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EMPHASIS RESEARCH CENTRE

Πανεπιστήμιο Κύπρου
University of Cyprus

EMPHASIS NEWS

NEWS AND ANNOUNCEMENTS:

1

NEW PUBLICATION: Measurements of Local Sources of Particulates with a Portable Monitor along the Coast of an Insular City

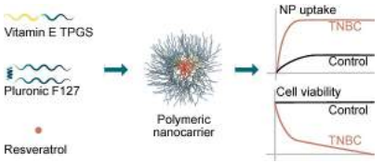
The study, published in the journal Sustainability, addresses the fact that air quality of modern cities is considered an important factor for the quality of life of humans and therefore is being safeguarded by various international organizations. A series of anthropogenic and natural events taking place on the coastal front of a dynamic developed insular city were selected and monitored for their air particulate matter contribution. The violations of the limits that were noticed were attributed mainly to the various anthropogenic activities taking place on-site, revealing once more the need for further research and continuous monitoring of air quality.
The authors of this study are Dr. Agapios Agapiou and Dr. Marinos Stylianou, from the Department of Chemistry from UCY, and C. Petsas and Dr. Antonis Zorpas from the Open Univ. of CY.

CLICK HERE FOR MORE

2

NEW PUBLICATION: Nanoparticles deliver wine compound to destroy cancer cells

The new study, published in the journal Nanotheranostics, describes the development and use of a new nanoparticle that can help in imaging and therapy of aggressive breast cancer using natural substances.
Dr.Yiota Gregoriou, working together with Dr. Chrysafis Andreou, was the lead scientist of this multidisciplinary project encompassing teams from engineering, biology, and the medical school from UCY and CUT.
The nanoparticles were shown to be a successful way to deliver natural compounds to aggressive tumor cells. Specifically the compound Resveratrol, found in the skin of grapes, was used to destroy cancer cells without harming healthy tissues.



CLICK HERE FOR MORE

FEATURED LAB:

Molecules in our environment and body affect our health and wellbeing. Our technologies make these molecules visible, and shed light on disease on a personalized level.

Molecules in our environment and in our body affect our health and our wellbeing. However, these molecules are too small to see. Our mission is to make sensors for molecular markers of disease, in the quest to provide smart, preventative, and personalized medicine. Our main research directions are in the development of chemical assays for analysis of biosamples and in the molecular imaging of cancer. We develop technologies that help us form a bridge from the nanoscale to the scale of human senses. In this way, we can reveal molecules related to disease, so to inform diagnosis and provide treatment recommendation. Our technologies include microdevices, nanoparticles, computer algorithms, and biological models.

Chrysafis Andreou, Ph.D.
Director Nanotechnology, Imaging & Detection Laboratory

N I D L
Nanotechnology, Imaging & Detection Laboratory

SPECIALIZES IN:
- Nanomedicine
- Molecular Imaging
- Microfluidic Assays

INCLUDES:
- 3 postdocs
- 2 grad students
- 7 undergrads

IS A MEMBER OF:
University of Cyprus Department of Electrical and Computer Engineering
EMPHASIS RESEARCH CENTRE

WORKS WITH:
University of Cyprus Medical School
University of Cyprus Faculty of Pure and Applied Sciences
CCRI Cyprus Cancer Research Institute
The Cyprus Institute of Neurology & Genetics

N I D L
Nanotechnology, Imaging & Detection Laboratory

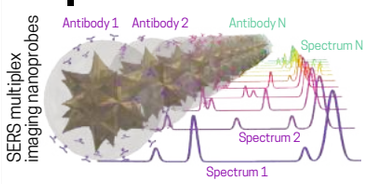
OUR PHILOSOPHY

FOUR POWERFUL TECHNOLOGIES

NANOPARTICLES

Nanoparticles can reveal the presence of specific molecules, in biofluids or inside the body. Our nanoparticles use optical detection methods, specifically surface enhanced Raman spectroscopy (SERS) and fluorescence.

SERS



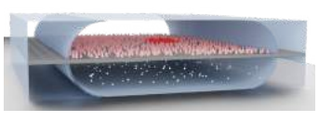
Fluorescence

MICROFLUIDIC DEVICES

Microfluidic devices shrink the lab onto a chip. Our devices miniaturize routine lab analysis to build automatic, faster, and cheaper assays. More complex architectures mimic biological tissues, organs, and cancerous tumors.

Biofluid analysis

Organs on chip

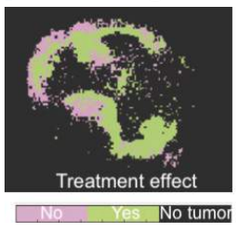


NUMERICAL METHODS

Numerical simulations help optimize the geometry of our nano- and micro-systems at the beginning of a project, and machine-learning algorithms help us interpret the results in the end.

Simulations

Machine learning



BIOLOGICAL MODELS

Our methodologies can be applied on biopsies, to better understand an individual tumor, or on animal models, to reveal the biological mechanisms of disease.

Biopsy profiling

Model animal imaging

ONE SINGULAR GOAL:

PERSONALIZED MEDICINE

FEATURED PROJECT:

SERS-4-SARS:

Surface Enhanced Raman Scattering Nanoprobe Assay for Multiplexed Recent and Past SARS-CoV-2 Infection

ABOUT:

Monitoring the status of antibodies in the community is crucial in the fight against the coronavirus pandemic. We are developing a new test, based on nanoparticles and Surface Enhanced Raman Spectroscopy, to detect antibodies against SARS-CoV-2. The project has received funding from the Cyprus Research and Innovation Foundation.

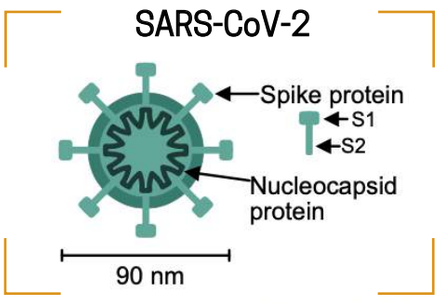
SERS-4-SARS

Funded by: Cyprus Research and Innovation Foundation

Duration: Sep 2020 - March 2021

Type: Concept-Covid

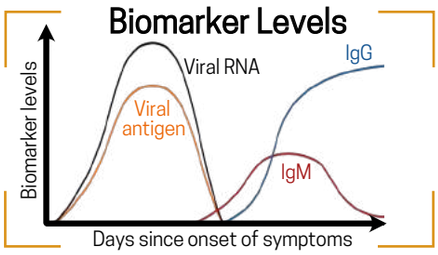
Collaboration with: Dr. Katerina Strati (Department of Biology)

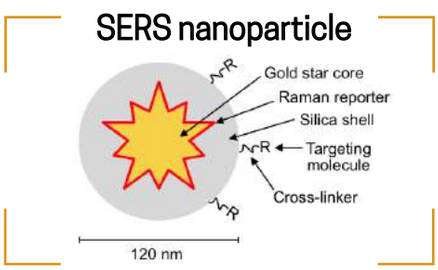


SARS-CoV-2 is the viral agent that causes the disease COVID-19. The virus is composed mainly by two proteins: the "Nucleocapsid" protein which encloses its genetic material (RNA) and the "Spike" protein which gives the virus its characteristic "corona".

The virus attaches to cells using the "Spike" protein. Once bound to the cell, it releases its RNA into the cell infecting it. The infected cell then produces new copies of the virus.

Antibodies are one form of the body's defenses. Once a foreign object (like the virus) is identified, the body produces antibodies to neutralize it. Antibodies are produced in different forms and against many targets – including the Nucleocapsid and Spike proteins. IgM antibodies are produced quickly, and signify recent infection. IgG antibodies are produced later, and help maintain future immunity against reinfection.





Our nanoparticles are composed of a gold core and a glass shell. When excited by laser light, they provide a very strong optical signal that allows us to detect them with great sensitivity. The signal is based on the effect called surface enhanced Raman scattering (SERS). By attaching antigens on the nanoparticles we can use their signal to detect the presence of antibodies against the virus in a biosample like saliva.

We hope that our project will help monitor effective immunity for individuals, and for the community as a whole.

FOR MORE INFORMATION PLEASE VISIT OUR WEBSITE

CLICK HERE

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