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## UNIQUE MYTILIDAE MUSSELS AND THEIR MITOCHONDRIAL DNA INHERITANCE

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Certain species of marine mussels, specifically those in the *Mytilus* genus, have been found to exhibit a unique system of mitochondrial DNA (mtDNA) inheritance known as Doubly Uniparental Inheritance (DUI). Instead of the typical exclusive maternal mtDNA inheritance found in most animals, this type of inheritance involves paternal as well as maternal inheritance. *Mytilus* species have two distinct mitochondrial genomes,



known as the F genome (maternal) and the M genome (paternal). The genome is 17kb long, it codes for 13 proteins and it has five unassigned regions, one of which is large and hypothesized to be the control region. The F and M genomes are highly divergent (~20%) within a population, but every once in a while the F genome can assume the role of the M genome and sneak into the paternal line. This is referred to as a masculinization event and it results in a recently masculinized (RM) genome. During a masculinization event, recombination creates a “chimeric” RM genome consisting of protein coding and ribosomal genes from the F genome, the control region from the F genome and the control region from the original standard M (SM) genome. It has been suggested that this SM control region (or at least part of it) is homologous in all male Mytilidae mussels, that it plays a critical role in the mechanism behind the DUI system and that it may influence sex determination. The goal of this project was to amplify and sequence the control region in two mussel species (*Modiolus modiolus* and RM *M. edulis*) to see if this hypothesis is supported. PCR amplification and sex-specific, control region flanking primers in the CytB and 16S genes were used. The control region amplifications for both of these species yielded faint, positive results; therefore, further amplification, cloning and sequencing is being done.

**Lauren Del Bel** graduated from KVHS in 2006. Lauren is currently finishing her fourth year at Acadia University as an Honours Biology Major. She is a member of the Acadia Biology Society, a Teacher Assistant for various Biology classes and has enjoyed her time at Acadia. When she graduates she is planning to attend the University of Toronto to pursue a Masters degree in Molecular Genetics, with a focus in Developmental Biology.

