International symposium at Faculty of medical sciences

CURRENT ACHIEVEMENTS AND FUTURE PERSPECTIVES IN MEDICAL AND BIOMEDICAL RESEARCH

STIP, 24 NOVEMBER 2015
MULTIMEDIA CENTRE – UGD, STIP

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<td>9:15 – 9:35</td>
<td><strong>ASSOCIATE PROF. MARIJA DARKOVSKA SERAFIMOVSKA</strong>&lt;br&gt;Step forward of Macedonian agency for medicines and medical devices, establishment and strategic plan for development</td>
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<td>9:35 – 9:55</td>
<td><strong>ASSOCIATE PROF. ZORICA ARSOVSKA SARAFINOVSKA</strong>&lt;br&gt;Adherence to Therapy: A Modern Pharmacotherapeutic Approach</td>
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<td>9:55 – 10:15</td>
<td><strong>PROF. BILJANA GJORGJEVSKA</strong>&lt;br&gt;Use of disinfectants and antiseptics in selected health institutions in Republic of Macedonia</td>
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<td>10:15 – 10:35</td>
<td><strong>ASSOCIATE PROF. BISTRA ANGELOVSKA</strong>&lt;br&gt;Code of Ethics for Pharmacists – Pharmaceutical Chamber of Macedonia</td>
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<td><strong>CHAIR: PROF. MILKA ZDRAVKOVSKA</strong>&lt;br&gt;<strong>CO-CHAIR: ASS. PROF. DARINKA GJORGIEVA ACKOVA</strong></td>
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<td>10:10 – 11:50</td>
<td><strong>PROF. NEVEN ZARKOVIC</strong>&lt;br&gt;4-Hydroxynonenal – major bioactive marker of lipid peroxidation</td>
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<td>11:50 – 12:10</td>
<td><strong>ASSOCIATE PROF. TATJANA RUSKOVSKA</strong>&lt;br&gt;Nicotinamide adenine dinucleotide biosynthesis and consumption in dysfunctional white adipocytes</td>
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<td>12:10 – 12:30</td>
<td><strong>PROF. RUBIN GULABOSKI</strong>&lt;br&gt;New insights into the chemistry and functions of Coenzyme Q</td>
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<td>12:30 – 12:50</td>
<td><strong>ASSOCIATE PROF. DARKO BOSNAKOVSKI</strong>&lt;br&gt;Genetically modified systems to study muscular dystrophies</td>
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**INTERNATIONAL SYMPOSIUM AT FACULTY OF MEDICAL SCIENCES**

“Current achievements and future perspectives in medical and biomedical research”

**SCIENTIFIC PROGRAM**

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<td>Counteracting microbial biofilm formation onto dental materials</td>
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<td>Università del Piemonte Orientale, Novara, Italy</td>
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<tr>
<td>14:40 – 15:00</td>
<td>Prof. Elizabeta Zisovska</td>
<td>The endless potential of the umbilical cord blood for investigation, research and treatment</td>
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<td>15:00 – 15:20</td>
<td>Ass. Misko Milev</td>
<td>The cytokinesis-blocked micronucleus assay: Good choice for detection and evaluation of genotoxicity in human cells</td>
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<td>15:20 – 15:40</td>
<td>Prof. Lence Miloseva</td>
<td>Multiple predictive model for clinical and subclinical depression in adolescence</td>
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<td>16:40 – 17:00</td>
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<td>17:20 – 17:40</td>
<td>Prof. Emilija Janevik Ivanovska</td>
<td>Drug development based on radiolabeled antibodies</td>
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The organizers would like to acknowledge the support given from the University Goce Delcev- Stip and the Pharmaceutical chamber of Macedonia. Gratitude is expressed to Alkaloid AD Skopje and Fitofarm for the financial support.
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“Current achievements and future perspectives in medical and biomedical research”
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2. Adherence to Therapy: A Modern Pharmacotherapeutic Approach
   Author: Zorica Arsovska Sarafinovska

3. Use of disinfectants and antiseptics in selected health institutions in Republic of Macedonia
   Author: Biljana Gjorgjeska

4. Code of Ethics for Pharmacists – Pharmaceutical Chamber of Macedonia
   Author: Bistra Angelovska

5. 4-Hydroxynonenal – major bioactive marker of lipid peroxidation
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6. Nicotinamide adenine dinucleotide biosynthesis and consumption in dysfunctional white adipocytes
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8. Genetically modified systems to study muscular dystrophies
   Author: Darko Bosnakovski

9. Counteracting microbial biofilm formation onto dental material
   Author: Lia Rimondini

10. The endless potential of the umbilical cord blood for investigation, research and treatment
    Author: Elizabeta Zisovska

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    Author: Adriano Duatti

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15. The role of molecular cocrystals in drug development
    Author: Aleksandar Cvetkovski

16. Drug development based on radiolabeled antibodies
    Author: Emilija Janevik-Ivanovska
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2. Effect of kinesitherapy on physical activity in patient with Guillain-Barré syndrome  
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4. Treatment of cervical spondylosis with acupuncture  
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12. Monitoring of the renal function in Indometacin treated patients with rheumatoid arthritis  
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13. Incidence of breast cancer in Macedonia  
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14. HPV virus as a cause of cancer of the cervix in R.Macedonia  
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25. Prosthetic rehabilitation in patient with advanced degree of functional disorders (case report)  
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28. Alveolar socket preservation and shaping using temporary prosthetic construction – cases presentation  
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29. Porcelain veneers produced by refractory die method  
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31. Assessment of orthodontic treatment need among school children by using iotn (index of orthodontic treatment need)  
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37. Evaluation of Different Preparation of Artificial Teeth and Acrylate Prosthetic Base  
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40. Mobile dental NOG-types used in working dental models
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Authors: Darinka Gjorgieva Ackova, Katarina Smilkov, Icko Gjorgoski, Emiliija Janevik-Ivanovska;

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43. Mouse Models For Human Prostate Cancer: Xenograft Vs Genetically Engineered Mouse Model
Authors: Aschalew Alemu Marie, Joel Munene Muchira, David Mwanza Wanjeh, Darko Bosnakovski;

44. HER2 Transgenic Mouse Models: A Way To HER2+ Breast Cancer Targeted Therapy
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45. Types of scaffolds and thier application in bone tissue engineering
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49. An overview of phytosomes as a novel herbal drug delivery system
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50. Determination of active pharmaceutical ingredient – chloropyramine in dragées
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51. Comparison of volatile aroma compounds between cultivated and spontaneous flowering stems of Sideritis scardica Griseb. from R. Macedonia
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52. Bioactive compounds of cold-pressed oil from the seeds of Gojy Berry (Lycium barbarum)
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53. Development and validation of HPLC method for determination of flavonoids in herbal preparations
Authors: Tanja Janeva, Zorica Arsova-Sarafinovska;

54. Atomic emission spectrometry with inductively coupled plasma (ICP-AES) analysis of trace elements in Camellia sinensis teas
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55. Determination of trace elements analyzed by atomic emission spectrometry with inductively coupled plasma (ICP-AES) in Matricaria chamomilla L. teas present on macedonian market
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56. Human health risks from heavy metals via consumption of contaminated food
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57. Development of an ultrasonic method for effective extraction of capsaicin as a potent bioactive compound
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59. Comparison of the procedure for registration of medicines in the European Union and the Republic of Macedonia
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60. Pharmacoeconomic evaluation of the antibiotic prophylaxis in orthopedic surgeries
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67. Accreditation of the Laboratory of Radiopharmacy – requested requirements or need of challenge
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68. Quality control of PET radiopharmaceuticals, with reference to its specifics vs quality control of conventional pharmaceuticals
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69. Production of [11C] Choline in The University Institute for PET – new perspective in diagnostics of prostate malignancy in R. of Macedonia
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70. PET radiopharmaceuticals in the diagnosis of neurological diseases
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71. Achievements and perspectives in formulation of stable immunoconjugate of the HER2-targeting trastuzumab – potential for rapid labelling with Gallium-68
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Molecular Imaging and therapy with radionuclides of prostate cancer

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Abstract

Prostate cancer (PC) is the most common type of cancer in men worldwide leading to substantial morbidity and mortality. At present, imaging of PC is indicated for primary diagnosis, staging and re-staging, as well as for the detection of (biochemical) recurrent disease. Currently, conventional imaging modalities, including ultrasound, bone scintigraphy, and computed tomography (CT) are used to detect primary and metastatic PC for staging and risk stratification. Despite significant efforts, conventional imaging of PC does not contribute to patient management and do not allow tumor-specific imaging. Radionuclide imaging techniques such as single-photon emission computed tomography (SPECT/CT) and positron emission tomography (PET)/CT provide both high sensitivity to detect tumor lesions, and characterization of the disease at the molecular level (molecular imaging).

Choline radiolabeled with C-11 or F-18 is currently used as PET tracer for (re)staging of PC. Since choline is a key precursor in the biosynthesis of phosphatidylcholine, a major component of the cell membrane, increased levels of total choline incorporation have been observed in several malignancies. However, this molecular approach has limited sensitivity due to the lack of target specificity inherently to its uptake mechanism.

The prostate-specific membrane antigen (PSMA) is a type II integral membrane glycoprotein that is selectively overexpressed in 90-100% of local PC lesions, as well as in cancerous lymph nodes, and bone metastases. Increased PSMA expression is correlated with an increase in tumor grade, pathological stage, aneuploidy, and biochemical recurrence. Most importantly, PSMA expression is upregulated when tumors become androgen-independent, showing elevated PSMA expression after anti-androgen therapy. This characteristic makes PSMA a reliable tissue marker for PC and is considered an ideal target for theranostic applications.

Imaging probes specifically targeting PSMA are actively investigated and a number of highly promising agents radiolabeled with Tc-99m, F-18, Cu-64 and Ga-68 are currently under extensive clinical evaluation. Besides diagnostic imaging, radiolabeled PSMA ligands also have potential for radionuclide therapy of PC and a new therapeutic agent radiolabeled with Lu-177 has been developed and tested in patients. These promising preliminary clinical data encourage further studies to evaluate potential for diagnosis and therapy (theranostic) of PC using PSMA ligands. The added value of this therapeutic regimen needs to be compared to conventional PC therapies.

Recently, it has been surprisingly reported the observation of high and specific accumulation of copper ions in prostate cancer cells after administration of Cu-64 under the simple chemical form of dichloride salt. This result will open a new and unexpected route to PC diagnosis and treatment since the nuclear characteristics of Cu-64 allow using this radionuclide as both imaging and therapeutic agent. Clinical studies in patients are ongoing and showing high potential for this new approach.
In this presentation, the clinical status of radiopharmaceuticals for theranostic applications in PC will be discussed.

**Keywords:** prostate cancer, molecular imaging, imaging probes, radiopharmaceuticals.