

بسمه تعالی

# اطلاعیه برگزاری سمینار علمی

عنوان:

## Plasma Polymers for Selective Cell Adhesion

ارائه دهنده:

**Sara Babaei, PhD**

Plasma Processing Laboratory,

Department of Chemical Engineering

McGill University, Montreal, QC, Canada

### Abstract:

In the first part of this research, a study on the design of a suitable set of coatings was carried out. Plasma polymerization of binary gas mixtures of a hydrocarbon and a heteroatom containing gas took place in a low-pressure glow discharge reactor to produce plasma polymers with tuneable concentration of N and O functional groups. The deposition parameters controlled the composition of the coatings and, subsequently, their surface charge between -28 mV and 26 mV at physiological pH.

We also studied the effect of surface chemistry and protein adsorption on adhesion and differentiation of inflammatory cells to plasma polymer films containing tuneable concentrations of N and O functional groups. The protein adsorption measurements obtained from surface plasmon resonance, in line with cell culture experiments, suggests that presence of albumin on our surfaces may be an indicator of monocyte adhesion to the studied plasma polymers.

As a novel biomedical application of plasma polymers, we showed that plasma polymer films can be used to separate two different types of mouse cells, namely fibroblast and pancreatic cells, and demonstrated promising features suitable for cell sorting applications.

Sterilization is an inevitable step before any material could be used in medical applications. However, the sterilization procedures could alter the desirable characteristics brought by the surface modification. To investigate the impact of sterilization, the alterations in the physio-chemical properties and bio-performance of plasma polymers were studied after various types of sterilization techniques. The results revealed that different sterilization techniques had varying effects on the plasma polymer films of different compositions.

Overall, all these findings provide a foundation to understand how cell and plasma polymer interactions can be governed by the design of surface properties. Moreover, the separation of two different cell types by plasma polymers opens up new opportunities to design novel adhesion-based cell sorting devices.

مکان ارائه: سالن آمفی تئاتر پژوهشکده لیزر و پلاسما

زمان ارائه: دوشنبه ۹۷/۱/۲۰ ساعت: ۱۵:۳۰