

6th International Conference on

Biomarkers & Clinical Research

August 31-September 02, 2015 Toronto, Canada

Investigating long-term stability of sulfur and fluorine based adlayers on stainless steel stent models

Rohan R Ravindranath^{1,2}, Alexander D Romaschin¹ and Michael Thompson²

¹St. Michael's Hospital, Canada

²University Of Toronto, Canada

Nanomedicine continues to be an emerging discipline, providing novel solutions to diseases that otherwise could not be treated effectively. The development and use of self-assembled monolayers and adlayers for biomedical applications has allowed bio-incompatible materials such as stainless steel and cobalt-chromium, to be used as effective medical devices. In terms of stainless steel, this material has been widely used to develop stent implants. Stents are expandable tubes used to open up a restricted artery. Conventional implantation of a bare metal stent can cause renarrowing of the artery over time restenosis, due to an immune response launched by the body towards the “foreign” stent. As a result, improving the biocompatibility of stainless steel is thought to be critical for creating a stent that is not rejected by the body. Benzoethiosulfonate (BTS) and Pentafluorophenyl Ester (PFP) are two chemical molecules that have previously been used as surface modifiers of stainless steel and quartz. BTS was recently used as a surface coating on stainless steel to bind antibodies, which could then in principle be used to bind specific biomarkers on circulating endothelial cells. For this stent application, it is important that the surface coatings show minimal chemical change over time, when placed in a physiological environment. This investigation involved assessing the long-term stability of BTS and PFP coatings on stainless steel. Surface characterization techniques like X-ray photoelectron spectroscopy, contact angle goniometry and atomic force microscopy were used to analyze the integrity and composition of the adlayers upon immersion in physiological buffer solution.

Biography

Rohan R Ravindranath completed his BSc (Hons) from the University of Toronto in Chemistry and Biotechnology. Currently, he is pursuing his MSc in Chemistry under the joint guidance of Professor Michael Thompson and Professor Alexander Romaschin at the University of Toronto and at St. Michael's hospital. He has presented his past research at various local conferences and has been awarded a best poster prize.

rohan.ravindranath@mail.utoronto.ca

Notes: