

**DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
MENDEL UNIVERSITY IN BRNO (MENDELU)**

- 100 employees
- More than 750 m² of laboratories
- World-class instrumentation
- Part of the Central European Institute of Technology (CEITEC)

Research and development of advanced materials and approaches in physiology, biology, biochemistry and chemistry are the main vision of the abovementioned team. There are several laboratories dedicated to key areas such as bioanalytical chemistry, experimental microbial and animal biochemistry and biology, and, last but not least, algae and plant biotechnology and their utilization in agriculture, environment, functional food and plant protection. The instrumental equipment available enables the researchers to participate in a large number of grant projects at all levels – internal, national and international. Recent and current ongoing projects awarded by European Commission include:

- 2018-2022: ERC-2017-STG, “ToMeTuM”
- 2017-2020: H2020-GALILEO-GSA-2017, “GreenPatrol”
- 2017-2018: H2020-WIDESPREAD-04-2017-TeamingPhase1, Back4Future
- 2015-2017: H2020-JTI-IMI2-2014-02-single, “FILODIAG”
- 2009-2013: MAS, Nanoelectronics for mobile AAL-Systems, 7 FP ENIAC

Laboratory of cancer biology and nanomedicine:

Laboratory explores the use of nanomaterials in medicine, especially elemental particles as potential antimicrobials. Experimentally, the laboratory focuses on *in vitro* and *in vivo* experiments.

Project idea:

Use of advanced nanomaterials for ensuring sterility and antimicrobiality of cover materials in agricultural practice

Partnership/cooperation possibilities:

The fundamental research intent will be the development, characterization and modification of nanomaterials based on selenium and other metals and semi-metals having wide-spectrum antimicrobial effects on the one hand, but no or only minor cytotoxic effect on eukaryotic cells on the other. The prepared nanoparticles will be further modified to increase the effects or to prevent negative effects by targeting ligands that will be tailored to the particular application. In addition to the nanoparticles itself, the procedures for their targeted transport or gradual disintegration will be designed in order to operate at the particular destination or for particular time. Nanoparticles designed in this way will be then further applied in the research intent in the field of veterinary medicine, which will be the treatment of surface bacterial infections in livestock. Targeting the most suitable composite in terms of its antimicrobial properties will be in particular for the complicated treatment of infections caused by resistant strains of bacteria, whereby the composite will be attached physically or chemically to the surface of the cover bandage material to ensure its sterility. Such modified bandage materials, with minimal manufacturing costs, will represent a whole new and unique way to prevent inflammation of wounds or treatment of wounds hard to heal.

Possible H2020 call:

SFS-11-2019

Anti-microbials and animal production

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