

# 1st Symposium on Theranostics

<b>Saturday, 9<sup>th</sup> October 2021</b>	
<b>9:00 - 9:20</b>	<b>Opening ceremony</b> <b>chairs: Paweł Moskal and Ewa Stępień</b>
<b>9:20 - 9:40</b>	<b>Prof. Zbigniew Rudy Memorial Session</b> <b>chair: Beatrix Hiesmayr</b>
<b>9:20 - 9:40</b>	<b>Zbyszek</b> Bogusław Kamys, Jagiellonian University, Poland <b>Presentations of Zbigniew Rudy J-PET prize</b>
<b>I</b>	<b>Morning session</b> <b>chairs: Catalina Curceanu, Ernesto Alfaro-Moreno</b>
<b>9:40 - 10:00</b>	<b>Perspectives for Total-Body PET in Poland</b> Paweł Moskal, Jagiellonian University, Poland
<b>10:00 - 10:20</b>	<b>Extracellular vesicles – their potential in theranostics</b> Ewa Stępień, Jagiellonian University, Poland
<b>10:20 - 10:40</b>	<b>History of radiotherapy in Poland. A brief outline of the problem</b> Ryszard Gryglewski, Jagiellonian University - Medical College, Poland
<b>10:40 - 11:10</b>	<i>Coffee break</i>
<b>II</b>	<b>Noon session</b> <b>chair: Wojciech Wiślicki</b>
<b>11:10 - 11:30</b>	<b>Nano-theranostics: harnessing nanoscale functionality for next-generation theranostic technologies</b> Zdenka Kuncic, University of Sydney, Australia
<b>11:30 - 11:50</b>	<b>Whole gamma imaging: PET combined with Compton imaging</b> Taiga Yamaya, National Institute of Radiological Sciences, Japan
<b>11:50 - 12:10</b>	<b>Ps in solutions - could be of help for PET and detection of carcinogens?</b> Sergey Stepanov, Institute of Theoretical and Experimental Physics, Russia
<b>12:10 - 12:30</b>	<b>Oxygen sensing ability of positronium</b> Kengo Shibuya, University of Tokyo, Japan
<b>12:30 - 12:50</b>	<b>How quantum entanglement can help in theranostics?</b> Beatrix Hiesmayr, University of Vienna, Austria
<b>12:50 - 13:10</b>	<b>First three-photon positronium image obtained with the J-PET scanner: towards multi-photon imaging</b> Aleksander Gajos, Jagiellonian University, Poland
<b>13:10 - 15:00</b>	<i>Lunch</i>
<b>III</b>	<b>Afternoon session</b> <b>chair: Barbara Błasiak</b>
<b>15:00 - 15:20</b>	<b>Cyclotron production of theranostic pair 43/44Sc - 47Sc on calcium targets</b> Rafał Walczak, Institute of Nuclear Chemistry and Technology, Poland
<b>15:20 - 15:40</b>	<b>In vitro and in vivo studies of iron oxide nanoparticles toxicity with theranostic potential</b> Joanna Chwiej, AGH University of Science and Technology, Poland
<b>15:40 - 16:00</b>	<b>Theranostics in particle therapy</b> Antoni Ruciński, Institute of Nuclear Physics, Polish Academy of Sciences, Poland
<b>16:00 - 16:20</b>	<b>Characterization and research on a large axial field of view PET in Bern</b> Kuanguyu Shi, Inselspital, University of Bern, Switzerland
<b>16:20 - 16:40</b>	<b>Total-Body PET Kinetic Modeling and Parametric Imaging with EXPLORER</b> Guobao Wang, University of California, USA

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16:40 - 17:00	Coffee break
IV	<b>Evening session</b> <b>chairs: Paweł Moskal and Ewa Stępień</b>
17:00 - 18:00	<b>Unparalleled and Revolutionary Impact of PET Imaging on Research and Day to Day Practice of Medicine</b> Abass Alavi, Hospital of the University of Pennsylvania, USA
20:00	Conference dinner

Sunday, 10 <sup>th</sup> October 2021	
V	<b>Morning session</b> <b>chair: Elena Perez del Rio</b>
9:00 - 9:20	<b>Positron annihilation as a process to observe of the pathogenic tissue modification</b> Bożena Jasińska, Maria Curie-Skłodowska University, Poland
9:20 - 9:40	<b>Solid-liquid structure model for Ps-based oncological nanodiagnosics</b> Bożena Zgardzińska, Maria Curie-Skłodowska University, Poland
9:40 - 10:00	<b>X-ray detectors for exotic atoms and other types of applications</b> Catalina Curceanu, National Laboratory of Frascati, Italy
10:00 - 10:20	<b>Test targets for J-PET experiments with medicine and physics</b> Marek Gorgol, Maria Curie-Skłodowska University, Poland
10:20 - 10:40	<b>Polystyrene-based plastic scintillators for theranostics applications</b> Łukasz Kapłon, Jagiellonian University, Poland
10:40 - 11:00	Coffee break
VI	<b>Noon session</b> <b>chair: Bartosz Leszczyński</b>
11:00 - 11:20	<b>Innovative positron emission tomography for a beam range monitoring in proton radiotherapy</b> Jakub Baran, Jagiellonian University, Poland
11:20 - 11:40	<b><sup>103</sup>Pd/<sup>103m</sup>Rh in-vivo generator for Auger electron targeted therapy</b> Nasrin Gharibkandi, Institute of Nuclear Chemistry and Technology, Poland
11:40 - 12:00	<b>3D printed lightweight and modular lithium-ion uninterruptible power booster for medical devices</b> Gabriel Moskal, Jagiellonian University, Poland
12:00 - 12:20	<b>Metabolic and positronium imaging sensitivity of the total body J-PET tomographs</b> Szymon Parzych, Jagiellonian University, Poland
12:20 - 13:00	<b>Poster session</b> <b>chairs: Szymon Niedźwiecki, Magdalena Skurzok</b>
13:00 - 15:00	Lunch
15:00 - 16:30	<b>Poster session</b> <b>chairs: Szymon Niedźwiecki, Magdalena Skurzok</b>
16:30 - 18:00	Discussion session

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<b>Monday, 11<sup>th</sup> October 2021</b>	
<b>IX</b>	<b>Morning session</b> <b>chair: Wojciech Krzemień</b>
<b>9:00 - 9:20</b>	<b>New technologies for Total Body PET imaging</b> Stefaan Vandenberghe, Ghent University, Belgium
<b>9:20 - 9:40</b>	<b>List-mode TOF MLEM reconstruction for the total-body J-PET with a realistic system response matrix</b> Roman Shopa, National Centre for Nuclear Research, Poland
<b>9:40 - 10:00</b>	<b>Micro-CT journey - from bones to personalized medicine</b> Bartosz Leszczyński, Jagiellonian University, Poland
<b>10:00 - 10:20</b>	<b>Introduction of non-image PET data transformation to image-form for classification using convolutional neural networks</b> Lech Raczyński, National Centre for Nuclear Research, Poland
<b>10:20 - 10:40</b>	<b>Theranostic and Monte Carlo simulation</b> David Sarrut, Universite de Lyon, France
<b>10:40 - 11:10</b>	<i>Coffee break</i>
<b>X</b>	<b>Noon session</b> <b>chair: Joanna Chwiej</b>
<b>11:10 - 11:30</b>	<b>PRRT as a tool for treatment of severe hypoglycemia in patients with primary inoperable insulinoma</b> Marta Opalińska, University Hospital in Krakow, Poland
<b>11:30 - 11:50</b>	<b>Radioactive arsenic (III) compounds as potential theranostic radiopharmaceuticals</b> Monika Łyczko, Institute of Nuclear Chemistry and Technology, Poland
<b>11:50 - 12:10</b>	<b>Novel and fast method of gene mutation identification using surface enhanced Raman spectroscopy (SERS)</b> Jan Krajczewski, University of Warsaw, Poland
<b>12:10 - 12:30</b>	<b><sup>193m</sup>m,<sup>195m</sup>mPt-based nanobioconjugates for combined „chemo-Auger” theranostics of hepatocellular carcinoma (HCC) and HER2+ breast cancer</b> Kamil Wawrowicz, Institute of Nuclear Chemistry and Technology, Poland
<b>12:30 - 12:50</b>	<b>Quercetin loaded mesoporous silica nanoparticles to contrast gram positive and gram negative bacteria infections</b> Cristina Carucci, University of Cagliari, Italy
<b>12:50 - 15:00</b>	<i>Lunch</i>
<b>XI</b>	<b>Afternoon session</b> <b>chair: Tomasz Kozik</b>
<b>15:00 - 15:20</b>	<b>Targeted nanoparticles for cancer detection in animal models</b> Barbara Błasiak, Institute of Nuclear Physics, Polish Academy of Sciences, Poland
<b>15:20 - 15:40</b>	<b>Uncovering the diagnostic power of exosomes for prosthetic joint failure</b> Ana Ribeiro, International Iberian Nanotechnology Laboratory, Portugal
<b>15:40 - 16:00</b>	<b>β-lactoglobulin as a platform for designing biologically active carriers – experimental and computational studies</b> Paulina Komorek, Institute of Catalysis and Surface Chemistry, Poland
<b>16:00 - 16:20</b>	<b>Positronium imaging with the J-PET detector for the medical purposes</b> Kamil Dulski, Jagiellonian University, Poland
<b>16:20 - 16:50</b>	<b>Total-Body PET: System Design and Applications</b> Suleman Surti, University of Pennsylvania, USA
<b>16:50 - 17:20</b>	<b>Award ceremony for the best posters</b> <b>Closing of the conference</b>

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**Poster sessions on Sunday, 10<sup>th</sup> October 2021,**

**12:20 – 13:00 and 15:00 – 16:30**

**Chairs: Magdalena Skurzok, Szymon Niedźwiecki**

<b>Poster no.</b>	<b>Presenter</b>	<b>Poster title</b>
<b>1</b>	Marta Opalińska	<b>PRRT as a tool for treatment of severe hypoglycemia in patients with primary inoperable insulinoma</b>
<b>2</b>	Natalia Janik-Olchawa	<b>The in vitro study of the toxicity and therapeutic effects of iron oxide nanoparticles with different core size</b>
<b>3</b>	Neha Chug	<b>CPT symmetry test in positronium annihilations with the J-PET detector</b>
<b>4</b>	Katarzyna Matusiak	<b>The use of x-ray volume imaging system for verification of the positioning accuracy during stereotactic radiotherapy of the head and lungs</b>
<b>5</b>	Majid Kazemi Kozani	<b>Event identification in Compton camera imaging via machine learning for proton therapy monitoring</b>
<b>6</b>	Keyvan Tayefi Ardebili	<b>A simulation study to compare performance of analog and digital silicon photomultiplier tube by LTspice package</b>
<b>7</b>	Hanieh Karimi	<b>Positronium biomarker in 3D melanoma spheroid model, a novel probe for cancer diagnosis</b>
<b>8</b>	David MacDonald	<b>Optimization and enhancement of CNR in MRI using core/shell contrast agent</b>
<b>9</b>	Magdalena Surman	<b>Comparison of SP3 and S-Trap LC-MS/MS approaches in proteomic analysis of ectosomes derived from thyroid cancer and normal thyroid follicular cells</b>
<b>10</b>	Dominik Panek	<b>Classification of heavy metal contaminated samples based on micro-CT images using machine learning algorithms</b>
<b>11</b>	Monika Szczepanek	<b>A new model for spheroid growth</b>
<b>12</b>	Magdalena Marzec	<b>Spectrometric study of biomolecular differences of <math>\beta</math>-cell EVs subpopulations from hyperglycemic conditions</b>
<b>13</b>	Carina Rząca	<b>ATR-FTIR spectroscopy of extracellular vesicles derived from endothelial cells cultured in hyperglycemic conditions</b>
<b>14</b>	Shivani	<b>The present and the future of breast cancer diagnosis</b>
<b>15</b>	Jakub Boratyński	<b>Cyclotron produced gallium-68 chloride [<math>^{68}\text{Ga}</math>]GaCl<sub>3</sub> as an alternative to <math>^{68}\text{Ge}/^{68}\text{Ga}</math> generators</b>
<b>16</b>	Ewelina Kubicz	<b>Free radicals influence on the positronium lifetime in melanocytes and melanomas cell cultures</b>
<b>17</b>	Magdalena Szota	<b>Physicochemical characteristic of poly(amidoamine) dendrimers are their application in controlled drug delivery systems</b>
<b>18</b>	Anzori Georgadze	<b>Fast scanning of spent nuclear fuel dry storage casks using cosmic ray muons: Monte Carlo simulation study</b>
<b>19</b>	Paweł Konieczka	<b>Convolutional neural networks in classification of multi-photon coincidences in J-PET scanner</b>
<b>20</b>	Agata Jędruszczak	<b>Simulations of absorption in the brain of gamma quanta from positronium atoms</b>

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<b>21</b>	Julia Nizioł	<b>The development of a method for determining ortho-Positronium mean lifetime in extracellular vesicles using Positron Annihilation Lifetime Spectroscopy</b>
<b>22</b>	Kamil Rakowski	<b>BSA as a biologically active nanocarriers – computational studies</b>
<b>23</b>	Konrad Skórkiewicz	<b>Assessment of the influence of the Beta parameter in the reconstruction of Q.Clear</b>
<b>24</b>	Adrian Kania-Kuc	<b>Myocardial perfusion scintigraphy - criteria of SPECT/CT protocol selection</b>