Institute of Bioinformatics
Johannes Kepler University Linz

Special Topics on Bioinformatics: Intro to Biomolecular Structures and Genetics: Exercises and computational tool

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Special Topics on Bioinformatics:
Intro to Biomolecular Structures and Genetics

Times/locations: room T 212, 15:30-18:45

March	Wed. 3 4U
April	Wed. 14
	Wed. 21
May	Wed. 5
	Wed. 12
June	Wed. 2
	Wed. 9

Total: 28U

Week Mon.14 to Fr.18 Paper Report

Week 21-25 Special Topics in Computer Science:
Computational Lab on Microarrays Data Analysis

Jose L. Mosquera UB-PRBB

Special Topics on Bioinformatics:
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Special Topics in Computer Science:
Computational Lab on Microarrays Data Analysis (1PR)

Dipl-Ing Luis Mosquera Mayo

Lab on gene expression experiment using microarrays

Data analysis techniques as preprocessing, filtering, linear models, clustering methods and annotation tools to study the biological significance

R statistical environment with BioConductor packages (linked to Hochreiter lecture on introduction to R)

Prof. Dipl-Ing Sepp Hochreiter

Introduction to R with applications to bioinformatics

Mon 13:45-15:15

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Practical course in Protein folding prediction

Dipl-Ing Christoph Etzlstorfer

Exercises in Computational Chemistry are part of the Organisches Chemisches Praktikum 2

- Types of methods like force field and semiempirical
- Overview on programs and hardware used
- Tutorial and example

Work group of 4-5 students given a small molecule and look for the most stable conformation using PC Model, Hyperchem, Mopac, Tinker (Modeller)

From this SS10 ab initio calculations included

Presentation of their results on a poster

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March Wed. 3 4U

- ✓ What to be given:
  - Overview of the lecture
  - Fundamental concepts of Bioinformatics
    - DNA: Brief molecular introduction and scope in Bioinformatics.
    - Proteins: Brief molecular introduction and scope in Bioinformatics
  - Main genomic and proteomic databases

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March Wed. 3 4U

✓ What to be given:

Papers to analyze and be discussed:

Microarrays, Protein structure prediction and threading

Papers to select and be reported:

Microarrays

Expression arrays, NGS, CNVs, SNPs,

Latest decision time to **select** the papers to report → **14th April 2010**!!!

What do you need to know when reading a paper?

Organization of a scientific report

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Paper analysis

1. Papers to be discussed 6 papers

Microarrays: 4x

- Oligo arrays
- Next Generation Technology and Copy Number Variation
- Alternative annotation

Threading Methods 1x

Protein Strcture Prediction 1x

2. Papers to be reported

Microarrays 22x

Structure Bioinformatics 7x

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- ✓ April — Wed. 14th
  Wed. 21st 8U

What to be given:

Genomics and paper analysis

- ✓ May — Wed. 5th
  Wed.12th 8U

What to be given:

Proteomics and paper analysis

- ✓ June — Wed. 2nd
  Wed. 9th 8U

What to be given:

Correction of the exercises and papers reported by students

Bibliography

- C.A.Orengo, D.T.Jones & J.M.Thornton - Bioinformatics, Genes, Proteins & Computers. Taylor and Francis Group
- Dan E.Krane and Michael L.Raymer-Fundamental concepts of Bioinformatics. Benjaming Cummings
- Arthur M.Lesk -Introduction to Bioinformatics- Second Edition. Oxford
- T.K Attwood & D.J Parry-Smith –Introduction to Bioinformatics-Prentice Hall

Web resources

- **http://www.ruf.rice.edu/~bioslabs/tools/report/reportform.html**
- **http://hampshire.edu/~apmNS/design/RESOURCES/HOW_READ.html**
- **http://www.usca.edu/biogeo/researchguide/writing.html**
- **http://www.sciencegateway.org/rank/index.html**
- **http://in-cites.com/index.html**
- **http://han.ubl.jku.at/han/webofknowledgeisi/admin-apps.isiknowledge.com/JCR/JCR?RQ=HOME**