:

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