



ABSTRACT BOOK

International research
and practice conference:

**NANOTECHNOLOGY
AND NANOMATERIALS
(NANO-2022)**

25-27 August 2022
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This book contains the abstracts of contributions presented at the International research and practice conference “Nanotechnology and Nanomaterials” (NANO-2022).

The NANO-2022 Conference was organized by the Institute of Physics of NAS of Ukraine with the participation of the University of Tartu (Estonia), the Lviv Polytechnic National University, University of Turin (Italy) and Pierre and Marie Curie University – Paris 6 (France).

NANO-2021 was the ninth conference in the series of NANO-conferences initiated by the Institute of Physics of NAS of Ukraine in 2012 in the framework of FP7 Nanotwinning project. From year to year, they attract more attention and participants. In 2012, the first meeting was held in the format of International Summer School for young scientists «Nanotechnology: from fundamental research to innovations». The 2013 and 2014 conferences were organized in conjunction with the International Summer Schools for young scientists under the same title. In 2013, this event was attended by more than 300 scientists, in 2014-2017, 450 scientists took part and in 2018 it gathered above 650 participants. In 2021 conference was attended by more than 700 scientists from Ukraine, Poland, Italy, Estonia, France, Austria, Germany, Greece, Turkey, USA, Romania, Moldova, Czech Republic, Taiwan, Lithuania, Egypt, Iran, India, Algeria, Indonesia and other countries. In 2021 the Organizer Committee has received more than 800 application forms from about 25 countries of the world.

The NANO-2022 conference brought together leading scientists and young researchers from many countries of the world. This year its topics were as follows: Nanobiotechnology for health-care; Nanochemistry and biotechnology; Nanocomposites and nanomaterials; Nanoobjects microscopy; Nanooptics and photonics; Nanoplasmonics and surface enhanced spectroscopy; Nanoscale physics; Nanostructured surfaces; Physico-chemical nanomaterials science.

Website of the Nano-2022 conference: <http://nano-conference.iop.kiev.ua>

In order to support the formation of the communications between the scientific and innovation communities the EEN-Ukraine consortium together with EEN partners in Germany organized STARTUP2022 competition for selection 10 the best Ukrainian startups for participation in the Start-up BW Summit, Germany.

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Electrophoretic studies of proteins of erythrocytes membrane under influence of silver nanoparticles

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The application of silver nanoparticles (AgNPs) for treatments against different diseases is increasingly innovative and effective [1]. The venous blood erythrocytes of 20 patients with lung cancer and 20 healthy donors were used as the object of the study. The control group consisted of 20 practically healthy donors of the same age. The effect of AgNP preparations (diameter $d \sim 35$ nm) on RBCs membranes in a physiological solution containing $65.25 \cdot 10^6$ cells per 1 ml of the reaction mixture was analyzed. Membranes of erythrocytes were obtained by the method of J. Dodge [2]. Isolation and separation of the membrane proteins of erythrocytes by one-dimensional disc-electrophoresis in a 10% polyacrylamide gel containing 1% sodium dodecyl sulfate was carried out according to the well-known Laemmli method [3]. The resulting gels were scanned on a densitometer. Calculations of the percentage content of individual protein fractions (before and after its introduction of AgNP preparations in suspension in vitro) were performed based on the analysis of densitograms. Statistical processing was carried out using the t-criteria Students. Comparative analysis of the protein spectrum of erythrocyte membranes of blood of patients with cancer before and after AgNP preparations added revealed significant changes in the content of spectrin, ankyrin, and bands of proteins 2 and 3; in proteins of band of fractions 4.1, 4.2 and 4.9, protein of band 6 and protein of band 8.

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