Jožef Stefan Institute, Advanced Materials Department
Ljubljana, Slovenia

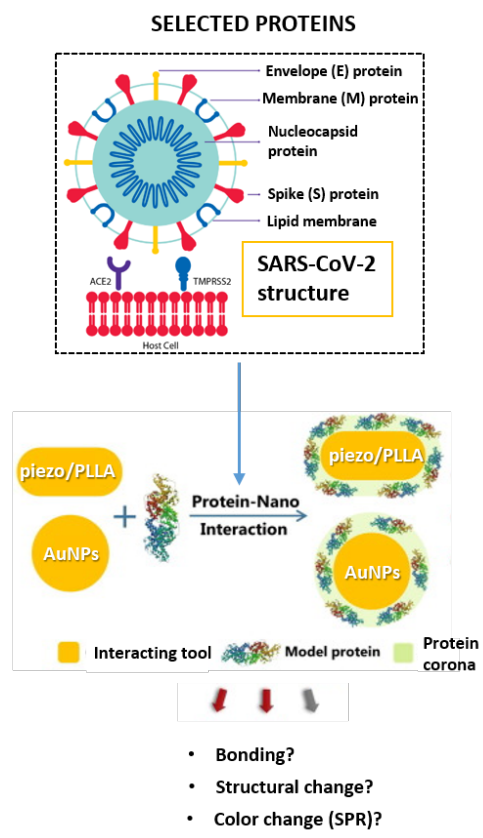
1 Postdoctoral/Research Associate Position – Functionalized Nanostructures for Microbial Detection and Antiviral Activity

Within the extension of the Slovenian national research programme »Contemporary inorganic materials and nanotechnologies« dedicated to COVID-19 research a postdoctoral position is immediately available at Advanced Materials Department of Jožef Stefan Institute, Slovenia.

The aim of the research is to integrate very simple and economic, but accurate and fast detection tools able to show visible change of colour in case of contamination with microbes (bacteria or viruses). While nano-gold detects down to 50 virus particles in 5 minutes, detection limit of Presto blue is 10 colony forming units (cfu) in 15 minutes. For the very first time we will assemble nano-gold and PrestoBlue indicators inside charged, electro-active polymer to form innovative protective layer with antivirus, antibacterial and microbial-detection capacities applicable for novel safe and durable design of medical face masks. Biodegradable, piezoelectric poly-lactide (PLLA) will be formed as matrix layer that carry detection tools. Mechanical deformation of piezo-PLLA during breathing will produce charged electro-active surface, able to destabilize virus particles and bacterial cells providing antimicrobial activity. We will particularly focus our research on investigating interactions between charged surface of piezo-PLLA and nano-gold with structural proteins from the surface of SARS-CoV-2 virus. Biodegradable, antimicrobial textile with integrated components for detecting contamination at the surface is part of the innovative design of face masks for the future.

The open position is related to:

1 Designing bacterial and virus detections tools (functionalized nano-gold and Presto blue);
2 Developing antimicrobial tools (piezoelectric PLLA fibres and films);
3 Integrating detection and antimicrobial tools into nanostructured films;
4 Performing physicochemical characterization, antimicrobial tests and investigating interactions with selected proteins from SARS-CoV-2 virus.



Requirements:

- PhD degree in biochemistry, biophysics, physical chemistry, material science or related fields,
- A very good knowledge of English language,
- Creative, motivated candidate should be able to work independently, as well as in a collaborative environment.

Candidates from all countries are invited to submit their applications. The position is available for one year with possibility to be extended. The salary is according to Slovenian Research Agency regulations.

For additional information please contact Ddr Marija Vukomanovic, Advanced Materials Department, Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia (marija.vukomanovic@ijs.si, tel.: +386 1 477 3547) or visit http://www-k9.ijs.si/research/novel-antimicrobial-nanotechnologies).

Each applicant should send to the above mentioned e-mail address:

- A covering letter describing the applicant's research motivation,
- A CV with detailed description of candidate's education and professional career,
- Bibliography list,
- At least three references.

Please submit your application before October 28, 2020.