ZAGADNIENIA BIOFIZYKI WSPÓŁCZESNI



# Current Topics in Biophysics

## CONTENTS

Tadeusz Sarna 5th Workshop on Applications of EPR in Biology and Medicine	. 5
James S. Hyde, Richard R. Mett Aqueous Sample Considerations in Uniform Field Resonators for Electron Paramagnetic Resonance Spectroscopy	. 7
Pavel Cevc, Tadeusz Walczak, Harold M. Swartz Whole Body L-band Resonator With a Wide Range Frequency Tuning Using	
Lawrence J. Berliner, Valery Khramtsov, Thomas L. Clanton & Hirotoda Fujii NMR and MRI Spin Trapping: Using NMR to Learn About Free Radical Reactions	21
Periannan Kuppusamy, Murali C. Krishna EPR Imaging of Tissue Redox Status	29
Marcin Brynda, Cosmina Dutan, Théo Berclaz, Michel Geoffroy Dynamic Phenomena in Barrelenephosphinyl Radicals: a Complementary Approach by Density Matrix Analysis of EPR Spectra and DFT Calculation	35
Sabastiano S. Lemos, Hua Yuan, Mary Lynne Perille Collins, William E. Antholine Review of Multifrequency EPR of Copper in Particulate Methane Monooxygenase	43
Brian Bennett  EPR of Co(II) as a Structural and Mechanistic Probe of Metalloprotwin Active Sites:  Characterisation of an Aminopentidase	49

10		47	Edit	
	- 6 F C 8			UI 3

R. A. Demel (Utrecht)

R. M. Epand (Hamilton)

S. K. Jain (Shreveport)

J. Kiefer (Gießen)

W. T. Konings (Groningen)

A. Kusumi (Tokyo)

S. J. Łukiewicz (Kraków)

R. K. Mishra (New Dehli)

F. Musumeci (Catania)

F. A. Popp (Kaiserslautern)

L. Rakoczy (Kraków)

A. Zieliński (Sopot)

Przemysław Płonka

**Current Topics in Biophysics** 

Manuscripts should be submitted in

Subscription orders should be sent

Polish Biophysical Society, Katedra

ul.Fredry 8. Annual subscription

Janusz Sławiński

The publication of this issue was founded by 5th Frameworks Programme of European Union

### **INFORMATION FOR CONTRIBUTORS**

### I. General

- The editors of the Current Topics in Biophysics are prepared to accept direct experimental reports, reviews
  and theoretical articles. Papers submitted may deal with any problems related to biophysics.
- 2. Papers should be submitted in English to:

Prof. Andrzej Dobek, Department of Biophysics, Adam Mickiewicz University of Poznań, Umultowska 85, PL-61-614 Poznań, Poland.

The submission of the manuscript is regarded as the author's statement that it has not been published (or submitted for publication elsewhere).

# II. Specific

- Manuscripts and illustrations should be submitted in duplicate. Double-spaced typing and at least 2 cm margins are required. The length of manuscript is not limited.
- The first page must include: the title; name of author(s); affiliation(s); short running title (no more than 50 characters, including spaces); a detailed address for correspondence.
- 3. References should be cited in the text by giving the last name of the author (or authors) followed by the year of publication in parentheses, e.g. Reich (1970), Liboff and Furst (1974). If there are three or more authors, citations, need give only the first author, e.g. Pineri, Escobues and Roche (1978) becomes Pineri et al. (1978). If there is more than one work by the author (or authors) in a given year, label them alphabetically within each year, e.g. Lang (1966a, 1966b).
- 4. The full list of references should be typed on a separate. It should include the names of all the authors and their initials, the year of publication in parentheses, the full title of the article or book, the standard abbreviated name of the journal, the volume number and the pages; and, for books, the city of publication and the publisher. The following may serve as illustrations:

Stepień K. & Wilczok T.(1982). Studies of the mechanism of chloroquine binding to synthetic DOPA-melanin. Biochem. Pharmacol., 31, 3359-3365.

Gennis R. B. (1989). Biomembranes. Molecular structure and functions. Springer-Verlag: New York.

Frackowiak D., Planner A. & Wiktorowicz K. (2001c). Near-infrared applications in medicine. [In:] Raghavachari R. & Dekker M. (Eds.), *Near-Infrared Applications in Biotechnology* (pp. 151-184) New York, Brasel: M. Dekker.

- 5. All photographs, graphs and diagrams should be referred to as "Figures" (abbreviated to "Fig") and should be numbered consecutively. The proper sites for their insertion should be indicated in the text. The legends should be typed, correspondingly, on a separate page. The author's name, figure number, and an indication of its proper orientation should be indicated on the back of each figure. Tables should be numbered consecutively in Arabic numerals.
- 6. If a manuscript is accepted for publication, electronic files will then have to be submitted for both the text and the graphics. If, for some reason, the electronic file for a figure cannot be used, the hard copy will be scanned. Scanning produces best results from simple line art, so authors may wish to design figures that do not include textures and halftones, which do not reproduce well when scanned. Authors who want to avoid having to recreate their figures if their article is accepted should note that the preferred format for electronic graphics files is EPS, although TIFF is a good alternative. Also, figures need to be saved at a resolution of at least 300 dpi. It is therefore advisable not to create figures using presentation application software (e.g., PowerPoint) or other software that does not allow files to be saved in EPS or TIFF format at a high
- 7. The cost estimate of 100 reprints will be sent to the author for his approval after submission of the manuscript. Moreover, authors can obtain a free of charge a pdf file with their contribution.

# 5<sup>th</sup> Workshop on Applications of EPR in Biology and Medicine

It is with a great pleasure that we publish a collection of papers presented during the 5<sup>th</sup> Workshop on Applications of EPR in Biology and Medicine. The Workshop took place in the International Culture Centre "Raven's Hall" and in the new building of the Institute of Molecular Biology and Biotechnology, Jagiellonian University, Krakow, Poland from 30<sup>th</sup> September –3<sup>rd</sup> October, 2001.

Leading experts in the field of EPR spectroscopy came to Krakow from USA, Germany, Italy, France, Slovenia, Switzerland, Hungary, Russia, Turkey, Israel, and even Hong Kong and Australia to share their experience and discuss latest achievements. Altogether there were 70 participants from as many as 15 countries, including Poland. The scientific program was arranged in seven sessions: "Site-directed spin labeling", "New spin traps and spin labels in biomedical applications", "New developments in EPR methodology". "Advances in *in vivo* EPR research", "EPR studies of structure and dynamics of protein and membranes", "Nitric oxide and peroxynitrite", "Oxidative stress in biology and photobiology". There were plenary and invited lectures, and oral presentations and discussions.

The 5<sup>th</sup> Workshop was one among many events of the Jubilee year of the Jagiellonian University, commemorating the rebirth of the University 600 year ago. The Founders of our University wished the University to be a place of intelectual creativity and stimulating thoughts and ideas open to scholars and students from all over Europe. We believe that the Krakow EPR Workshops are in line with this tradition.

On behalf of the Organizing and Scientific Committee of the 5<sup>th</sup> Workshop on Applications of EPR in Biology and Medicine, I wish to express our sincere gratitude to the distinguished guests and all the participants for making this Workshop a very successful scientific meeting. Our special thanks go to our colleagues from US, who decided to come here as planned, only two weeks after tragic events of September 11<sup>th</sup>.

The Organizing Committee of the 5<sup>th</sup> Workshop gratefully acknowledges the support of European Union (5<sup>th</sup> Framework Programme; Support for Centres of Excellence contract no. ICA1-CT-2000-70012); Polish Committee of Scientific Research (KBN, SPUB-M, 3018), Medical College of Wisconsin Free Radical Research Center (Milwaukee, WI, USA) and The Jan Zurzycki Institute of Molecular Biology and Biotechnology.

We hope to see you all again in 2004!

Professor Tadeusz Sarna Chairman of the Organizing Committee