

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

- 72 employees
- More than 350 m² of laboratories
- World-class instrumentation
- Part of the Central European Institute of Technology (CEITEC)

Laboratory of cancer biology and nanomedicine:

One of the research directions of the laboratory is the study of mechanisms involved in tumor processes, with a particular attention to the prostate tumors. Laboratory also explores the use of nanomaterials in medicine, especially protein cages in antitumor therapy. Experimentally, the laboratory is focused on *in vitro* work with both malignant and non-malignant cell lines.

Project idea:

Nanobiotechnologies based on nanoparticles supported by protein cages with catalytic and enzyme-mimetic activity

Partnership/cooperation possibilities:

Ferritin nanocages provide unique nanoreactor environment for the production of biocompatible metallic nanoparticles (NPs). Under certain conditions, the metallic particles remain attached to the protein surface, and thus stabilized, permitting better access to the substrate for catalytic activity. Alternatively, nanoparticles can be produced inside the ferritins cavity. MENDELU is producing various types of stable ferritin-nanoparticles complexes (Pt, Rh, Pd, Ir, Au, Ag, etc.), which have exceptional specific catalytic activity in reduction of diazo- dyes (4-nitrophenol, methyl orange, Congo red), and which could have a broad spectrum of applicability in various fields of research, including catalytic inactivation of xenobiotic, use in green industrial chemical synthesis or in bioorthogonal nanomedicine, where inactive compounds are catalytically activated in the desired tissue using actively-targeted enzyme-mimetic nanoparticles. MENDELU offers molecular biology methods and small-to-medium scale protein production and purification facility together with NPs synthesis and characterization. MENDELU is looking for partners with capability to test its nanobiotechnologies in their applications (incl. remediation or nanomedicine). MENDELU is also capable of providing pre-clinical *in vitro* toxicity screenings and other types of *in vitro* methods for biological characterization or estimation of biocompatibility.

Possible H2020 2018 calls:

SC1-BHC-09-2018 Innovation platforms for advanced therapies of the future
BIOTEC-04-2018 New biotechnologies for environmental remediation

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