Tyler Bradley – ECES T580 Lab 5
Lab 5.1.1

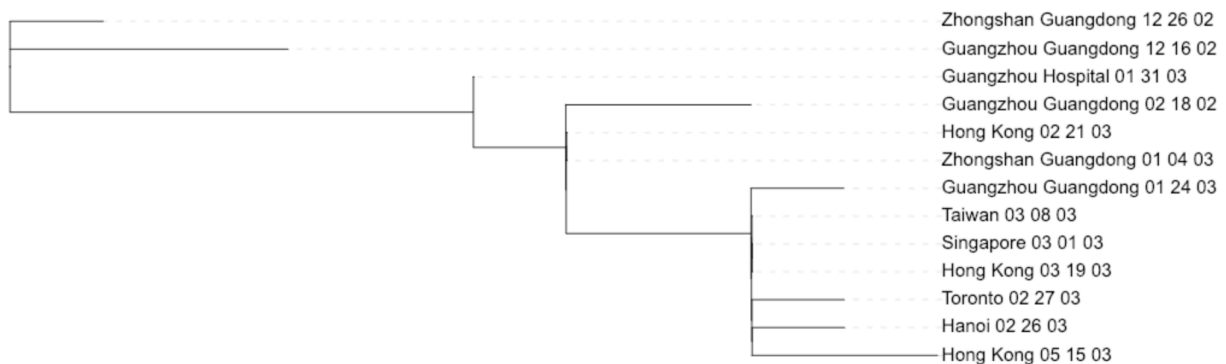Tree scale: 0.1 ⊢━┥

Bovine CoV2
Bovine CoV1
Human CoV OC43
Porcine HEV3
Murine HV1
Murine HV2
Human Sars CoV
Palm civet
IBV3
Feline CoV4
Porcine PEDV

The corovirus that is most closely related to Human SARS CoV is Palm Civet.

Lab 5.2.1 – Online Portion

Tree scale: 0.0001 ⊢━┥

Zhongshan Guangdong 12 26 02
Guangzhou Guangdong 12 16 02
Guangzhou Hospital 01 31 03
Guangzhou Guangdong 02 18 02
Hong Kong 02 21 03
Zhongshan Guangdong 01 04 03
Guangzhou Guangdong 01 24 03
Taiwan 03 08 03
Singapore 03 01 03
Hong Kong 03 19 03
Toronto 02 27 03
Hanoi 02 26 03
Hong Kong 05 15 03

The origin of the SARS epidemic appears to have begun at Gaungzhou Guangdong on Dec 16, 2002 but is also closely related to another strain of the norovirus from 12/26/02 in Zhongshan Guangdong. However, the 12/16/02 strain seems to be more closely related to strains sequenced in the early months of 2003.
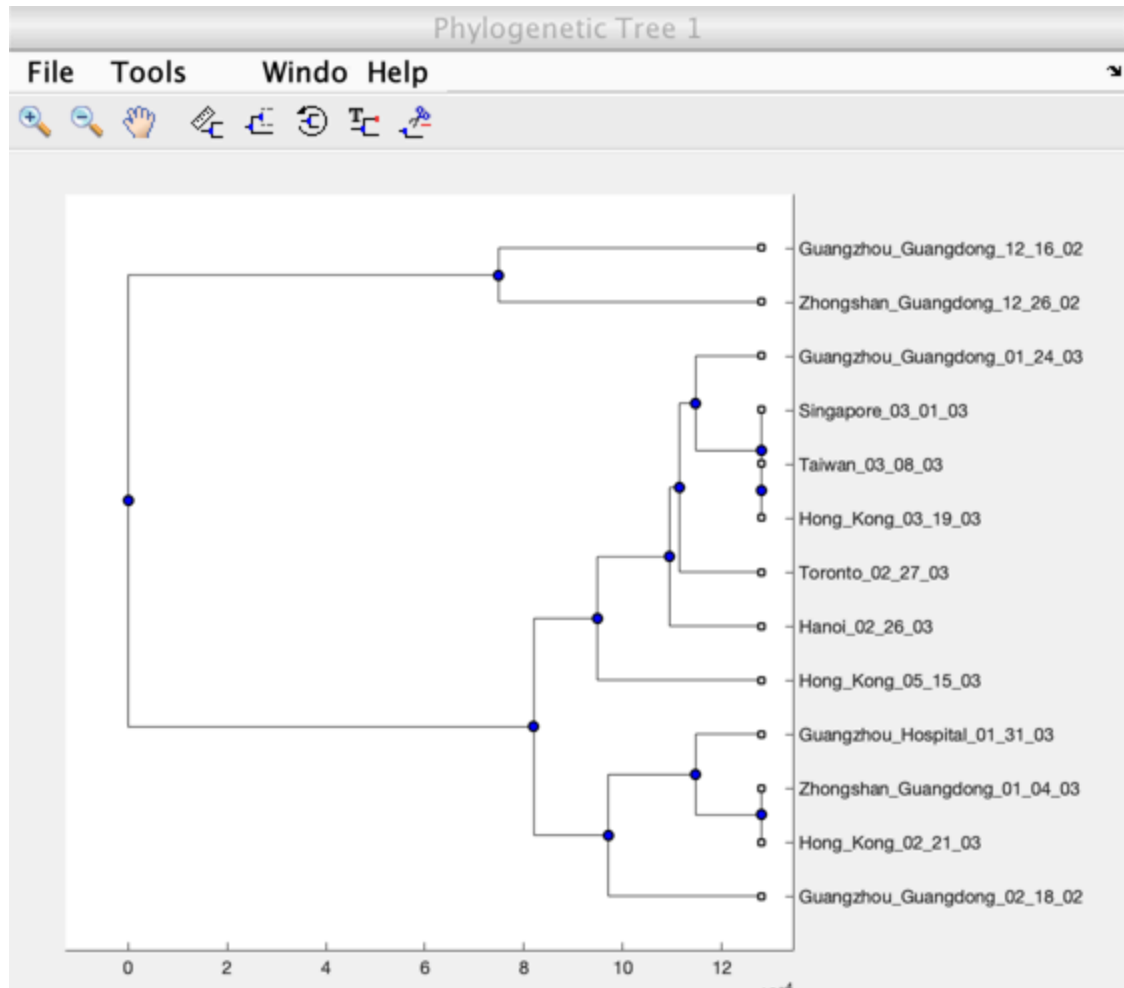
Lab 5.2.1 Matlab Portion

```
seqs = fastaread("SARS_Data_Part_2.fasta");

seq_dist = seqpdist(seqs);

tree = seqlinkage(seq_dist, "average", seqs);

view(tree)

% Overall, the two tree building methods make the same major groupings
 of
% sequences. The two December 2002 sequences are separated from the
 rest of
% the sequences indicating that they are likely they starting point
 and the
% norovirus evolved from that point. However, way in which they are
% separated is slightly different. In the Cipres tree, it appears that
 the
% 12/16/02 sequence is more closely related to the future sequences,
 but in
% the matlab tree, they appear to be equally distant from the rest of
 the
% sequences. The rest of the groupings appear to be fairly similar.
 There
% are some apparent discrepencies that arise due to CIPRES use of
 actual
% branch lengths while matlab appears to normalize branch length in
 favor
% of more clear sub groupings. However, when looking closely, the
 shorted
% branch lengths on the sub nodes near the tree tips correspond with
 more
% closely related seqeunces in the matlab tree. So overall, there is
 good
% agreement between the two methods.
```

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