



ADVANCED MATERIALS AND NANOTECHNOLOGY

SEMINAR SERIES

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Next generation diabetes treatment by encapsulated insulin-producing cells

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Seminar room **S2.02, building S**
CEITEC Brno University of Technology
Purkynova 123

This contribution describes our work towards the diabetes treatment by transplantation of insulin-producing cells that are protected from the immune system by encapsulation in polymeric microcapsules. This principle is considered as the next generation treatment for diabetes, since it aims at a continuous glucose control in the absence of immunosuppression drugs. Polymeric microcapsules have to fulfill a number of specifications, such as the absence of fibrotic overgrowth, stability under in vivo environment, and free diffusion of glucose, insulin, oxygen, and vital nutrients, in order to provide the conditions for long-term viability and function of encapsulated islets.

We work on a multicomponent polyelectrolyte complex-based microcapsule that enables to tune the properties depending on the in vivo performance. This type of microcapsule is biotolerated after the intraperitoneal implantation into non-human primate animal model. Currently it has been further optimized for the pre-clinical studies within the project supported by the Encapsulation consortium of the Juvenile Diabetes Research Foundation.