

## **Assignment 2b, the alternative for the original plan**

Write a report which describes at least one of the following coalescence simulation softwares. What kind of algorithms, statistical inference, for what kind of (biological) questions. Include in your report at least one example from the literature. Here, below, you can find 6 examples, you may use them, or find something more interesting. The example papers are linked to course webpage by using the short titles given here. In these papers many other kind of statistical inference (= other than coalescence) is also used. It is enough that you concentrate on the coalescence inference in the report.

### **Some widely used coalescence simulation programs .**

From their webpages you find links to the papers in which they are published (= description of the algorithms etc.)

BEAST v.1.5.3: <http://beast.bio.ed.ac.uk/Downloads>

Genetree: <http://www.stats.ox.ac.uk/mathgen/software.html>

LAMARC v 2.0: <http://evolution.gs.washington.edu/lamarc>

SIMCOAL: <http://cmpg.unibe.ch/software/simcoal>

Serial SIMCOAL, a Bayesian extension, BayeSSC:

<http://www.stanford.edu/group/hadlylab/ssc/index.html>

### **Some examples, biological question(s) + enlightenment with coalescence**

#### **1. Ancient DNA**

A review paper on ancient DNA studies. The program BEAST has an important role in such studies.

#### **2. Neandertahl and Cro-Magnoid and Europeans**

Various demographic models to explain what has been found by DNA sequences.

#### **3. mtDNA haplotypes**

Serial SIMCOAL application.

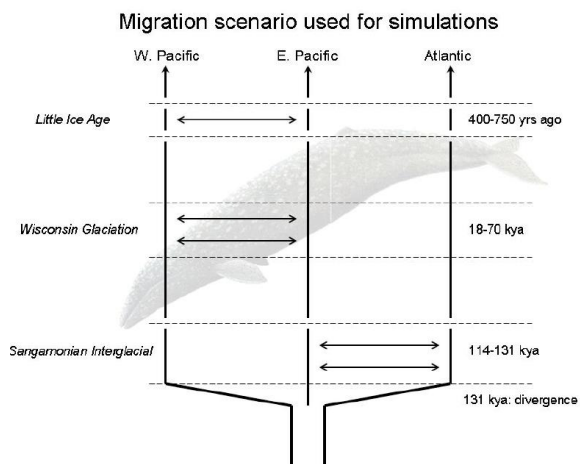
#### **4. Chimp human chromosome coalescence**

## 5. Dating *Mycobacterium tuberculosis* success

## 6. Whale past by coalescence

The programs LAMARC and SIMCOAL are used in this paper.

Not that you may find useful information from Supporting information (most papers have supporting / supplementary information /notes), like this figure:



So, go to the original website of a paper and find more information. Supple-infos have not been linked to course webpage.