Hands-on exercises to the lecture „Modern Methods in Drug Discovery" WS15/16

1. The common degu (*Octodon degus*) developpes diabetes quickly upon sugar containing nutrients. Therefore it has been suggest as potential model organism for the study of diabetes and corresponding drugs that i.e. influence insulin.

Retrive the amino acid sequences (FASTA format) of insulin of the following species from UniProt (www.uniprot.org) and perform a multiple alignment with Clustal Omega (www.ebi.ac.uk/Tools/msa/clustalo). Have a look at the clustering. Using the sequence alignment argue if the degu would be a suitable model organism.

human (homo sapiens) INS_HUMAN
pig (sus scrofa) INS_PIG
degu (Octodon degus) INS_OCTDE
chinese hamster (Cricetulus longicaudatus) INS_CRILO
chinchilla (chinchilla chinchilla)
rabbit (oryctolagus cuniculus)
mouse (mus musculus) INS1_MOUSE
rat (rattus norvegicus) INS1_RAT
chimpanzee (pan troglodytes)
Lowland gorilla (gorilla gorilla gorilla)
guinea pig (cavia porcellus)
dog (canis familiaris)
bovine (bos taurus)
sheep (ovis aries)

Have a look at the phylogenetic tree (tab above the multiple sequence alignment output).
Which species (except chimpanzee and gorilla) is thus closest related to human?
Argue upon the sequence alignment if the degu would be a suitable model organism?