

Wednesday, April 2nd, 2014

LSC 3 - Life Sciences Centre

2350 Health Sciences Mall

**12-1pm**



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### **“Transfusion science of blood safety”**

As a blood banking organization, Canadian Blood Services is committed to blood component quality and safety. The protection of our blood supply is challenged by pathogens such as bacteria and viruses and in addition to the testing of donors for specific pathogens, pathogen reduction technologies (PRTs) have been developed to provide a broad pathogen killing capacity. Research studies have concluded that these technologies are two sides of a coin: the benefit of a reduction of pathogens and a negative impact of blood component quality.

This presentation will display some examples of studies trying to understand the impact of PRTs on blood component quality using biochemical and cell biological methods such as proteomics and signal transduction analyses. During storage under blood bank conditions, the quality of the blood components show signs of deterioration as demonstrated by changes in *in vitro* parameters. This observation is called the storage lesion and it is crucial to understand its impact on the biochemistry and physiology of blood components in order to devise strategies to reduce its impact on blood components' shelf-life and safety. Gel-free and gel based proteomic approaches identified proteins changing upon treatment linked to signaling pathways involved in the damage. Iterative research strategies hopefully will lead to the identification of protein biomarkers that point to sites for intervention. These proteins show involvement in diverse aspects of platelet function such as platelet activation, apoptosis or the recently appreciated capacity for protein synthesis. Lastly, alterations in the treatment set-up such as treatment timing and whole blood treatment vs individual component treatment demonstrated the influence of specific process steps in blood product quality. Consequently, these research efforts are necessary to assess the mechanisms leading to the observed damage and are potentially hampering the function of the blood components which might affect the transfusion outcome.

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