

## Nanotechnology and targeted drug delivery

Topics to be covered in one-day course (Course Module 3):

### The challenges of drug delivery

- Common aims of drug delivery
- Blood-brain and other neural barriers
- Traditional drug delivery routes (peroral, intravenous, etc.)
- Gastrointestinal tract drug delivery
- Transdermal drug delivery
- Transmucosal drug delivery
- Some key target areas for the application of nanotechnology to drug delivery

### Nanoparticulate systems used for drug delivery and their potential applications

- Polymeric nanoparticles (PNPs)
- Polyketal nanoparticles
- Nanoparticle-aptamer conjugates
- Colloidal gold nanoparticles
- Dendrimers
- Hyperbranched polymers
- Dendritic polymer-drug conjugates
- Nanoshells
- Nanocrystals
- Quantum dots
- Nanoliposomes (nanosomes)
- Micelles
- Fullerenes and carbon nanotubes
- Carbon nanohorns
- Chitosan and lecithin nanoparticles
- Nanodiamonds
- 'Smart' Bio-nanotubes
- Implantable drug-carrying nanofilms
- Multifunctional particles and systems
- Theranostic approaches

### Performance and safety issues

- Efficacy
- Toxicology
- Regulatory aspects of new delivery systems