

**Doctoral School of Information and Biomedical Technologies  
Polish Academy of Sciences (TIB PAN)**

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**SUBJECT:**

**Drug delivery systems using electrospun micro-and nanofibers.**

(the detailed title will be clarified as a result of the Ph.D. student-promoter interaction)

**SUPERVISOR:**

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**DESCRIPTION:**

The “classic” ways of administering drugs have many disadvantages, e.g., fluctuations in the drug concentration over time or complications caused by not taking medication or overdose. Another critical issue is the drug’s influence on the entire body and not on the tissue or organ where the drug is necessary, therefore using its significant excess. Drug delivery systems try to solve these problems. So far, they are only applicable to powerful drugs, e.g., hormonal drugs, delivered for up to several months. Systems such as “Lupron Depot” are based on intramuscularly injected microspheres. Such microspheres, when present in the bloodstream, would cause a cerebral or pulmonary embolism. Using drugs trapped in the nanofiber network can solve such problems. Drugs will be released similarly to the “Depot” systems for up to several months, yet free from the drawbacks associated with the presence of microspheres. The project will aim to develop a novel Drug Delivery System and test its effectiveness on model drug-like substances, such as fluorescent dyes and proteins conjugated with fluorescent dyes. It will also be possible to test the release of the actual drug.

**BIBLIOGRAPHY:**

Yarin, A.L.; Pourdeyhimi, B.; Ramakrishna, S. *Fundamentals and applications of micro and nanofibers*; Cambridge University Press, 2013; Vol. 9781107060; ISBN 9781107446830.