

CSC 334: TOPICS IN COMPUTATIONAL BIOLOGY

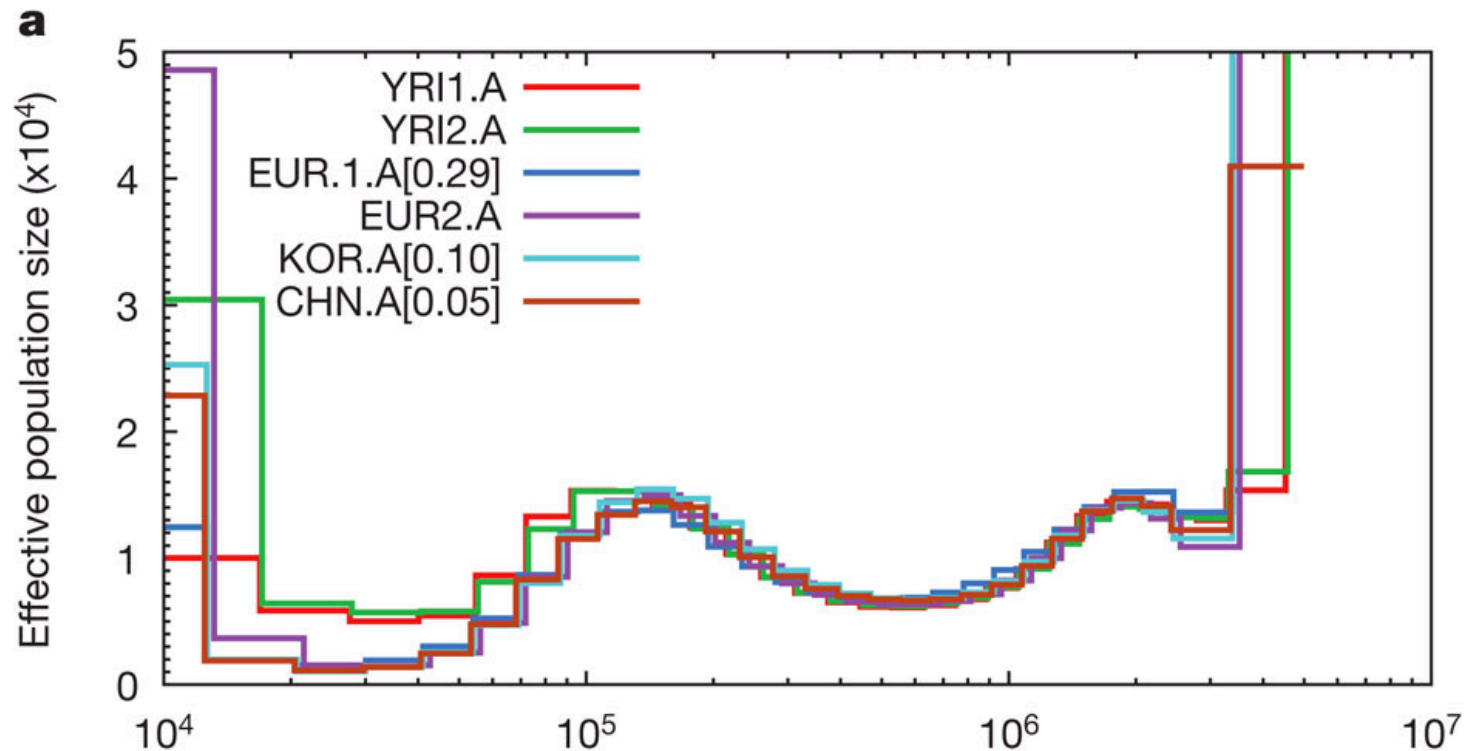
“Algorithms for Genomic Data”

Fall 2015

Smith College

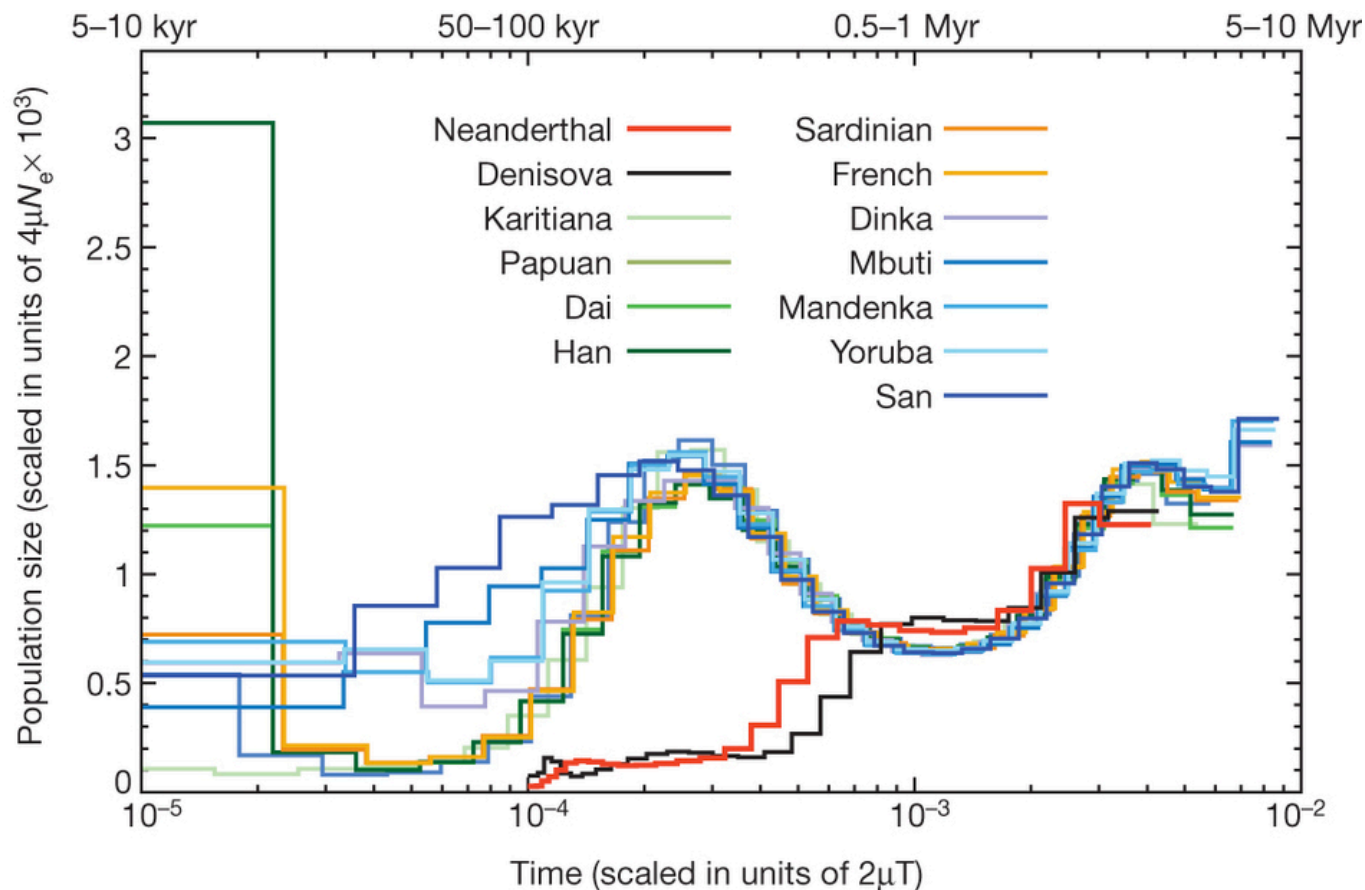
Instructor: Prof. Sara Sheehan

PSMC on modern humans



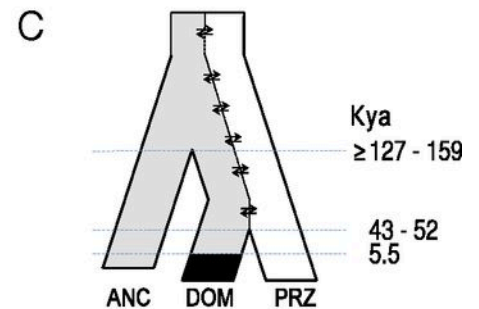
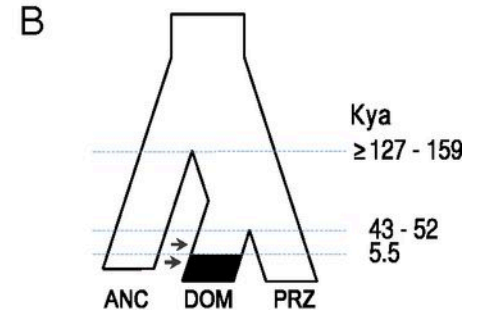
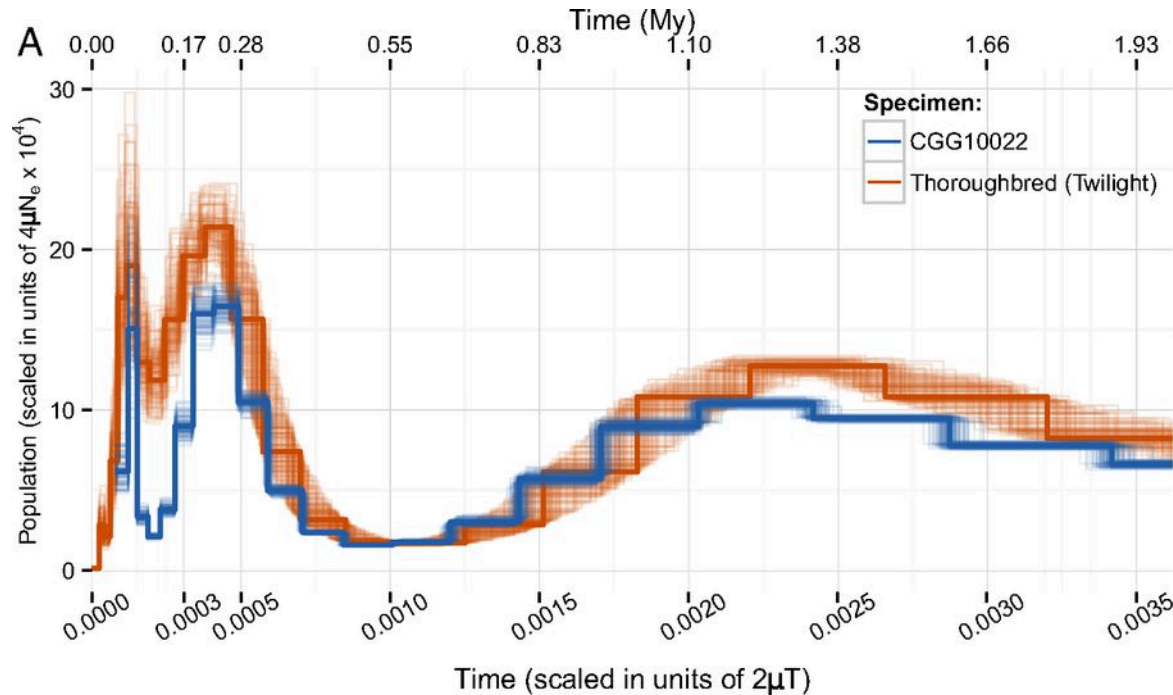
Inference of human population history from individual whole-genome sequences, Li and Durbin (2011)

PSMC on Neanderthal, Denisova



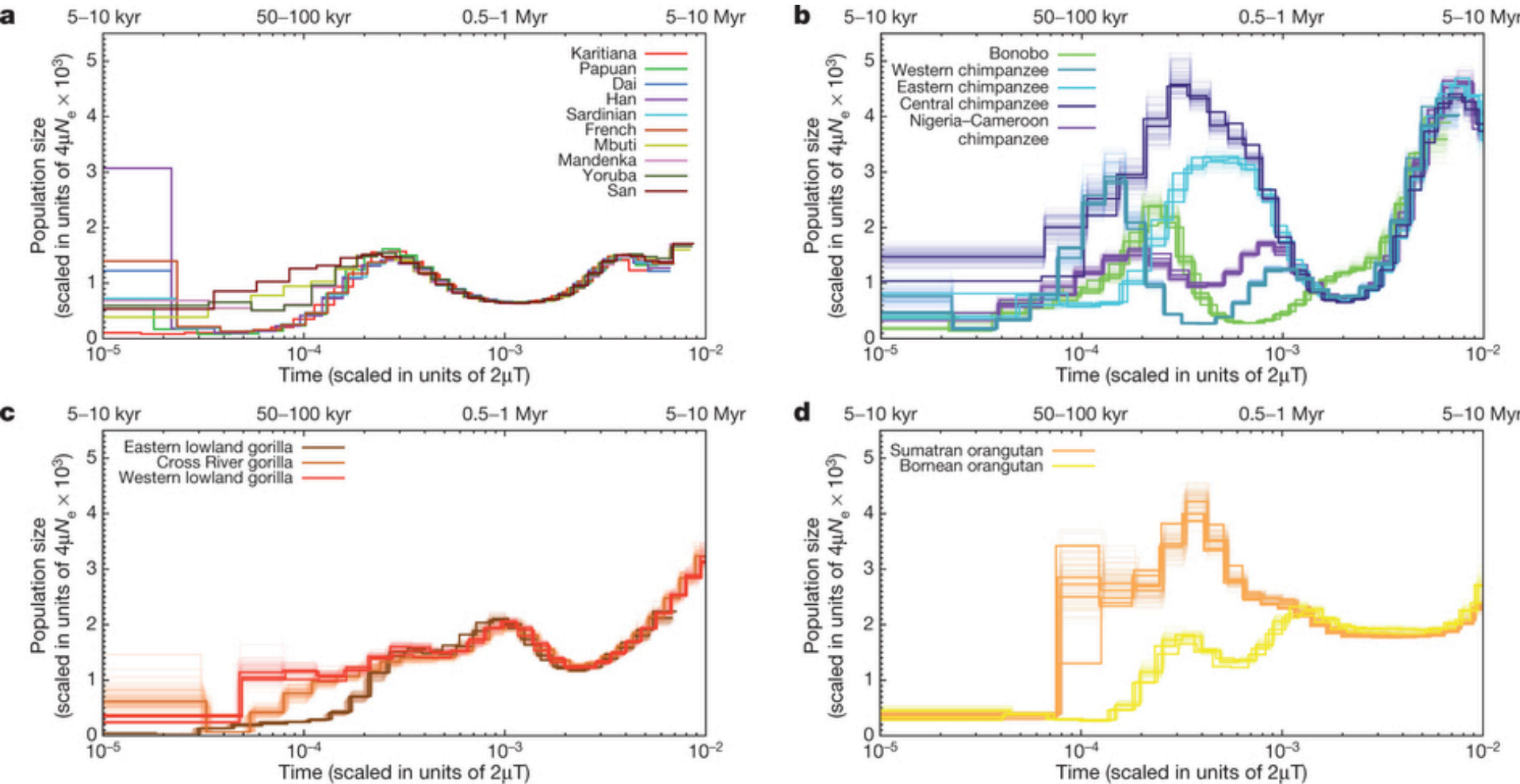
The complete genome sequence of a Neanderthal from the Altai Mountains, Prufer et al (2014)

PSMC on Horses



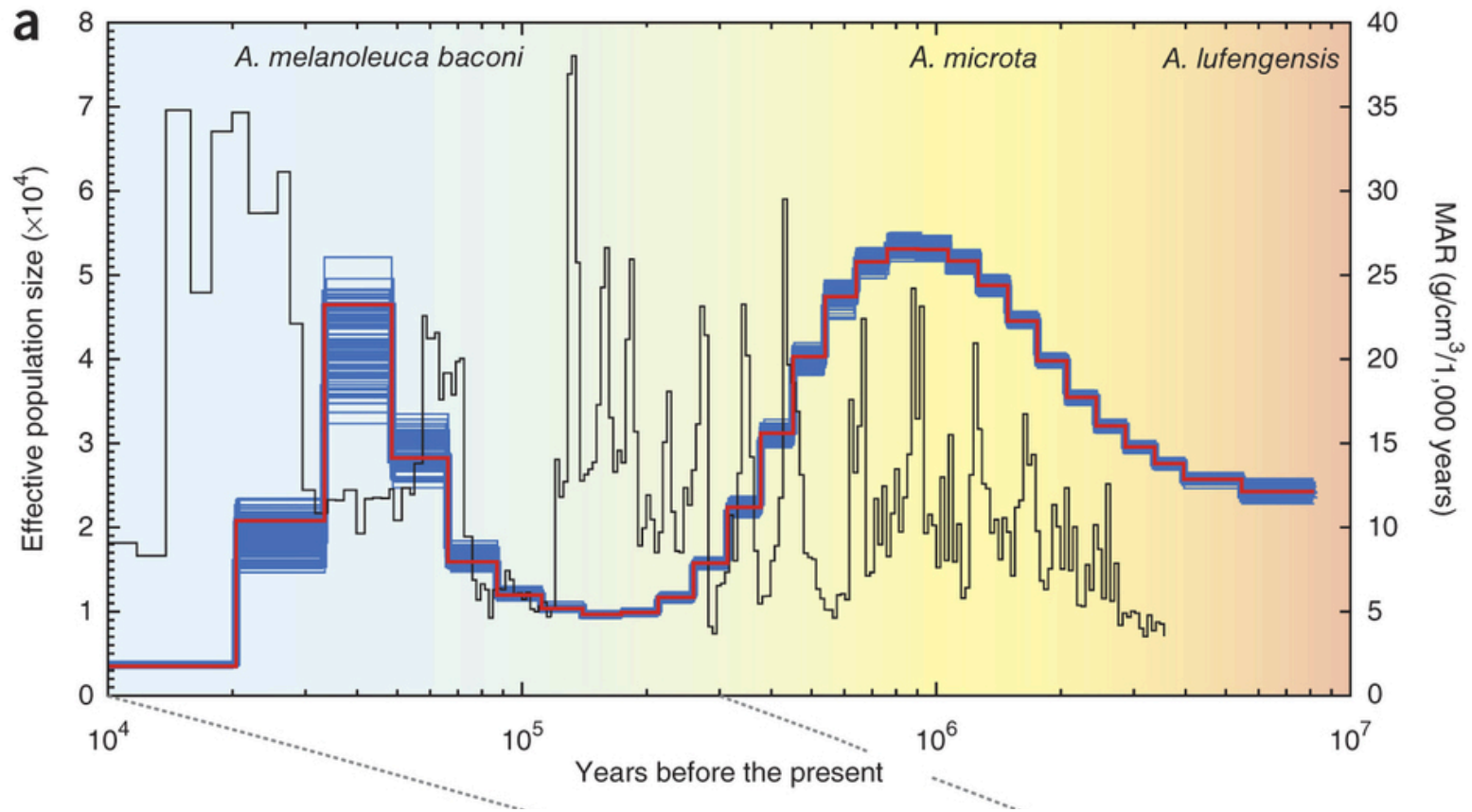
Mikkel Schubert et al. PNAS 2014;111:E5661-E5669

PSMC on Great Apes



Great ape genetic diversity and population history,
Prado-Martinez (2013)

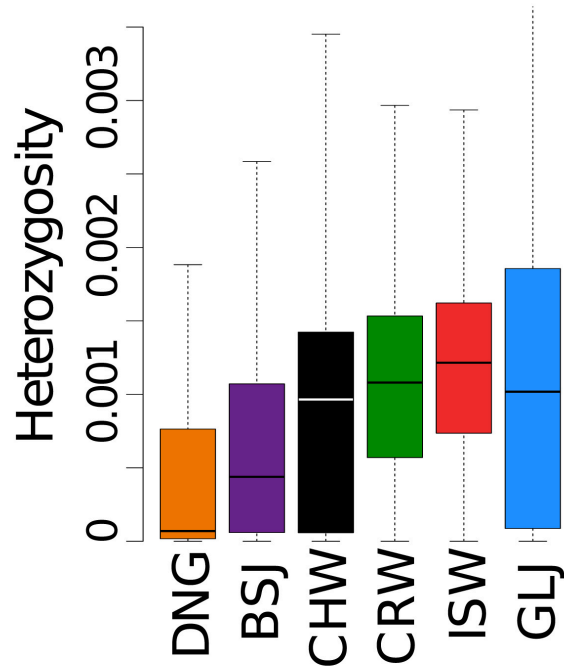
PSMC on Giant Panda



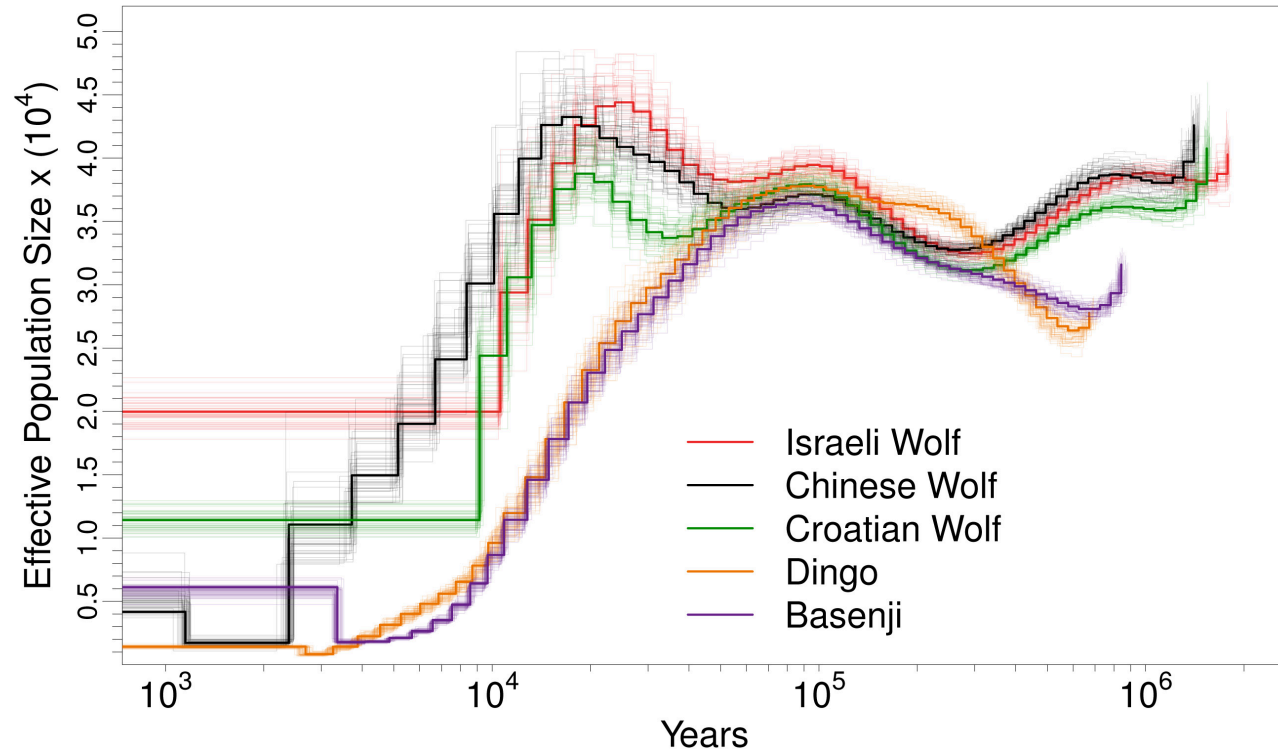
Whole-genome sequencing of giant pandas provides insights into demographic history and local adaptation, Zhao et al, 2012

PSMC on Dogs and Wolves

A

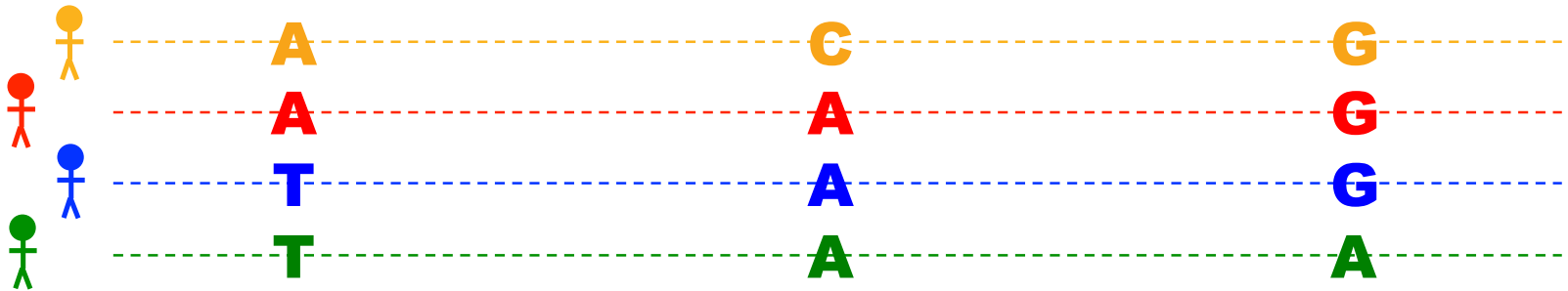


B

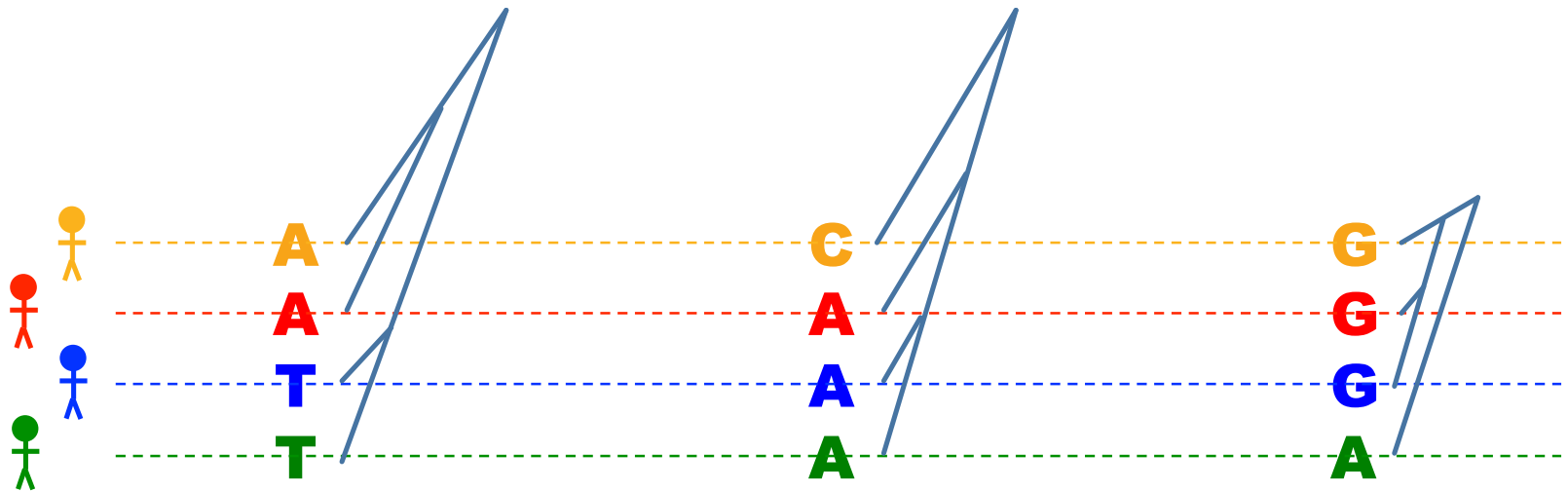


Genome sequencing highlights the dynamic early history of dogs, Freedman et al (2014)

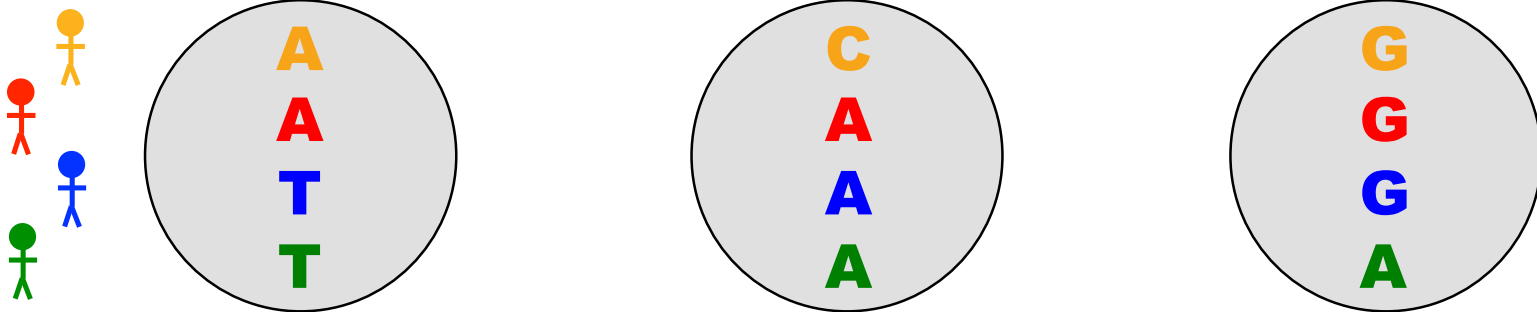
Sequence data at many sites



Tree changes along the sequence



Hidden Markov model: observed data



Hidden Markov model: hidden state

