

# “Antibody-targeted delivery of nanoparticles utilizing bispecific antibodies for applications in oncology”

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### **Abstract:**

Incorporating drugs such as small molecules, siRNA and proteins into nanoparticles seeks to achieve greater therapeutic efficacy and reduced systemic toxicity. However, despite extensive research into nanomedicine, there are a limited number of passively-targeted products approved for use including liposomal nanoparticles Myocet, Doxil, Daunoxome and Depocyt, Abraxane (albumin-based nanoparticle) and Genexol-PM (micelle). There are a number of barriers to successful nanoparticle-mediated drug delivery, including the reticular endothelial system, extravasation, crossing the anatomical and physical barriers between endothelial and tumour cells, penetrating the tumour structure, endocytosis uptake and intracellular release of therapeutic agents. Active targeting of nanoparticles using antibodies or peptides can improve nanoparticle delivery by enhancing uptake into targeted tumour cells. We are investigating strategies to empower nanoparticles with targeting capability through attachment of antibody fragments specific for tumour cell receptor targets such as epidermal growth factor receptor (EGFR) and other tumour-associated targets. The targeting of nanoparticles to various tumour types through the use of bispecific antibodies is described.

### **Bio:**

Professor Stephen Mahler is a Senior Group Leader at the Australian Institute for Bioengineering and Nanotechnology and Director of the Australian Research Council Training Centre for Biopharmaceutical Innovation (CBI), University of Queensland. Professor Mahler is a biotechnologist with a focus on R&D of recombinant-DNA derived protein biopharmaceuticals, drug delivery systems and nanomedicines. Professor Mahler has a record of translational research success and engages extensively with industry associated with the biomedical sciences both nationally and internationally.

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