



## **Heretical Ideas and experiments in Polymer Chemistry?**

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### **Abstract:**

In this talk I will explore the importance of design and synthesis of polymers for pharmaceutical applications and particularly for drug delivery. For many years a quite restricted range of polymers have been applied to particular formulations, especially oral formulations. Increasingly drugs are being produced with a wider range of properties some of which are non-drug-like. To tackle the delivery of more hydrophobic drugs, biologically derived drugs and more challenging routes of delivery, a wider range of polymers, particularly biodegradable polymers with different properties may be required. I will briefly cover some of the polymers I have looked at over the years for various pharmaceutical applications, but focus mainly on my work over the last decade on a new class of polymers, the poly(glycerol adipates). These polymers are synthesised by a simple enzymic method using a lipase to generate a polymer with a pendant hydroxyl moiety in every co-monomer. The pendant hydroxyl group can then be functionalised to varying degrees with a wide range of different substituents. These different functionalities and degrees of substitution then offer a range of different physicochemical properties suitable for different types of formulations. One of the novel aspects of this polymer is its biological degradation route which offers further novel formulation opportunities. Over the lecture the synthesis, properties and possible applications of these polymers will be explored encompassing formulation, computational insights into drug polymer interactions and some biological areas of work involving these polymers.