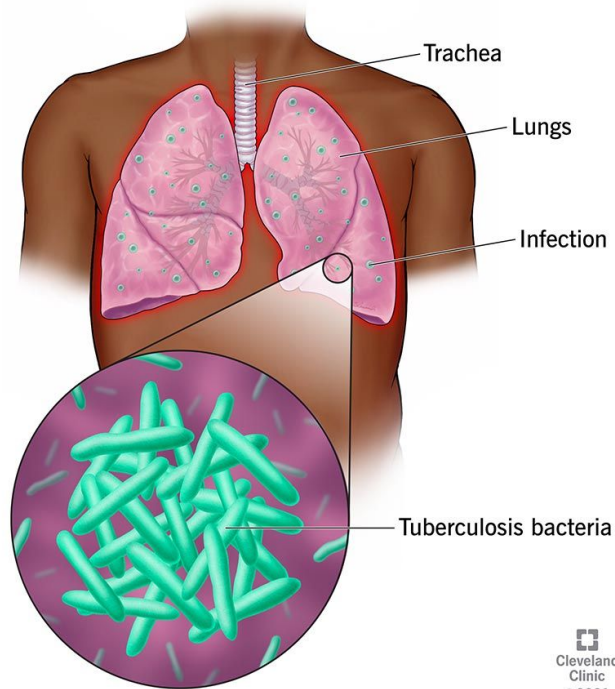
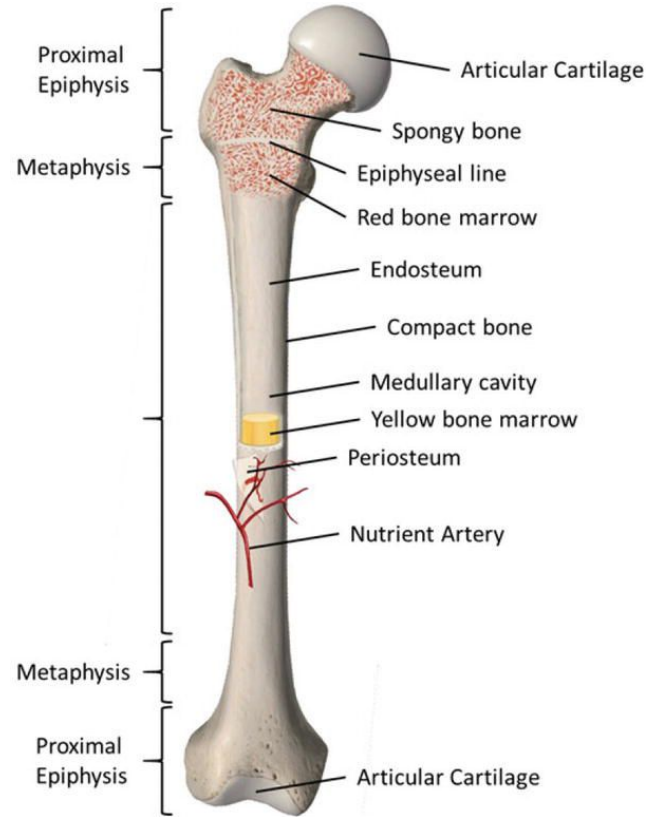


TB WGS Workflow

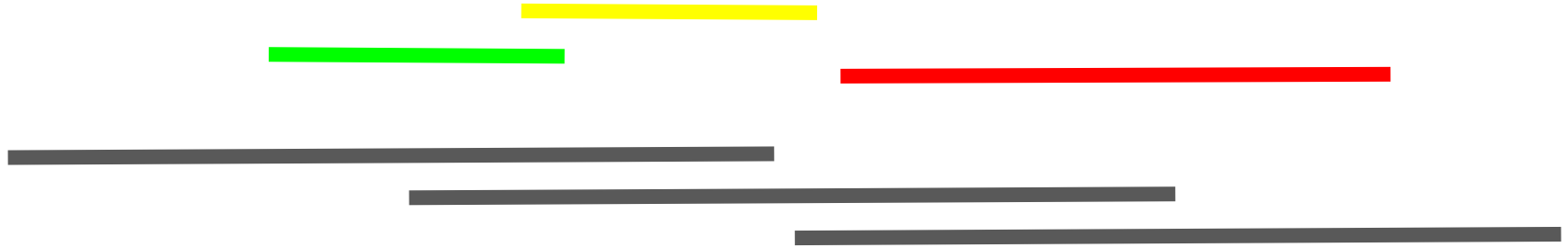
Tuberculosis



Active Pulmonary TB



Dormant TB

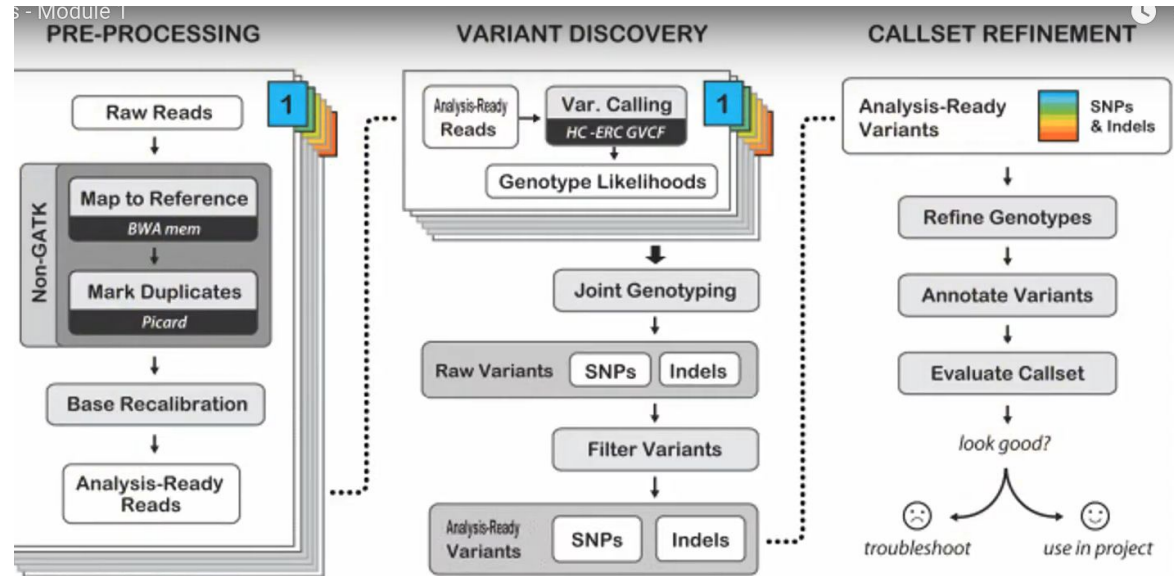


Green: *rpoA* gene; Yellow: *rpoC* gene; Red: *rpoB* gene; Black: *xyz* genes

WGS Raw Data

```
222 CCCGCGCCGAAGTGAAGCGGCACAGGGTGGCTCCGCAATTACCGTGGGTCCCTCGCGACGGGGTCCGCTGCGAGCGGCCATGCAGATCCGGCGCATCGATCCGTGGGCGACGCTGAAGGTGTCGCTGGTGTCTCGTGGTGTCTTCTT
223 +
224 FFFFFFFFFFFFFFFFFF:FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
225 @A00609:384:HV7WKDSX2:3:1101:13566:1501 1:N:0:GAAGCGTT+ACTGAGTG
226 AGGGCTTTCGGCCAGTCGTCGAACCTAAGCCATCAACCGGGCGCGCCGGCCAGCGGCACCCGCGAGTACCGCGTTCGTTCCGCCCTCGGGGTCACTGCGCATATCCAGCGATCCGTCGATCTCCGCCGATAACAGCGTCCTGACGATCTG
227 +
228 F:FF:FF:FFFF:FFFFFFFF:F:FFFFFF,FF:F::,F:F,F:,FFF:,F:FFFFFFFF:::FFFF:FFFFFF,FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF:FF:F:FFFFFFFFFFFFFFFF,FFFF,FFFFFFFFFFFFFFFF
229 @A00609:384:HV7WKDSX2:3:1101:25608:1501 1:N:0:GAAGCGTT+ACTGAGTG
230 ACCTGATCACCTGACAAGCGAAGGGGACGAATTGCGCAAACGCGTCGTGCAAAATTTGGTCCGAACTCGAAACCGTCACCACCTCTACATTGTCCCGGGCGGAACAAAAGAACTTTGTGACGTTGGCCGAGAAGCTAGCGGAGGGCCTCG
231 +
232 FFFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
233 @A00609:384:HV7WKDSX2:3:1101:26485:1517 1:N:0:GAAGCGTT+ACTGAGTG
234 CTGAGGCCACCTCTGCTCATCTCAGGCGGGAACCTCGAAGGGGATTGACGCGTTGACGGGCAATTGCTCGCTGCTCAGGATGAATTCGACCGCCAGCTCGCCCACTTTCGAGATCTCGGGTACCCCATCGTGGAGGAAGTAGACCGTTAC
235 +
236 FFFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFF,FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
237 @A00609:384:HV7WKDSX2:3:1101:23692:1532 1:N:0:GAAGCGTT+ACTGAGTG
238 CTCACGGCCCCGGCGTCTGTCGGCACTCGGCACGCGACGCACGAGGCCACGGCGCTCGGCGCGCTCGATCATACCGGAGACCGTGGACTTGTGAGGCCGAGCAGGGCCGCGAGCTGCGCCATGCGCGGGCGGGCGGTGCGCGACGACGCC
239 +
240 ::FFF:,FF,FFFFFFFF:FFFFFF::FF:FFFF,FFF,F:F:FF,FF:FF,,F:FFFF,FFFFFFFF,FF:FF,,FFFFFFFFF,,:FFFFFF,FFF,F:FFFFFFFFF:FFFF,FFFFFFFF,FFF,FFF:FFF:FFF
241 @A00609:384:HV7WKDSX2:3:1101:27905:1532 1:N:0:GAAGCGTT+ACTGAGTG
242 CTTCTCCGCTGATCCCCCAGCCCCACGCGGATTTTGACAAATGTCGCGAAAGCGGCGCGCAACGTGACATTTTTGGCAATGTGGGGGGGTGTCAGGGGGTCTCGCGCCGACCAGCACGGTCGGCAGCCCCGGGCGCGCTG
243 +
244 FFFFFFFFFFFFFFFFFFFFFFFFFF,,F,F,,,FF,,,F,,,F,,,::,,,::F,,,::,F,F,,,F,,,FFF,:F,,,::F:F,,,::F:,F,F,F,,F:,F,,F,F,F,F:F:,F
245 @A00609:384:HV7WKDSX2:3:1101:28212:1532 1:N:0:GAAGCGTT+ACTGAGTG
246 CGACACGTCGAGCGCACTGGTGGGCTCGTCGGCGATCAGCACCTGCGGCTTCAGCGACAGCGCGCGGGCGATGCCGACGCGCTGCTTCTGGCCGCCGAGAGCTCGTGGGGAACCGGCTGCGGTAGGCGCGCGGCTGCTCGACGCTGTC
247 +
248 FFFFFFFF:FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
249 @A00609:384:HV7WKDSX2:3:1101:14624:1548 1:N:0:GAAGCGTT+ACTGAGTG
250 CGAGTTCGCGGATGGAGGTGGCGTGATCTCGCGCAGCCGGTCCGGCTGCGGTATCGAGCGGCGCGCGCACTTCTCCAGCAGCTGCTTGATTATCGTGCCGATGCGCATCACCTTGGCGGGTGTTCGACGAGATCGGTGACCG
251 +
252 FFFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
253 @A00609:384:HV7WKDSX2:3:1101:29396:1548 1:N:0:GAAGCGTT+ACTGAGTG
254 CAATGCGCTGGCGGCCGCCGCGTTGGCCCGCGCGGTGGGCACTCCGCGCGGATATCGCGCGCACTGCGGGCGCTTTCAGGTGGGGCGGCATCGCGCCGAGCTGGTGGCCCTGTGCGCGATGTGCGTTATGTGGATGACTCCAAGGC
255 +
256 FFFFFFFFFFFFFFFFFFFFFFFFFF:FFFF:FFF:FFF:FFFF:FFF,FF:FFFF,,F,FFFFFFFFFFF,FFF,F,F:F,:FF:F:F,FF
```

WGS Data Processing Pipeline



WGS Analysis tools

- Quality control- FastQC
- Trimming- Trimmomatic; CutAdapt
- Mapping/Alignment: BWA
- Variant Calling: GATK; SAMtools
- Annotation: Annovar; SNPeff
- Phylogenetic analysis: IQ-TREE; BEAST; FASTTREE