

Preparation of pH-sensitive nanoparticles and application as actively targetable drug delivery systems for the treatment of cancer

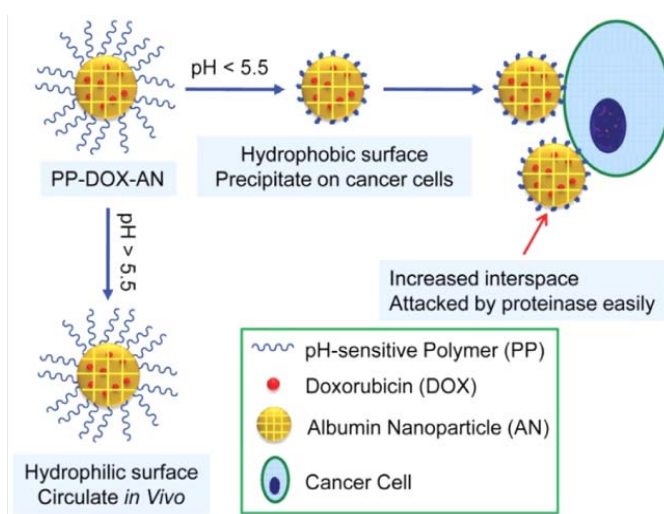
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Nature of work: develop a novel drug delivery system for the treatment of cancer

Area: advanced drug delivery systems

Funding: Via the various University scholarship schemes (see separate information for these).

Brief description: Current cancer chemotherapeutic drugs often kill healthy cells and cause toxicity to the patient. This research project is to be aimed at developing a novel drug delivery system for the treatment of cancer that can reduce or eliminate the toxicity to normal healthy cells. Doxorubicin (DOX) loaded and pH-sensitive polymer (PP) conjugated albumin nanoparticles (AN) (PP-DOX-AN) will circulate in blood stream (pH = 7.4) with a significantly long circulation half-life due to hydrophilic PP on the surface. However, PP with phase transition pH of 5.5 will shrink and become hydrophobic around tumors (pH \approx 5.0) due to conformational transition of the chain. PP-DOX-AN with hydrophobic surface will then precipitate on cancer cells. The interspace between the polymer chains will increase after their shrinkage due to the low pH and the biodegradable AN will be degraded easily by proteinase. After degradation of AN, DOX will be released there to attack the cancer cells.



There are many more in the areas of recombinant protein expression by animal cell culture, tissue engineering and bioprocess optimization. Feel free to contact me (jingxiu.bi@adelaide.edu.au; +61-8-8303-4118) or drop in to my office (N212) if you want to have further discussion or other possible PhD projects.