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## **Proteomics and Molecular Medicine**

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## Advancements in Bioinformatics and Drug Discovery

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Ovine hepatic mitochondrial membrane proteome: assessing mechanisms of seasonal weight loss tolerance using blue native PAGE coupled to mass spectrometry

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**S** easonal weight loss (SWL) constrains production anywhere wet and dry seasons exist. A cost-effective solution to SWL is rearing sheep breeds that can withstand nutritional stress. Previous studies on the muscle of the Damara and Merino show that the Damara has a distinct fatty acid metabolic process to adapt to SWL. In this study, we juxtaposed the hepatic mitochondrial proteome of both breeds (n=12 for each breed) on two diets (feed restriction vs control) over 42 days. Mitochondria were isolated and washed by ultra-centrifugation. Initial protein concentration was then determined using the Bradford method. Proteins from the resultant pellet were extracted via digitonin detergent to a final concentration of 2% (w/v). Blue native PAGE and two-dimensional gel electrophoresis (2DE) were combined to identify and quantify the proteome. Gene ontology was summarized using the online tool ReviGO to contextualize each protein's role. Significant changes in abundance of proteins were based on ANOVA (P<0.05) and fold-change (>1.5). A total of 50 proteins were identified and quantified with several differentially abundant proteins being of interest across one or more comparisons. Proteins present in greater abundance in the Damara included amine oxidase and glutamate dehydrogenase, which functions that include fatty acid and sterol metabolic processes and immune responsiveness. Abundance patterns of these proteins in the Damara compared to the Merino suggest a unique fatty acid and sterol metabolism as an adaptation to SWL as previously described but also an adaptive immune response to chronic nutritional stress.

## **Biography**

Blake A. Miller is completing his PhD from Ross University School of Veterinary Medicine in St. Kitts. His background is on postgenomics technologies and their applications in diagnostics and selection indices.

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