

Course KB8007 Comparative Genomics, 7.5 hp

Stockholm University, Stockholm Bioinformatics Center, Department of Biochemistry and Biophysics
50% speed during periods 7 and 8, spring 2009

Course goals: to learn current techniques for analysing genomes and how comparative genomics can be used to understand the evolution and function of genomic sequences.

Course book: Zvelebil and Baum, Understanding bioinformatics
Chapters 3, 7, 8, 9, 10, 17

(Basic knowledge about chapters 4, 5, 6, 7, 8, 11, 12, 15, 16 from the intro course KB7004 is assumed)

Course begin/end: 23/3-5/6

Lectures: None. Book chapters are read and discussed weekly with teachers, at 10 am, normally on Fridays.

Practicals: 9 practicals and 3 optional programming assignments. Work at home, at SBC, or at DBB.

Practicals should be finished on the day they are listed, or at the latest the Monday after.

Teachers: Erik Sonnhammer, Kristoffer Forslund

Materials in `~erison/home/Public/`

Anant is away 14/4 – 13/5 but will connect by Skype at 10am CET (unless this is a powercut time).

1. The structure of prokaryotic and eukaryotic genomes; Gene prediction

Chapter 3, 9, 10

Practical 1: Basic genome analysis

Practical 2: Gene prediction

27/3 – ch 3, start pr 1

3/4 – ch 9, finish pr 1

wed 8/4 – ch 10, pr 2

2. Evolution of genes and genomes

Chapter 7, 8

Practical 3: Phylogenetic reconstruction

Practical 4: Phylogenomics

Practical 5: Gene order analysis

17/4 – ch7.1, pr 3

24/4 – ch7.2, pr 4

Thu 30/4 (1pm-) – pr 5

3. Orthology analysis

Chapter 7, 8

Practical 6: Orthology

8/5 – ch 8, pr 6

4. Function and interaction prediction

Chapter 17

Practical 7: Function prediction – transmembrane and localization analysis

Practical 8: Interaction networks

15/5 – ch 17.1, pr 7

Wed 20/5 – ch 17.2, pr 8

5. Finishing, report writing.

Thu 4/6 – all reports should be done.