

UniCat Special Lecture

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Lecturer: **Dr. Ipsita Roy**, School of Life Sciences, University of Westminster, London, UK

Title: **Polyhydroxyalkanoates, a family of Biodegradable Polymers**

Abstract: Polyhydroxyalkanoates (PHAs), are polyesters of 3-, 4- 5- and 6-hydroxyalkanoic acids, produced by a variety of bacterial species under nutrient-limiting conditions with excess carbon. These polymers are biodegradable and biocompatible in nature and hence can be used in a variety of applications including packaging, production of paints, agriculture, medicine and in biofuel production. Recently there has been considerable commercial interest in these polymers.

PHAs can be divided into two main groups, short chain length PHAs (scl-PHAs), with monomers containing C₃-C₅ carbon atoms and medium chain length PHAs (mcl-PHAs), with monomers containing C₆-C₁₄ carbon atoms. The scl-PHAs are generally hard and brittle in nature as opposed to the mcl-PHAs that are elastomeric in nature.

The talk will describe the production and characterisation of both scl and mcl-PHAs using *Bacillus cereus* SPV and *Pseudomonas mendocina* respectively, by growing them under different nutrient limiting conditions. *Bacillus cereus* SPV has been successfully used to produce poly(3-hydroxybutyrate), an scl-PHA, to an yield of about 60% dry cell weight. Similarly *Pseudomonas mendocina* has been successfully used for the production of poly(3-hydroxyoctanoate), a mcl-PHA with a maximum yield of about 40% dry cell weight. A brief description of the use of these polymers in medical applications will also be discussed.

Rai R., Keshavarz T. , Roether J. A., Boccaccini A. R., **Roy I.** 2010; "Medium chain length polyhydroxyalkanoates, promising new biomedical materials for the future." *Material Science Engineering (Reviews)* 73(3): 29-47

Philip, S. Keshavarz, T., **Roy I.** 2007 Polyhydroxyalkanoates: biodegradable polymers with a range of applications. *Journal of Chemical Technology and Biotechnology* 82 (3):233-247

Valappil S.P., Misra S.K., Boccaccini A.R., **Roy I.** 2006; "Biomedical applications of Polyhydroxyalkanoates (PHAs), an overview of animal testing and *in vivo* responses." *Expert Review in Medical Devices* 3(6): 853-868

Date: **Wednesday, September 28, 2011**

Time: **5:15 pm**

Location: **TU Berlin; Institute of Chemistry
Straße des 17. Juni 115; 10623 Berlin
Building C; Lecture Hall C 243**

Organiser: **Prof. Marga Lensen (TUB)**

Coffee and tea will be served thirty minutes prior to the lecture start.
Guests are cordially invited to attend!

Prof. Dr. Matthias Driess, Chair of the Cluster of Excellence UniCat