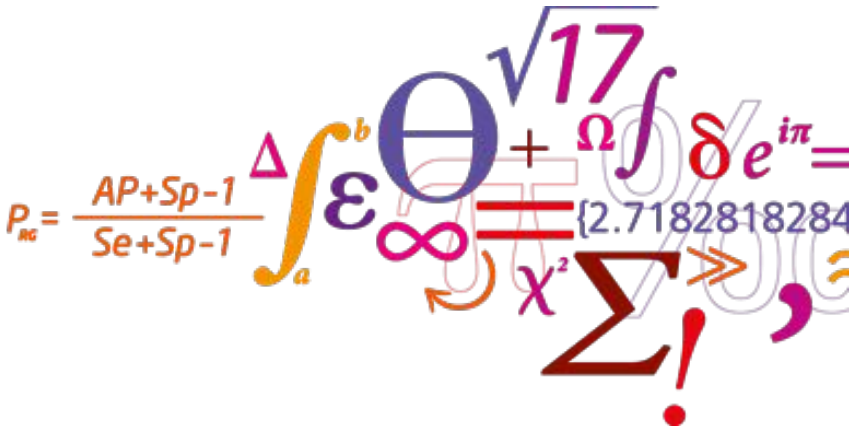
36685 Immunological Bioinformatics

Welcome and Introduction

Leon Eyrich Jessen



Immunoinformatics and Machine Learning
Department of Bio and Health Informatics

First of all...

- Technical issues in migrating from old wiki to new wiki

Course Organisers

Leon Eyrich Jessen
Postdoc

Paolo Marcatili
Associate Prof

Morten Nielsen
Professor

Immunoinformatics and Machine Learning Group at DTU Bioinformatics

What is Immunological Bioinformatics?

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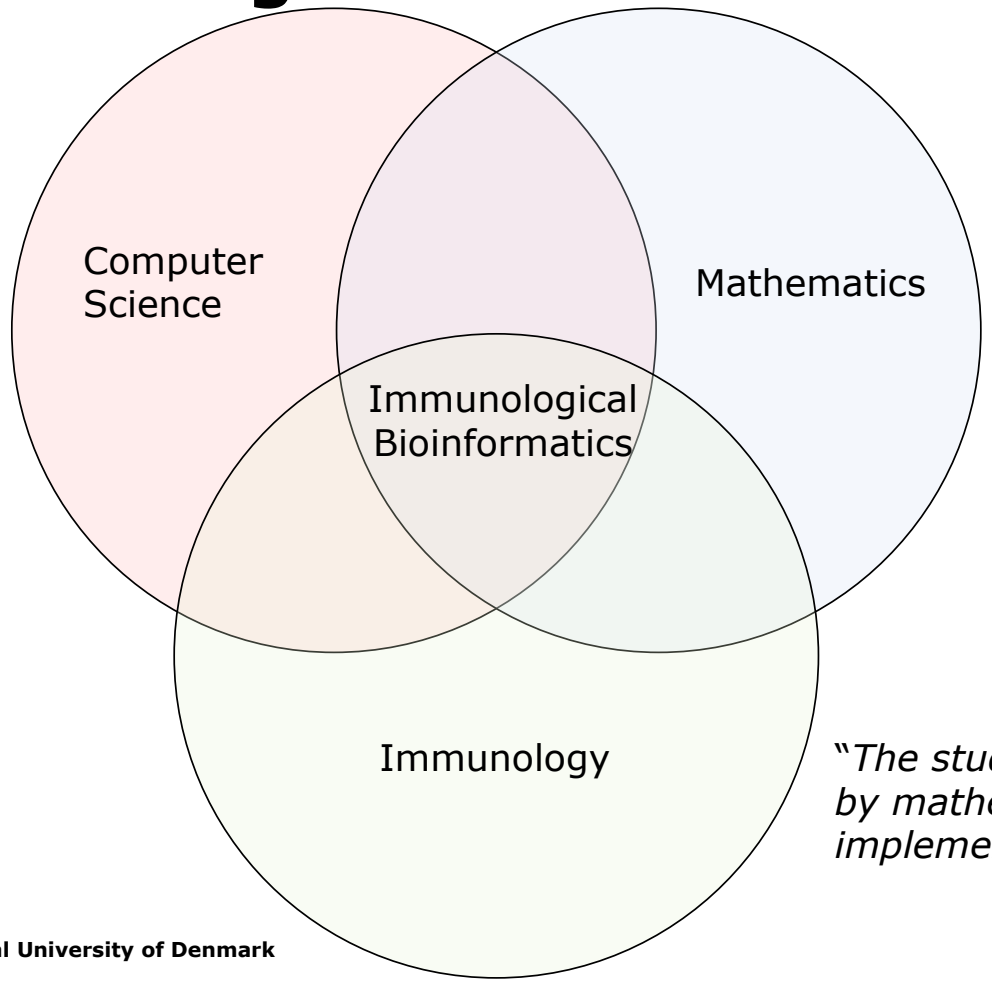
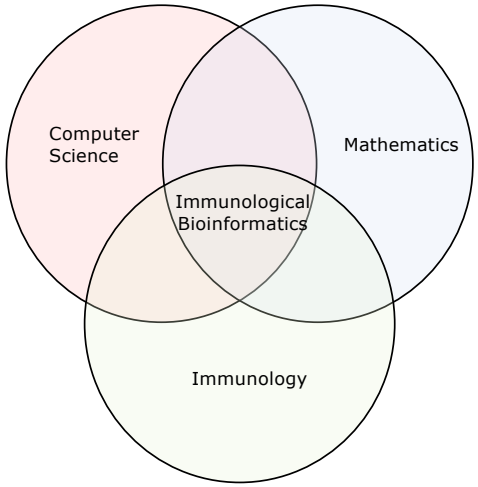
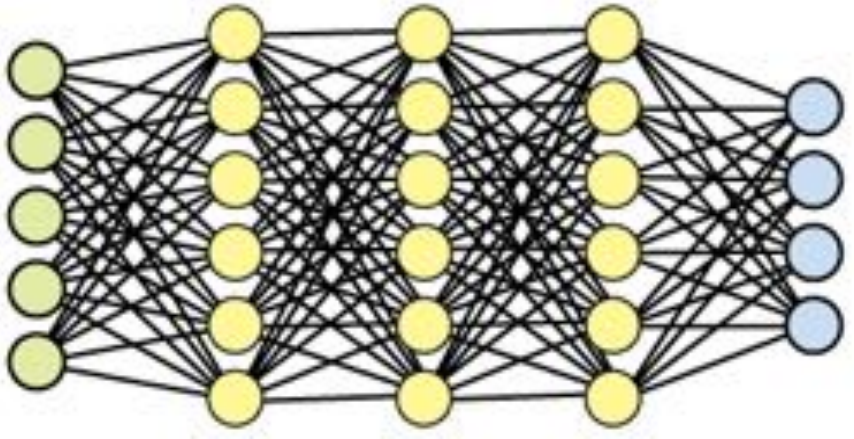


"*The study of the immune system by mathematical modeling implemented using programming*"

What is Immunological Bioinformatics?

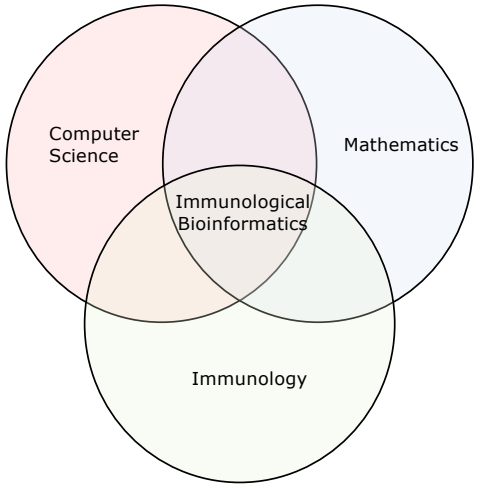
- By modeling the immune system, we can learn how the immune system deals with infections
- The models can be used for targeted design of vaccines against infectious diseases
- The MHC system has been successfully modeled by the group, but there are still much we do not understand
- The models we use are based on machine learning methods and require us to work with collaborators around the globe to get data





What is Immunological Bioinformatics?

- The overall aim of this course is to
  - Introduce you to immunological bioinformatics in the context of vaccine design and cancer
  - Introduce you to a variety of existing tools
  - Understand how they work and can be extended
  - Hopefully you will be able to directly apply what you have learned in your research / further studies

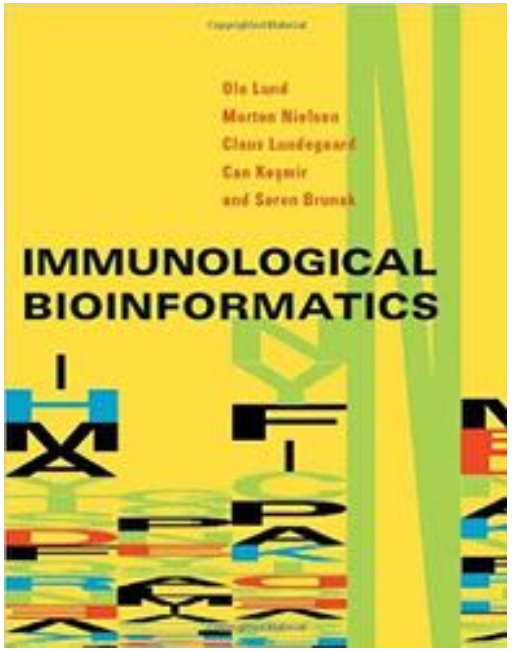


Course Schedule January 2018

- Week 1
  - Tuesday, January 2nd - Introduction, Immunology Brush-up and Databases
  - Wednesday, January 3rd - Immunological Target Identification, Bacterial Pathogenicity and Virulence
  - Thursday, January 4th - B- and T-cell Receptors Genetics and Structure
  - Friday, January 5th - B Cell Epitope Predictions
- Week 2
  - Monday January 8th - T-cell Epitopes
  - Tuesday, January 9th - Antigen Processing and Presentation, Supertypes, HLA Clustering, and Vaccine Design
  - Wednesday, January 10th - Chimeric Antigen Receptor (CAR) Immunotherapy
  - Thursday, January 11th - Cancer Immunology
- Week 3
  - Friday, January 12th - Thursday January 18th - Project Work
  - Friday, January 19th - Exams

Teaching Materials

- The course website is available here: http://teaching.bioinformatics.dtu.dk/36685
- Slides, papers and ”Immunological Bioinformatics” book
- All teaching material will be available online via the course website or DTU inside



Final Project and Exam

- Group project ~4 students/group
- Duration is one week
- Topics will be announced later
- The exam will be a group presentation followed by an individual oral examination