



International Workshop on EPR in Biology and Medicine

Krakow, Poland
October 6-10, 2019

www.internationalEPRworkshop.pl

SCIENTIFIC
PROGRAM

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SUN, OCT 6

18:00-21:30
WELCOME RECEPTION

MON, OCT 7

8:25	Introductory remarks (Tadeusz Sarna)
#1	ADVANCES IN EPR INSTRUMENTATION AND METHODOLOGIES (Chair: Wojciech Froncisz)
8:30	Keynote. Small-sample EPR sensitivity using a rutile dielectric tube LGR insert (James Hyde)
9:00	Spin magnetic resonance spectroscopy – From billions of molecules to single molecule (Jiangfeng Du)
9:20	ENDOR spectroscopy at 263 GHz (Igor Tkach)
9:40	Can we improve signal to noise ratio for EPR dispersion signal? (Wojciech Froncisz)
10:00	Recent developments in Bruker's EPR instrumentation (Sylvia Kacprzak)
10:20	Break
#2	METALS IN BIOLOGY (Chairs: Piotr Pietrzyk & Zbigniew Sojka)
10:40	Plenary. Life without water: High-field EPR studies of protein/matrix h-bond interactions (Klaus Moebius)
11:10	How copper ions tip the toxic balance of the killer prion protein (Glenn Millhauser)
11:30	Reactivity studies of molybdo-enzymes by EPR spectroscopy: Toward understanding biological CO ₂ reduction (Bruno Guigliarelli)
11:50	Beyond structure: Investigating paramagnetic states in protein crystals of nano-liter volumes at X-band (Jason Sidabras)
12:10	Lunch
#3	OXIMETRY / IN VIVO EPR IMAGING / SPIN TRAPPING (Chair: Martyna Elas)
13:40	Plenary. Biologic validation of spin lattice relaxation based EPR pO ₂ images and biologic consequences of 3D tumor topology (Howard Halpern)
14:10	Measurement of oxygen concentration (pO ₂) in human tumors using OxyChip (Periannan Kuppusamy)
14:30	EPR of melanin in melanomas: From in vitro to ongoing clinical studies (Bernard Gallez)
14:50	Novel multifunctional EPR probes and imaging (Valery Khramtsov)
15:10	Tumor oximetry and redox state measurements in vivo (Martyna Elas)
15:30	Break
#4	ADVANCED SPECTROSCOPY AND MICROSCOPY METHODS (Chair: Michal Sarna)
15:50	Plenary. Development of ultrafast single-molecule imaging and detection of hop diffusion within the focal adhesion in the cell membrane (Akihiro Kusumi)
16:20	In vivo eye imaging: To see the morphology and the function (Maciej Wojtkowski)
16:40	Interaction of visible light with DNA in living cells (Jerzy Dobrucki)
17:00	Atomic force microscopy of supported lipid bilayers: imaging and force spectroscopy (Andrea Alessandrini)
17:20	Imaging cellular structures below the cell membrane using higher harmonics atomic force microscopy (Michael Sarna)
17:40	Adjourn

TUE, OCT 8

#5	OXIDATIVE DAMAGE IN BIOLOGICAL SYSTEMS (Chair: Izabella Sadowska-Bartosz)
8:30	Plenary: Mapping of oxidative damage to proteins (Michael Davies)
9:00	Proteins in oxidative stress: victims, defenders, accomplices and messengers (Grzegorz Bartosz)
9:20	Free radical mechanism for the formation of new chiral DNA adducts and their biological effects (Benny Zhu)
9:40	Redox nanoparticles: synthesis, properties and perspectives of use for treatment of neurodegenerative diseases (Izabella Sadowska-Bartosz)
10:00	Decoding oxidative stress from inflammation in experimental and human exposures (Maria Kadiiska)
10:20	Break
#6	MRI, EPRI AND MÖESSBAUER SPECTROSCOPY IN BIOMEDICAL RESEARCH (Chairs: Kvetoslava Burda & Luigi Zecca)
10:40	Plenary. Molecular imaging of the tumor microenvironment (Murali Krishna Cherukuri)
11:10	Neuromelanin detection by MRI and its potential use as a biomarker for Parkinson's disease (Luigi Zecca)
11:30	Regulation of Fe-Q _A *- interaction by iron spin states in photosystems of type II (Kvetoslava Burda)
11:50	A new perspective in whole-body preclinical EPR imaging (Michael Gonet)
12:10	Photoprotective properties of vitamin D and lumisterol hydroxyderivatives (Andrzej Slominski)
12:30	Lunch
#7	FREE RADICALS AND EXCITED STATE SPECIES IN PHOTOBIOLOGY (Chair: Tadeusz Sarna)
14:00	Plenary 1. Structural and biophysical studies on the acetylcholinesterase/methyl blue complex are relevant to photodynamic therapy, radiation damage, and drug design (Lev Weiner)
14:30	Plenary 2. From local control to systemic solid state cancer therapy using the approved TOOKAD soluble (Avigdor Scherz)
15:00	EPR study of regulation of electron and proton transport processes in the plant cell (Alexander Tikhonov)
15:20	Photochemistry of melanin pigments – Role of free radicals and excited states (Tadeusz Sarna)
15:40	Break
#8	NEW SPIN LABELS, REDOX PROBES AND SPIN TRAPS (Chairs: Adam Sikora & Jacek Zielonka)
16:00	Plenary. Connecting the dots: Brain region, tetrahydrobiopterin, and hypertension (Jeannette Vasquez Vivar)
16:30	Toward the understanding of the chemistry behind the *NO/H ₂ S/O ₂ and *NO/Thiols/O ₂ systems (Adam Sikora)
16:50	Trityl spin probes in distance measurements in biomolecules using SDSL and pulsed ESR (Victor Tormyshev)
17:10	Mitochondria-targeted pyridinium cations as redox cyclers, mitochondrial inhibitors and antiproliferative agents against pancreatic cancer cells (Jacek Zielonka)
17:30	ROS detection in mesoporous silica particles (Micael Hardy)
#9	POSTER PRESENTATIONS
17:50	Adjourn
18:45	Adjourn

WED, OCT 9

#10	MITOCHONDRIAL REDOX SIGNALING (Chair: Artur Osyczka)
8:30	Plenary. Mechanism and regulation of mitochondrial complex I (Ulrich Brandt)
9:00	Energy to drive Photosystem II borrowed from Photosystem I (Wieslaw Gruszecki)
9:20	Spin-spin coupling between the semiquinone and the Rieske cluster in cytochrome bc1 and its relation to superoxide production (Sebastian Pintscher)
9:40	Rieske/cytb complexes: Regulators of ΔΨ in bioenergetic reaction chains? (Frauke Baymann)
10:00	New EPR spectroscopy insights into the assembly of the catalytic H-cluster of [Fe-Fe] hydrogenase (R. David Britt)
10:20	Break
#11	STEM CELLS AND TISSUE ENGINEERING (Chair: Zeljko Bosnjak)
10:40	Plenary. Stem cells and precision medicine (Zeljko Bosnjak)
11:10	Stem cell-derived extracellular vesicles – Biological properties and perspectives in use for tissue repair (Ewa Zuba-Surma)
11:30	Repairing the human esophagus with tissue engineering (Kulwinder Dua)
11:50	Stem cell engineering in liver and cardiac applications (Bo Wang)
12:10	Identifying and monitoring critical quality attributes of cardiac cell biomanufacturing using NMR metabolomics (Sean Palecek)
12:30	Lunch
#12	SHORT ORAL PRESENTATIONS (Chair: Larry Berliner)
14:00	Pathological calcification and calcium phosphates: The results of clinical and physicochemical characterizations for operational tissues and synthesized species (MR Gafurov)
14:12	Quantification and characterization of radical production in skin during and after LED-UVA and complete sun irradiation (MC Meinke)
14:24	Photoreactivity of curcumin in a model system and in vitro (A Wiśniewska-Becker)
14:36	ROS generation via copper redox cycling mediated by Cu(II) complex with isonicotinamide and NSAIDs (M Šimunková)
14:48	Bioactivation pathways in human ovarian follicular fluid derived mesenchymal stem cells cultured on chitosan/PCL/Zn scaffold for bone tissue regeneration (Anuradha Dhanasekaran)
15:00	Break
15:20	A convenient method for synthesis of sterically shielded pyrrolidine and pyrroline nitroxides (IA Kirilyuk)
15:35	Combined DFT and EPR study of newly synthesized TEMPO/PROXYL-derived bis(amide) compounds (M Malček)
15:47	Reduction-resistant nitroxide spin probes for EPR imaging (YF Polienko)
15:59	ROS generation via H ₂ O ₂ decomposition over nanozymes of peroxidase- or catalase-like activity (K Sobańska)
16:11	In-cell PELDOR spectroscopy of short RNA duplexes (A Collauti)
16:23	Adjourn
19:00	BANQUET

THU, OCT 10

#13	ADVANCES IN LIPID AND MEMBRANE BIOPHYSICS (Chair: W. Karol Subczynski)
8:30	Plenary. Network of lipid interconnections at the interfaces of lipid bilayers as revealed by molecular modeling and graph theory (Marta Pasenkiewicz-Gierula)
9:00	Nitric oxide inhibition of chain lipid peroxidation in membrane systems (Albert Girotti)
9:20	Methodological advances in preparations of model lipid bilayer membranes with high cholesterol content (Marija Raguz)
9:40	Cholesterol dependent homeostasis in eye lens membranes, fiber cells, and the lens: A biophysical perspective (W. Karol Subczynski)
10:00	Cholesterol-hydroperoxide mobility; implications and biological consequences (Witold Korytowski)
10:20	Break
#14	REACTIVE OXYGEN AND NITROGEN SPECIES (Chair: Anatolij Vanin)
10:40	Plenary. Why should we consider singlet oxygen? (Peter Ogilby)
11:10	The role of reactive oxygen and nitrogen metabolites in the formation of nitrosyl iron complexes in living systems (Enno Ruuge)
11:30	Dinitrosyl iron complexes with thiol-containing ligands as a basic "working form" of nitric oxide in living organisms (Anatolij Vanin)
11:50	Cell-gene therapy addressed to the microenvironment of hypoxia-dependent diseases (Claudine Kieda)
12:10	Lunch
#15	SHORT ORAL PRESENTATIONS (Chair: Anna Wisniewska-Becker)
13:40	Rigid spin label distance measurements to the calcium binding site of bovine α-lactalbumin (Larry Berliner)
13:55	The new theory of stage apoptosis (N Chaikovskaia)
14:07	The Influence of iron on selected properties of synthetic pheomelanin (AC Żądło)
14:19	The kinetics of the HNO reaction with thiols (R Smulik-Izydorzyczyk)
14:31	An implantable microchip for clinical EPR oximetry (MM Kmiec)
14:43	Membrane heterogeneity using stretched exponential saturation recovery EPR spin labeling: Enhancement by molecular oxygen (N Stein)
14:55	Closing remarks (Larry Berliner)
15:10	Adjourn