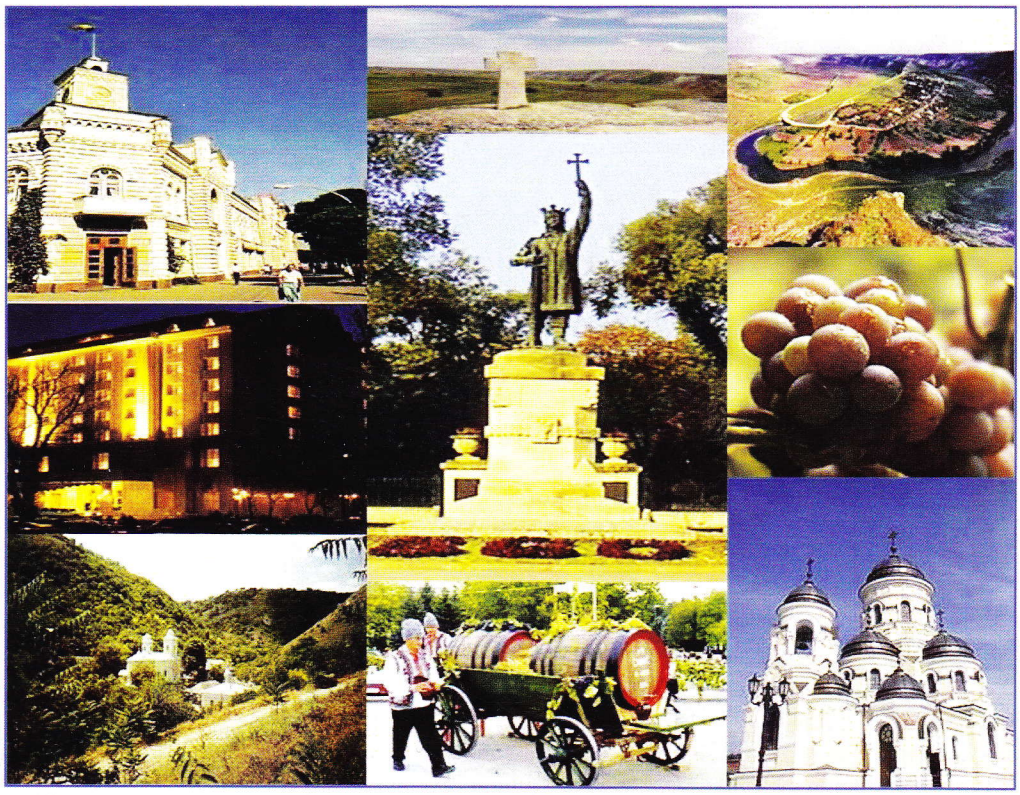
NATO OTAN

This activity is supported by: The NATO Science for Peace and Security Programme

Norwich University Applied Research Institutes
1819
NUARI

Technological Innovations in Detection and Sensing of Chemical Biological Radiological Nuclear (CBRN) Threats and Ecological Terrorism

Chisinau, Moldova
June 7-17, 2010



Editor: Ashok Vaseashta (USA)
Co-Editors: Nicolae Enache (MD), Emir Denkbas (TR), Stella North (USA), Doga Kavaz (TR), Marina Turcan (MD), Nellu Ciobanu (MD)

Copyright Information and Disclaimer

Sponsors

- North Atlantic Treaty Organization (NATO)
- National Science Foundation (NSF)
- Norwich University Applied Research Institutes (NUARI)
- Vaseashta Family Foundation
- City of Chisinau, Moldova
- "Milestii Mici" and "Bostovan" wine companies

Library of Congress Classification

1. Engineering Materials	621.3
2. Biomaterials	610.28
3. Biotechnology	620.8
4. Medicine	610
5. Materials Sciences	620.112
6. Molecular Electronics	621.381
7. Quantum Electronics	537.5

Committees

International Organizing Committee

Prof. Arzum Erdem, Turkey
Dr. Jasna E. Stikova, Macedonia
Dr. Miroslava Vaclavikova, Slovakia
Prof. Dr. Emir Denkbas, Turkey
Prof. Nicolae Enache, Moldova
Prof. Acad. Alexander Petrov, Bulgaria
Prof. Dr. Ashok Vaseashta, USA

Local Organizing Committee

Tamer Çırak, Turkey
Doga Kavaz, Turkey
Dr. Stella North, USA
Nellu Ciobanu, Moldova
Tudor Rosca, Moldova
Marian Turcan, Moldova
Ms. Tatiana Buza, Moldova
Prof. Nicolae Enache, Moldova
Prof. Dr. Ashok Vaseashta, USA

Abstract Committee

Marian Turcan, Moldova
Doga Kavaz, Turkey
Dr. Stella North, USA
Prof. Emir Denkbas, Turkey
Prof. Nicolae Enaki, Moldova
Prof. Dr. Ashok Vaseashta, USA

Co-Directors

Prof. Dr. Ir. Ashok K. Vaseashta
Institute for Advanced Sciences Convergence
International Clean Water Institute
NUARI, 13873 Park Center Road, Suite 500
Herndon, VA 20171, USA
Email: prof.vaseashta@nanoknowledge.info
FAX: +1 877 615 3775

Prof. Nicolae Enache
Quantum Optics laboratory
Academy of Sciences of Moldova,
Institute of Applied Physics
Academiei str. 5, Chsinau, Moldova
Email: enache@asm.md
FAX: +373 22 738149

FUNCTIONALIZED INORGANIC SILICA NANOPARTICLES AS THE NANO LORRY FOR VIRUS LIKE PARTICLES

Y. Dekhtyar[1], A. Kachanovska[1], A. Patmalnieks[2], P. Pumpen[3], R. Renhofa[3], M. Romanova[1], D. Skrastiņa[3]
[1]Biomedical Engineering and Nanotechnology Institute, Riga Technical University, Riga, LATVIA
[2]Institute of Microbiology and Biotechnology, University of Latvia, Riga, LATVIA
[3]Biomedical Research and Study Centre, Riga, LATVIA

ABSTRACT: Immunomodulation is a new kind of viral infection treatment where molecular agents that are injected inside a human organism stimulate immune system to respond effectively to a viral infection. It is important to deliver immune response-modulating agents (IMA) exactly to target cells. A concentration of IMA in the vicinity of the cell should be high in contract with the rest organism. Such the approach reduces side effects that are possibly induced due to IMA. The virus like particles (VLP) are used to transport IMA. In order to deliver high concentration of VLP to the cell they could be attached to the nanoparticle that will be in use as a nanolorry for the drug delivery system.

SiO_2 nanoparticles were explored to attach Hepatitis B VLP. Spectrophotometry measurements, electron and fluorescent microscopy evidenced that the SiO_2 - Hepatitis B VLP complexes were formed. Vaccination of animals with the complexes demonstrated twelve-time increase in antibody production.

The results confirmed eligibility of SiO_2 nanoparticles to become the nanolorries for VLP.

Keywords: silica nanoparticles, immunomodulation, virus like particles, drug delivery