

Alu Insertion (activity)

Alu's are unique SINEs that appear in the primate lineage and reveal the lineage and diversification of primates. While retrotransposons can disrupt gene (as in some cases of hemophilia), they often land outside of genes or within introns without effect. One example of a non-disruptive *Alu* element in humans is found in the location called [PV92](#) on chromosome 16. This element is of the youngest subfamily of *Alu*, called [Ya5](#).

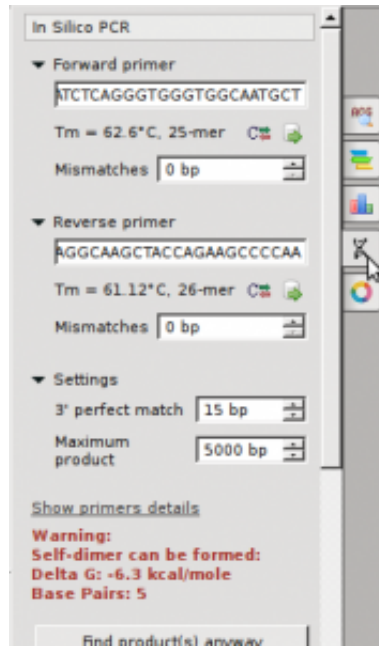
Since PV92 does not cause any deleterious effects, it can be used as a non-selected marker to illustrate lineage. Some people have an *Alu* element in this location while others do not. The presence or absence of this marker is viewed as an allele. This lab uses primer that flank the location of the *Alu* insertion that span 416 bp. If an *Alu* is present, the amplified DNA will be 300bp larger (the size of an *Alu*) at 731bp.

Exercise: In silico PCR of PV92

Forward primer: 5' GGATCTCAGGGTGGGTGGCAATGCT 3'

Reverse primer: 5' GAAAGGCAAGCTACCAGAAGCCCCAA 3'

1. Perform Virtual PCR **Informatics Exercise/Discussion**
2. Visit BLAST: https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE_TYPE=BlastSearch
3. Paste both primers: GGATCTCAGGGTGGGTGGCAATGCT
GAAAGGCAAGCTACCAGAAGCCCCAA
4. Choose "Somewhat Similar"
 - Locate the locus of the product and the size
5. Find the PCR fragments in Ugene
 1. Download the sample FASTA file: [PV92 sample](#)
 2. Open the file in Ugene and select option "As Separate Sequences in Viewer"
 3. Select the "In Silico PCR" button on the far right (double helix button) and insert the primers



4. A PCR product should be noted for one of the sequences after pressing “Find Products anyway”
5. Click on the second sequence in the viewer and Press “Find Products anyway”

Exercise: PCR genotype PV92 locus

1. PCR the individual samples
2. Pour 2% agarose into casting apparatus in refrigerator
 - 2 gels per class need to be made ? 100ml of TBE with 2g agarose
 - add 5 μ 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
3. Load DNA ladder and PCR samples
4. Run gel at 120V for 30 minutes
5. Visualize on UV transilluminator
6. Score gels for the presence/absence of the alleles to determine genotype frequency in the class

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