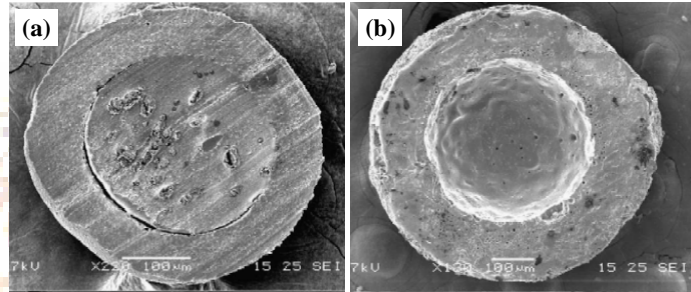


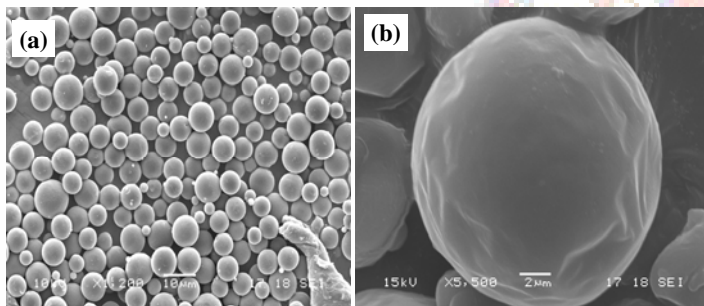
## Drug Delivery Systems – Fabrication of Drug Delivery Devices

### Polymeric Microspheres for Drug delivery...

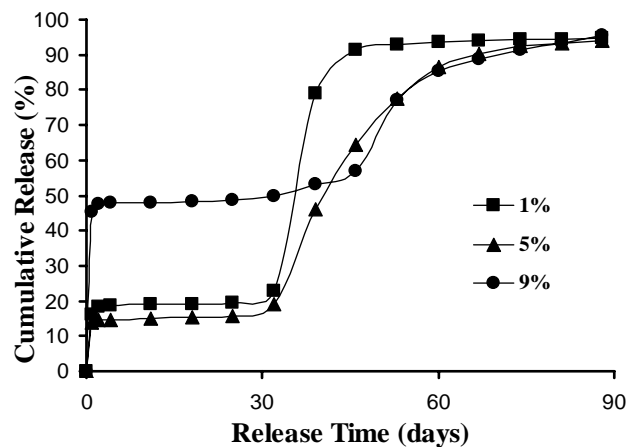
Controlled release systems using drug-loaded polymeric microparticles are widely studied in drug delivery research due to their advantages over conventional methods of drug administration. Conventional drug administration methods are usually accompanied by problems such as high dosage requirement, which leads to toxicity problems and other side effects. Most of these problems can be eliminated when polymeric micro-carriers are used for drug delivery. In the past years, our group has carried out much research on the fabrication of drug encapsulated microspheres using different polymers such as PLA, PLGA, PCL etc.



SEM pictures of double-walled PLLA-PLGA microspheres fabricated using modified oil-in-oil-in-water (O/O/W) emulsion solvent evaporation technique, (a) Etanidazole loaded microsphere; (b) unloaded microsphere

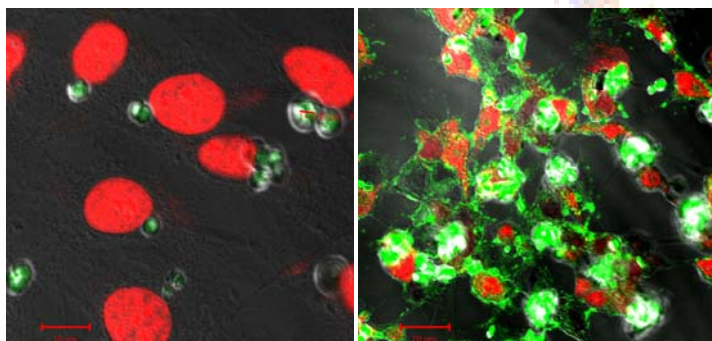


SEM pictures of Taxol loaded PCL microspheres fabricated using EHDA (a) Overall view showing nearly monodispersity (b) Close-up on single microsphere illustrating the morphology



Release profile of PLGA 65:35 discs of 0.5 mm thickness (diameter = 5 mm) for various drug loadings.

The common methods used in fabrication of the drug delivery devices include single emulsion, double emulsion and spray drying. Besides these conventional methods, we also look into alternative fabrication methods such as using the ElectroHydroDynamic Atomizer (EHDA). This method is found to produce PCL microspheres with high monodispersity and good spherical morphology. Our research efforts in this field include characterization and modification of the properties of the microparticles fabricated. Drug encapsulation efficiency and *in vitro* release studies are also carried out for the drug carriers produced. *In vivo* experiments and animal tests are also conducted to study the efficacy and characteristics of the drug delivery devices fabricated.



CLSM images of Glioma C6 (brain tumor) cells after incubation with coumarin-6 loaded PCL microparticles

Contact: Dr. Wang Chi-Hwa  
6874 5079  
chewch@nus.edu.sg