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The Challenge of Protein Drugs

Recombinant DNA technology has been available to pharmacy since the beginning of the 1980s for the production of new drugs that are proteins. A substantial number of first-generation protein drug products is currently on the market including recombinant insulin, growth hormone, immunoglobulins, interferon, erythropoetin, etc. These biomolecules cannot be given by the oral route in the form of a classical tablet since they will be destroyed by the enzymes and acidity of the gastero-enteral tract. With some few exceptions these protein drugs are given parenterally, i.e. by injection, an uncomfortable and expensive technology. Much research has been dedicated to finding alternative, non-parenteral delivery techniques. In this talk I will discuss the potential use of needle-free injectors, specialized formulations claimed to deliver protein through the skin, the numerous attempts to achieve oral protein delivery, and the sad story of inhalable proteins. To conclude I will present some of our own work on single-droplet drying levitation to examine the formation of protein microparticles.

CV

Geoff Lee studied Pharmacy at Chelsea College in London and returned to take his PhD there in the field of emulsion science supervised by Tharwat Tadros. The next 6 years were spent in the US, first as a post-doc at the universities of Southern California in Los Angeles and North Carolina at Chapel Hill. Subsequently he was an assisant professor of pharmaceutics at Illinois University in Chicago. He was then appointed an asociate professor (C3) at Heidelberg University in Germany, before taking up the Chair of Pharmaceutics at Erlangen University, close to Nuremberg in south Germany. His research interests are focussed on: i) biologic microparticles; ii) inertiallycavitating nanostructures; and iii) thin polymer films and highly-tortuous synthetic membranes.