

7th International Conference
NANOBIOPHYSICS: Fundamental and Applied Aspects
N B P - 2021

CONFERENCE PROGRAM

4 OCTOBER, MONDAY

8.30-10.00

Registration

10.00-10.10

OPENING OF THE CONFERENCE

CONFERENCE HALL

**Nanobiohybrids formed by 1-D or 2-D nanomaterials
with bioobjects**

Chair

Prof. Karachevtsev V.A.

10.10-10.40

**GRAPHENE-LIKE NANOSTRUCTURES AS A
PLATFORM FOR STUDYING BIOLOGICAL
MACROMOLECULES AND CELLS: FTIR, RAMAN,
CARS, FLUORESCENT SPECTROSCOPY AND
MICROSCOPY DATA**

**Dovbeshko G.I., Gnatyuk O.P., Afonina U.K., Dementiev A.,
Karachim S.O., Belevskii P.A., Morozovska A.N.**

L1

10.40-11.10

**COMPLEXES OF 2D NANOMATERIALS WITH
BIOMOLECULES: QUNTUM-MECHANICAL INSIGHT**
Stepanian S.G.

L2

11.10-11.30

**MOLYBDENUM DISULFIDE EXFOLIATED WITH
NUCLEOTIDES: SPECTROSCOPY AND AFM
CHARACTERIZATION**

**Kurnosov N.V., Voloshin I.M., Lytvyn O.S.,
Karachevtsev V.A.**

O1

11.30-11.35

General Conference Photo

11.35-12.10

Coffee break

CONFERENCE HALL Nanobiohybrids formed by 1-D or 2-D nanomaterials with bioobjects		
Chair	Prof. Dovbeshko G.I.	
12.10-12.40	SINGLE- AND DOUBLE-STRANDED POLYNUCLEOTIDES ON GRAPHENE/GRAPHENE OXIDE: STRUCTURES AND BINDING ENERGIES Karachevtsev V.A., Karachevtsev M.V.	L3
12.40-13.00	THE PYRIMIDINE NUCLEOSIDES (THYMIDINE) IN AN Ar MATRICES AND CONDENSED FILM WITH GRAPHENE OXIDE: EXPERIMENTAL FTIR SPECTRA AND AB INITIO CALCULATIONS Ivanov A.Yu., Stepanian S.G., Karachevtsev V.A.	O2
13.00-13.20	SPECTROSCOPIC STUDIES OF PORPHYRIN FUNCTIONALIZED ALIGNED SWNT:DNA NANOHYBRIDS ENCAPSULATED IN STRETCHED GELATIN FILMS Glamazda A.Yu., Plokhotnichenko A.M., Leontiev V.S., Karachevtsev V.A.	O3
13.20-14.30	Time for Lunch	
CONFERENCE HALL Theoretical calculations and computer modeling of nanobiosystems		
Chair	Dr. Stepanian S.G.	
14.30-15.00	ON POSSIBLE ROLE OF HYDROGEN PEROXIDE MOLECULES IN ION BEAM THERAPY OF CANCER CELLS Volkov S.N.	L4
15.00-15.20	INFLUENCE OF FLEXIBLE SURFACE OF GRAPHENE ON RNA DUPLEX ADSORPTION: MOLECULAR DYNAMICS SIMULATION Karachevtsev M.V.	O4
15.20-15.50	Coffee break	

15.50-16.10	MECHANISMS OF SPERMIDINE³⁺ INTERACTIONS WITH THE DNA DOUBLE HELIX AT THE NANOSCALE Mocci F., Laaksonen A., Engelbrecht L., Vasiliu T., Perepelytsya S.	O5
16.10-16.30	PONDEROMOTIVE FORCES IN THE SYSTEM OF TWO SOLID NANOPARTICLES: APPLICATION TO BIOSYSTEMS Rusinchuk N.M., Lozovski V.Z., Lysenko V.V., Mukha Yu.P., Vityuk N.V., Bilyavska L.O., Nyumenko K.S., Zahorodnya S.D.	O6
16.30-16.50	DOMAIN'S STRUCTURE OF BENZENE ADSORBED ON GRAPHENE Lykah V.A., Syrkin E.S.	O7
17.00	<i>Welcome Party</i>	
5 OCTOBER, TUESDAY		
CONFERENCE HALL Physical aspects of biomolecular nanosystems		
<i>Chair</i>	<i>Dr. Vashchenko O.V.</i>	
9.30-10.00	AMYLOID FIBRILS AS A SCAFFOLD FOR MULTISTEP ENERGY TRANSFER Trusova V.M., Tarabara U.K., Zhitniakivska O.A., Vus K.A., Gorbenko G.P.	L5
10.00-10.30	ROS-REGULATING NANOMATERIALS. BIOMEDICAL APPLICATIONS Yefimova S.L., Maksimchuk P.O., Seminko V.V., Bespalova I.I.	L6
10.30-11.00	BIONANOPHOTONIC APPROACH TO SOME MODERN HEALTH CHALLENGES Yashchuk V.M., Losytskyy M.Y., Degoda V.Y., Buchatsky L.P., Rud Y.P., Kravchenko V.M., Shishko E.D., Shton I.O., Chepurna O.M., Vretik L.O., Nikolaeva O.A., Ohulchanskyy T.Y.	L7

11.00-11.30		<i>Coffee break</i>
CONFERENCE HALL		Physical aspects of biomolecular nanosystems
<i>Chair</i>	<i>Prof. Yefimova S.L.</i>	
11.30-12.00	BLOCKING THE BINDING OF THE SARS-CoV-2 CORONAVIRUS TO THE ACE2 CELL RECEPTOR: RESULTS OF MOLECULAR MODELING Miroshnychenko K.V., Shestopalova A.V.	L8
12.00-12.30	MASS SPECTROMETRIC SIMULATION OF NANOCLUSTERS RELATED TO CHEMICAL EVOLUTION IN SPACE Kosevich M.V., Boryak O.A., Shelkovsky V.S.	L9
12.30-13.00	MOLECULAR ASPECTS OF RECYLIZATION OF N-SUBSTITUTED 2-IMINOCOUMARINES Kovalenko S.M., Vashchenko O.V., Trostianko P.V., Sviechnikova L.V., Lisetski L.N.	L10
13.00-14.00		<i>Time for Lunch</i>
CONFERENCE HALL		Biomolecules on nanoparticles and nanostructured surfaces
<i>Chair</i>	<i>Prof. Yashchuk V.M.</i>	
14.00-14.30	FEATURES OF THE “AMPHI-PIC J-AGGREGATE – BOVINE SERUM ALBUMIN” COMPLEXES Sorokin A.V., Grankina I.I., Averchenko K.A., Borovoy I.A., Yefimova S.L.	L11
14.30-14.50	MASS SPECTROMETRIC MARKERS OF MODULATION EFFECTS ON MOLECULAR LEVEL UNDER DRUGS CO-ADMINISTERING: DEVELOPMENT OF MASS SPECTROMETRY APPROACH TO NANOBIOCOMPLEXES STUDY Pashynska V.A.	O8

14.50-15.10	<i>Coffee break</i>	
15.10-15.40	CONDENSATION OF ATOMIC CARBON: ROUTE TO PROTEINS IN SPACE Krasnokutski S.A., Chuang K.-J., Jäger C., Ueberschaar N., Henning T.	L12
15.40-16.10	PHOTONIC CRYSTALS AS A PLATFORM FOR IMAGING OF BIOMOLECULES Boiko V., Gnatyuk O., Hanulia T., Dovbeshko G.	O9
16.10-16.30	MECHANISM OF REACTIVE OXYGEN SPECIES SCAVENGING BY GdYVO₄:Eu³⁺ NANOPARTICLES Hubenko K.O., Yefimova S.L., Maksimchuk P.O., Seminko V.V.	O10
CONFERENCE HALL SPIE & OSA WORKSHOP Career development opportunities for scientist and students		
16.30-17.30	INTRODUCTION TO OSA (THE OPTICAL SOCIETY) AND SPIE (THE INTERNATIONAL SOCIETY OF OPTICS AND PHOTONICS) Mysko-Krutik N., Herus A., Kravchuk O., Shchuka M.	
17.00-18.00	Poster Session 1	P1-P26
6 OCTOBER, WEDNESDAY		
CONFERENCE HALL Applied aspects of nanobiophysics		
<i>Chair</i>	<i>Dr. Pashynska V.A.</i>	
9.30-10.00	POINT-CONTACT SENSORS AS AN ADVANCED TOOL FOR REAL-TIME ANALYSIS OF MOLECULAR SYSTEMS Kamarchuk G.V., Pospelov A.P., Harbuz D.O., Savytskyi A.V., Herus A.O. Belan V.I., Gudimenko V.A., Vakula V.L., Kamarchuk L.V.	L13

10.00-10.30	MULTICOMPONENT NANOSYSTEMS FOR ANTICANCER THERAPY: RECENT ADVANCES AND DISADVANTAGES Kutsevol N.V., Lukianova N.Yu., Yeshchenko O.A.	L14
10.30-11.00	STUDY OF ZINC TETRAPHENYLPORPHYRIN / DEXTRAN GRAFT POLYACRYLAMIDE COPOLYMER / AU NANOPARTICLES NANOSYSTEM APPLICABILITY FOR PHOTODYNAMIC THERAPY Yeshchenko O.A., Kutsevol N.V., Tomchuk A.V., Khort P.S., Virych P.A., Chumachenko V.A., Kuziv Y.I., Naumenko A.P., Marinin A.I.	L15
11.00-11.20	<i>Coffee break</i>	
<i>Chair</i>	<i>Prof. Kutsevol N.V.</i>	
11.20-11.50	APPLICATION OF SPHERICAL VIRUS-LIKE PARTICLES FOR NANOBIO TECHNOLOGY Buchatskyi L.P., Rud Yu.P., Zaloilo O.V., Yashchuk V.M.	O11
11.50-12.10	HYDROGEL-SILVER NANOPARTICLE COMPOSITES FOR ANTIBACTERIAL PHOTODYNAMIC THERAPY Nadtoka O.M., Virych P.A., Krysa V.M., Kutsevol N.V.	O12
12.10-12.30	NEW HYBRID STRUCTURES BASED ON OXYGEN-FREE GRAPHENE AND ALUMINUM PHTHALOCYANINE CHLORIDE FOR PHOTODYNAMIC THERAPY Klimenko I.V., Lobanov A.V., Trusova E.A.	O13
12.30-12.50	EFFECTS OF GdYVO₄:Eu³⁺ NANOPARTICLES ON THE METABOLIC ACTIVITY OF SPLENOCYTES AND BONE MARROW CELLS Onishchenko A.I., Prokopiuk V.Yu., Yefimova S.L., Klochkov V.K., Tkachenko A.S.	O14
12.50-13.10	DYNAMIC CONTROL OF ENZYMATIC REACTIONS USING MICROWAVE DIELECTROMETRY METHOD FOR BIOMEDICAL APPLICATIONS Kuznetsova K.S., Pashynska V.A., Eremenko Z.E., Martynov A.V.	O15

13.10-14.00		<i>Time for Lunch</i>
CONFERENCE HALL		A Special Session of the Ukrainian Biophysical Society
<i>Chair</i>	<i>Dr. Kosevich M.V.</i>	
14.00-14.10	Welcome greetings of the Ukrainian Biophysical Society	
14.10-14.30	NANOSTRUCTURED CARBON MATERIALS AS NOVEL MODULATORS OF DIVERSE TYPES OF ION CHANNELS Dryn D.O., Melnyk M.I., Ivanova I.V., Hurmach V.V., Platonov M., Ritter U., Soloviev A.I., Prylutsky Yu.I., Zholos A.V.	O16
14.30-14.50	ADSORPTION OF GRAMICIDIN S ON NANO-SIZED LIPOSOMES CAN MITIGATE SEVERE SIDE EFFECTS OF ANTIMICROBIAL PEPTIDE Berest V.P., Sichevska L.V., Gorobchenko O.O.	O17
14.50-15.10	NONTRADITIONAL NANO-OPENERS OF LARGE- CONDUCTANCE Ca-ACTIVATED K CHANNELS Soloviev A.I.	O18
15.10-15.40	PHYSICOCHEMICAL DETERMINANTS OF VIRUS- CELL INTERACTION Zholobak N.M.	L16
15.40-16.00	General discussion of UBPS current problems	
16.00-16.20		<i>Coffee break</i>
16.20-17.50	Poster Session 2	P27- P52
18.00		<i>Social Event</i>

7 OCTOBER, THURSDAY

CONFERENCE HALL

Applied aspects of nanobiophysics

Chair Dr. Glamazda A.Yu.

9.30-9.50	PREPARATION OF COLLOIDAL AQUEOUS SOLUTION OF C60 FULLERENE BY THE SUBLIMATION METHOD AND ITS OPTICAL/ELECTROPHYSICAL PROPERTIES Cherednychenko S.V., Dolbin A.V., Vinnikov N.A., Esel'son V.B., Gavrilko V.G., Basnukaeva R.M., Karachevtsev V.A., Plokhotnichenko A.M.	O19
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9.50-10.10	THE DETERMINATION OF MELATONIN CONTENT IN THE HUMAN BODY USING EXHALED GAS ANALYSIS Harbuz D.O., Pospelov A.P., Belan V.I., Gudimenko V.A., Vakula V.L., Kamarchuk L.V., Volkova Y.V., Kamarchuk G.V.	O20
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10.10-10.30	SQUARAIN AND NORSQUARAIN FLUORES-CENT DYES FOR PROTEIN INVESTIGATION Tatarets A.L., Hovor I.V., Kolosova O.S., Obukhova O.M., Sanin E.V., Fedyunyayeva I.A., Patsenker L.D., Terpetschnig E.A.	O23
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10.30-10.50	GELATIN AND ALBUMIN AS A REAL MODEL FOR IONS INFLUENCE STUDY ON THE PROTEIN CONFORMATIONAL STATES: AMYLOID FIBRIL FORMATION AND THEIR BIOLOGICAL SIGNIFICANCE Kurysheva O.A., Afonina U.K., Karachim S.O., Gnatyuk O.P., Dovbeshko G.I.	O21
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10.50-11.10	BIOLOGICAL ACTIVITY OF MALARIAL NANOCRYSTAL HEMOZOIN IS DUE TO HOST FIBRINOGEN: A NEWLY DESCRIBED MECHANISM OF INNATE IMMUNE RESPONSE TO MALARIA Skorokhod O., Barrera V., Schwarzer E.	O22
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11.10-11.20	<i>Best Contribution Award ceremony</i>
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11.20-11.50	<i>Coffee break</i>
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CONFERENCE HALL		Round table
<i>Chair</i>	<i>Prof. Karachevtsev V.A.</i>	
11.50-12.30	Round Table “How biophysics and nanosciences meet modern challenges: the case of COVID-19”	
12.30-12.40	<i>Closing Ceremony</i>	
12.40-13.30	<i>Time for Lunch</i>	
13.30	<i>Social Program</i> On the choice of participants: City tour, Excursion to Feldman Ecopark or to the renovated Kharkov Zoo	
8 OCTOBER, FRIDAY		
<i>Social program</i> (post-conference tour)		

POSTER SESSION 1

5 October, Tuesday

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P2	LUMINESCENCE OF CANCER CELLS CAUSED BY 2D-MoS₂ NANOPARTICLES Afonina U.K.*, Kolesnik D.L., Pyaskovskaya O.N., Solyanik G.I., Gnatyuk O.P., Posudievsky O.Yu., Karachim S.O., Belevskii P.A., Dovbeshko G.I.	26
P3	A TECHNIQUE LIPOSOMAL FORMS PREPARATION AS CARRIERS OF WATER-SOLUBLE AND WATER-INSOLUBLE DRUGS Barabash Yu.M.*, Olenchuk M.V.	27
P4	DIELECTRIC CHARACTERISTICS OF BLOOD CELLS AS BIOMARKERS FOR DIAGNOSTICS: EXPERIMENTAL DATA AND MATHEMATICAL MODELING Batyuk L.V.*, Kizilova N.N.	28
P5	PHASE BEHAVIOR OF AQUEOUS LAPONITE DISPERSIONS AT LOW TEMPERATURES Bobrova O.M. *, Narozhnyi S.V., Nardid O.A., Hovorova Yu.S., Khala I.P.	30
P6	HANDLING OF 3D STRUCTURES FORMED BY GRAPHENE OXIDE AND ORGANIC CATIONS Boryak O.A.*, Kosevich M.V., Shelkovsky V.S., Plokhotnichenko A.M., Stepanian S.G.	32
P7	SELF-ASSEMBLY OF VIRUS-LIKE NANOPARTICLES FROM THE BROME MOSAIC VIRUS Buchatskyi L.P.*	33
P8	DEPENDENCE OF A LIPID MEMBRANE PHYSICAL PROPERTIES ON ITS STRUCTURE AND COMPOSITION Bulavin L.A.*, Solovyov D.V., Doroshenko I.Yu., Nikolaenko T.Yu., Ivankov O.I.	35

P9	COMPUTER MODELLING OF THE STRUCTURES OF BSA–MONOMETHINOMONOCARBOXYPHENYL-SULFIDE IRON(II) CLATHROCHELATE SUPRAMOLECULAR ASSEMBLIES Chornenka N.V.* , Vakarov S.V., Kovalska V.B., Gumienna-Kontecka E., Voloshin Y.Z.	37
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P12	QUANTUM CHEMICAL STUDY OF BINDING OF CYANINE-BASED TELOMERASE INHIBITOR TO A PARALLEL DNA QUADRUPLEX Ilchenko M.M., Kryvorotenko D.V., Dubey I.Ya.*	41
P13	A NANOCONJUGATE OF POLYETHYLENE GLYCOL WITH CYANINE TELOMERASE INHIBITOR: PREPARATION AND CHARACTERIZATION Dubey L.V.* , Kryvorotenko D.V., Dubey I.Ya.	42
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P17	STRUCTURES AND FTIR SPECTRA OF 6-THIOPURINE MOLECULES PLACED IN AN AR MATRICES AND COMPOSITE FILMS WITH GRAPHENE OXIDE Ivanov A.Yu.* , Stepanian S.G., Rubin Yu.V., Belous L.F., Karachevtsev V.A.	50
P18	CONTROLLABLE STRUCTURES ON THE SURFACE OF NATURAL POLYMERS MADE BY PROTON BEAM WRITING AND FEMTOSECOND LASER TREATMENT Kalinkevich O.V.* , Polozhii H.Ye., Kolinlko S.V., Zinchenko Ye.I., Karpenko A.Yu., Baturin V.A., Ponomarev A.G., Kalinkevich A.N., Danilchenko S.N., Daskalova A., Angelova L., Buchvarov I.	51
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P24	DRUG-TARGET INTERACTIONS OF ANTIMICROBIAL PEPTIDES WITH PHOSPHOLIPIDS OF THE INNER MEMBRANE OF GRAM-NEGATIVE BACTERIA Lisnyak Yu.V.* , Sklyar N.I., Martynov A.V.	67

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