

## Maternal Lineage (activity)

### The PCR amplification of the mitochondrial control region

There are 2 hypervariable regions within the control region of the mitochondria. This exercise amplifies just one of these. For more definitive results, both should be amplified and sequenced. This exercise will permit us to have a rough idea of the origins of our maternal line and we will be able to attribute ourselves to various tribes throughout the world. The human mitochondrial genome ([genbank file](#)).

**Forward Primer** 5' -TTAACTCCACCATTAGCACC-3'

**Reverse Primer** 5' -GAGGATGGTGGTCAAGGGAC-3'

1. PCR the previously extract DNA samples
  - Pour 2% agarose into casting apparatus in refrigerator
  - 2 gels per class need to be made ? 100ml of TBE with 2g agarose
  - add 5?l SYBR safe solution into the molten agarose before casting
  - place 2 sets of combs into the gel ? at one end and in the middle
2. load gel with DNA ladder and PCR
3. Run gel at 120V for 20 minutes
4. Visualize on UV transilluminator
5. Document with camera to verify amplification
6. The instructor will submit the viable reactions for sequencing
7. **Analyze data during Bioinformatics Lab session**
  1. Using NYCCT email address, register for account at <http://dnasubway.iplantcollaborative.org/>
  2. retrieve reference mitochondrial sequences
  3. perform multiple sequence alignment using [MUSCLE](#)
  4. draw phylogenetic trees using [PHYLP](#) and visualize using [FigTree](#)

Tags: [cultural awareness](#), [cross-cultural communication](#), [life-long learning](#), [breadth of knowledge](#)