

Seminars in Biotechnology BTEC 591 & BTEC 691

“Synthetic Polymers for Bio-applications”

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13:30

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Murat Topuzoğulları graduated from Department of Chemistry at Yıldız Technical University in 2003. He completed his M.Sc. in 2006 under supervision of Prof. M. Mustafaev and Prof. H. Kuzu. In 2013, he received his Ph.D. under supervision of Prof. Sevil Dinçer and Prof. Volga Bulmuş. During his M.Sc. and Ph.D. studies, he worked on synthesis of polymers for drug/gene/antigen delivery. Between 2005 and 2017, he worked as research assistant in YTU Department of Bioengineering. Since 2017, he continues his studies as Assist. Prof. in the same department.

Murat Topuzoğulları's studies focus on synthesis of polymeric structures for biological applications, such as drug/gene/antigen delivery, antibacterial studies and tissue engineering. He is the author of 17. He is, now, principle investigator of a TÜBİTAK 1002 project and researcher in 2 TÜBİTAK 1001 projects and 1 TÜSEB project.

Abstract

With the discovery and better understanding of synthesis and structures of polymers, synthetic polymers have become indispensable materials of our life¹. A wide range of products, from construction to machinery industry or from optical products to textiles, are produced depending on the different properties of polymers. Biology and medicine are also one of the important application areas of polymers today. The implants, dental fillings, surgical threads or contact lenses used today are some of the medical products produced from polymers.

Polymers find place in many different medical applications as they enable the production of materials with diverse properties (hard, soft, conductive, soluble, biodegradable, etc.), as these polymers are cheaper to produce, modifiable, and can be produced by many different processes. Nowadays, more complex polymeric architectures can be produced as monodisperse with novel methods such as RAFT² or ATRP³ polymerization. Highly effective materials can be produced with these techniques and the structures of these materials can be related with their biological function to better understand the behavior of polymers in biological medium.

In this talk, the synthesis of soluble synthetic polymers, current techniques used in synthesis and the resulting polymeric structures will be mentioned. The activities of the produced structures as drug delivery systems⁴, gene transfer systems⁵, antigen delivery systems⁶ or antibacterial materials⁷ will be discussed and the audience will be informed about the use and importance of the synthetic polymers in biological applications.

References:

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