Protein Design Using Machine Learning

Your Name

September 27, 2023

Outline

Introduction to Protein Design

- Role in drug discovery & synthetic biology
- Comparison:
  - Traditional lab approaches
  - Computational methods
  - ML-enhanced techniques
- Challenge: Designing functional proteins with desired properties.

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Data: The Power of MSAs

- What are MSAs?
  - Alignments of related sequences
  - Captures evolutionary information
- Importance:
  - Vast sequence data source
  - Inferring sequence-function relationships
  - Insight into sequence variability

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Shallow Learning in Protein Design

- Brief Overview:
  - Basic statistical and mathematical tools
  - Focus on direct sequence relationships
- Key Techniques:
  - PCA/SVD for data representation
  - Random Markov Field for sequence analysis

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Q/A Session

- Reflect on methodologies discussed
- Share thoughts and experiences
- Seek clarifications and deeper insights

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Further Resources

- Books:
  - "Protein Design by ML" by Dr. A. Scientist
  - "Deep Dive into Protein Structures" by Dr. B. Researcher
- Research papers:
  - "Applications of Deep Learning in Proteomics", Journal X, 2022.
  - "Innovative Techniques in Protein Design", Journal Y, 2023.
- Online courses, webinars, and tutorials

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