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# BIOELECTROMAGNETICS

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**Editor's Note: The Path Forward**

Several BEMS members have expressed concern about the changes that are happening within The Bioelectromagnetics Society after reading the last issue of the newsletter (BEMS NL 222). We recognize that, as one person put it:

"BEMS is a membership supported organization devoted to the advancement of bioelectromagnetics science and the promotion of scholarly communication through its annual meetings and the publication of the Bioelectromagnetics journal. To the extent that there are BEMS Society issues that concern its members and that clarification may be needed for its members, I would suggest doing it in a reasoned way for accountability, transparency and communication. Appropriately communicating the process involved in this should go a long way toward removing any unease about what has transpired and about going forward as a Society."

The Board of Directors meets February 17-18 in Lyon, France to consider the way forward. The next newsletter will contain information from that meeting so that you, the members, know what is planned.

It is also incumbent on the members themselves to take an active role in moving BEMS forward - in the days ahead there are likely to be options presented to the membership for consideration about the way we do business. These will require your careful attention. In the meantime, let's make sure we have an active dialog so that we can find appropriate solutions that sustain us. Send your ideas, thoughts, concerns, etc. to [news@bems.org](mailto:news@bems.org) or to [president@bems.org](mailto:president@bems.org). We will continue the dialog in the next newsletter.

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**NL 223: President's Letter**

Dear Members of the Bioelectromagnetics Society,

I hope you all had a good start into 2012. I hope it will be a successful year for The Bioelectromagnetics Society, with a reversal in decline of membership, a great scientific annual meeting in Brisbane, and consolidation of our finances. For the latter, the Board will continue to take a look at our expenses and at the same time will try to make sure that the money we spend is to the benefit of the science and to our members. For the annual meeting, we have a very active local organizing committee led by David Black and Andrew Wood. Please remember that the deadline for abstract submission in early February! This enables the Organizing Committee to set up a scientifically strong meeting by allowing adequate time to review the proposed content. For membership: I like to encourage everyone to be active – please promote the Society whenever appropriate, irrespective of whether you are student, senior or emeritus. It is especially important that each member communicate the advantages of joining The Bioelectromagnetics Society whenever and wherever possible.

The next upcoming major event for The Society is the Winter meeting of the Board of Directors: this will be held in mid February in Lyon, France, with the International Agency for Research on Cancer (IARC) hosting the meeting. We took the opportunity to meet in Europe so that we could invite the European Bioelectromagnetics Association (EBEA) to hold their meeting simultaneously at IARC and they have agreed. This will not only allow the presidents of each Society to attend the other Society's Board meetings as guests, but also enables us to use the day between the two Board meetings for meetings of the joint task forces focused on strengthening the collaboration between the Societies (BEMS-EBEA task force) and on planning the next joint meeting in 2013 in Thessaloniki, Greece (BioEM 2013 planning committee). As an additional satellite meeting we have a small BEMS task force mainly consisting of the members of the Management Committee (David Black, Jeff Carson, Phil Chadwick, Joachim Schüz, Jonna Wilen, Andrew Wood) to take a look at the constitution and by-laws to make proposals for modernization that will then be discussed at the two-day Board meeting on February 17 and 18. We have expanded the Board meeting to allow ample time to discuss the long term future of management of the Society, organization of the annual meetings, and the preparation for the Brisbane meeting. Then, at the annual business meeting in Brisbane, we want to discuss with all members of BEMS our suggestions for modernization of the Society.

A major issue for modernization is to allow the use of new technologies for Board meetings. Historically decision making has been mainly restricted to face to face meetings, and we think we can do this electronically in the future so that our efforts are more cost effective. With such a change, Board meetings can be held more

frequently and decisions can be made faster with more efficient response to any unforeseen challenges. Also the size and composition of the Board, the terms of officers, and the tasks of the various committees have to be discussed with an eye towards increasing efficiency. We don't yet know if major changes will be suggested, but the present Board feels that at a minimum, a wide range of functions and procedures need to be re-visited to see how we might make better use of resources and get the job done more efficiently. This applies also to our present slate of membership categories with their rights and duties: we want to make sure The Society is well-served by the way we structure our membership. Each member is invited to make suggestions for input for the task force; please do so by directly contacting our Secretary who collects the information (secretary@bems.org).

Again, I wish us all a very successful year and hope that many of you have new scientific insights to share and submit their abstracts for the annual meeting in Brisbane,

Joachim Schüz

#### **Late breaking news: Abstract deadline for Brisbane meeting extended!**

Andrew Wood, Chair of the Technical Program Committee for this year's Annual Meeting in Brisbane, Australia, announced recently that "in response to a number of requests, the organisers of 34BEMS have agreed to **extend the deadline for abstracts submissions to the end of Monday February 13th (Washington DC time)**. Notification of acceptance (or otherwise) of submissions will occur as soon as possible after this date.

"

#### **Recent Publications of Note**

##### **The relationship between residential magnetic fields and contact voltage: a pooled analysis.**

*Kavet R, Hooper C, Buffler P, Does M.*

*Radiat Res. 176, 807-15 (2011)*

It has been suggested that residential exposure to contact currents may be more directly associated with the potential for an increased risk of leukemia in childhood than magnetic fields. Kavet and colleagues reviewed data from the Northern California Childhood Leukemia Study to examine whether contact current might be a factor responsible for epidemiological evidence of a positive association between environmental magnetic fields and the incidence of childhood leukemia. They found a sufficient association between measurements of the average magnetic field and measurements of the voltage between the bath downspout and drain (as a measure of contact currents experienced by children in that environment) to support the possibility that contact current could be responsible for, or confound, the association of childhood leukemia with magnetic fields.

##### **Electromagnetic fields as first messenger in biological signaling: Application to calmodulin-dependent signaling in tissue repair**

*Arthur Pilla, Robert Fitzsimmons, David Muehsam, June Wu, Christine Rohde, Diana Casper*

*Biochimica et Biophysica Acta 1810, 1236–1245(2011)*

This study proposes that an EMF can act as a first messenger in the calmodulin-dependent signaling pathways that orchestrate the release of cytokines and growth factors in normal cellular responses to physical and/or chemical insults. This study presents a mechanism consistent with the hypothesis that a non-thermal EMF signal can be configured a priori to act as a first messenger in calmodulin-dependent signaling pathways that include nitric oxide and cyclic nucleotides relevant to tissue growth, repair and maintenance. The predictions of the proposed model suggest significant possibilities for configuration of non-thermal EMF signals for clinical and wellness applications that can reach far beyond fracture repair and wound healing.

##### **Effects of pulsed electromagnetic fields on interleukin-1 beta and postoperative pain: a double-blind, placebo-controlled, pilot study in breast reduction patients.**

*Rohde C, Chiang A, Adipoju O, Casper D, Pilla AA.*

*Plast Reconstr Surg. 125(6):1620-9 (2010)*

This work demonstrates that pulsed electromagnetic field therapy significantly reduced postoperative pain and narcotic use in the immediate postoperative period. A subsequent comment in the same journal by Dennis C. Hammond, M.D. of the Center for Breast and Body Contouring In Grand Rapids, Michigan notes that "these findings are important, as this treatment modality could potentially play a more significant role for other types of procedures where pain and inflammation would be expected to [be] more severe..."

#### **ARIMMORA – Advanced Research on Interaction Mechanisms of electroMagnetic exposures with Organisms for Risk Assessment**

On October 1, 2011 a new EU-funded collaborative project was launched with the ambitious goal of determining the existence or absence of a causal relationship between extremely low frequency magnetic field (ELF MF) exposure and childhood leukemia. The ARIMMORA (Advanced Research on Interaction Mechanisms of electroMagnetic exposures with Organisms for Risk Assessment) consortium consists of ten research groups with expertise ranging from engineering to biology (see Consortium list, below). This three-year project, which includes scientists and engineers from Switzerland, Germany, Spain, Israel, France and Italy, is coordinated by Niels Kuster of the IT'IS Foundation in Switzerland.

Identification of an interaction mechanism that could underlie the possible epidemiologic correlation between exposure to ELF MF levels far below established safety limits and childhood leukemia is one of the big unresolved issues in bioelectromagnetics.

The ARIMMORA project aims to contribute to settling the conflicting conclusions that can be drawn. The levels and temporal patterns of ELF-MF exposures of children in their daily lives and normal activities including local sources will be studied to improve understanding of the epidemiological findings. The biological impact of ELF-MF exposure will be investigated in four processes: 1) epigenetic dynamics associated with hematopoietic cell lineage commitment and differentiation; epigenetic signatures will be monitored genome-wide, and mechanisms underlying eventual “misprogramming” will be addressed in gene promoter models; 2) the alteration of signaling processes in cells; 3) the induction of possible cytotoxic effects on CD8-positive T-cells; and 4) the genesis and evolution of childhood leukemia in advanced genetically-modified animal models. Furthermore, advanced biophysical models will be developed. In a final phase, results of this and other projects will be combined and a risk assessment will be performed by adapting and applying the procedures outlined by the International Agency for Research on Cancer IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. In addition of addressing this open EMF issue, the research is also expected to provide insight into the etiology and cellular progression of childhood leukemia in general and open the door to prevention and treatment.

This project is exactly in line with Niels’ call for more research centered on interaction mechanisms in contrast to past emphasis on hazard research (BEMS Newsletter 217, Nov/Dec 2010). ARIMMORA and childhood leukemia will also be intensively discussed during the workshop in Monte Verita scheduled this fall ([www.itis.ethz.ch/mv-2](http://www.itis.ethz.ch/mv-2)) that will exclusively focus on research techniques that can shed light on EMF interaction mechanisms (see related article in this newsletter).

For more detailed information, please visit [www.arimmora-fp7.eu](http://www.arimmora-fp7.eu)

ARIMMORA Consortium (pictured below at kickoff meeting in Brussels, 2011)

Prof. **Niels Kuster**, Coordinator  
Foundation for Research on Information Technologies in Society, Switzerland

Prof. **Primo Schär**  
University of Basel, Switzerland

Prof. **Martin Röösli**  
Swiss Tropical and Public Health Institute, Switzerland

Dr. **Rony Seger**  
Weizmann Institute of Science, Israel

Prof. **Clemens Dasenbrock**  
Fraunhofer-Institute of Toxicology and Experimental Medicine, Germany

Dr. **Maren Fedrowitz**  
University of Veterinary Medicine Hannover, Foundation, Germany

Dr. **Katja Pokovic**  
Schmid & Partner Engineering AG, Switzerland

Dr. **César Cobaleda**  
Agencia Estatal Consejo Superior de Investigaciones Científicas  
Spain

Dr. **Joachim Schüz**  
Centre International de Recherche sur le Cancer, France

Dr. **Paolo Ravazzani**  
Consiglio Nazionale delle Ricerche, Italy

#### External Advisory Board

Dr. Gunde Ziegelberger, Germany  
Prof. Yngve Hamnerius, Sweden  
Prof. Izidore S. Lossos, USA

#### Project Management and Contact

Dr. Iris Szankowski, IT'IS Foundation  
Zeughausstrasse 43, 8004 Zurich, Switzerland  
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### Ziskin Portrait Presented at Temple University

On November 17, 2011, a portrait of recent d'Arsonval award recipient, Marvin Ziskin, MD, Professor of Radiology and Medical Physics, was presented to Temple University School of Medicine.

Dedication remarks were made at the ceremony by:

- Charles Jungreis, M.D.
- Leon Malmud, M.D.
- Alexander Radziewsky, M.D., Ph.D.
- Leah Zoole Ziskin, M.S., M.D.
- Joseph Routon, artist
- Marvin C. Ziskin, M.S.Bm.E., M.D.

#### About Marvin C. Ziskin, MD

Internationally recognized in radiology and medical physics, Marvin C. Ziskin, M.S.Bm.E., M.D., received his medical degree from Temple University in 1962, and an M.S. in Biomedical Engineering from Drexel University in 1965. He joined the faculty of Temple University with appointments in radiology and medical physics in 1968. Today he is full professor of Radiology and Medical Physics, and serves also as Director of Temple University's Center for Biomedical Physics. A forerunner in ultrasound research for the past 46 years, Dr. Ziskin helped to pioneer 2-D ultrasonography as a diagnostic modality. He is author or coauthor of more than 250 scientific publications and co-editor of seven books. Among the many prestigious awards he has accrued throughout his career are two AIUM Presidential Recognition Awards (1979 and 1986); the William J. Fry Memorial Lecture Award (1993); and the D'Arsonval Award for outstanding lifetime achievement in advancing bioelectromagnetics, the highest award offered

by the Bioelectromagnetics Society (2011). He was the President of the American Institute of Ultrasound in Medicine (1982-84), and was the President of the World Federation for Ultrasound in Medicine and Biology (2003-2006). The latter scientific organization is composed of over 60,000 members.

#### About the Artist, Joseph Routon

A third-generation painter from Paris, Tennessee, Joseph Routon studied portraiture in New York City at the Art Students League and the National Academy of Design, where he was awarded the Ralph Weiler Prize. He was elected to artist membership in the Salmagundi Club in New York City. Additional study was in Philadelphia at the Pennsylvania Academy of the Fine Arts (PAFA), where he served on the Board of Directors of the PAFA Fellowship and as editor of the Academy's alumni magazine. In addition to his art studies, he has degrees in music and has had photographs appear on the cover of several leading publications.

### New workshop: Applied Bioelectrics

The Frank Reidy Research Center for Bioelectrics of Old Dominion University is holding an International Scientific Workshop on Fundamental and Applied Bioelectrics from July 23rd-27th 2012.

The workshop will be a series of lectures from leading researchers in the field of Bioelectrics covering fundamentals of pulsed electric fields, with an emphasis on ultra-short pulsed electric fields, and their effects on cells and tissues. These pulses permeabilize the plasma membrane of the cell as well as the membranes of internal structures. Participants will leave appreciating differences between micro, nano and pico-second pulse effects on cells and tissues. Other important topics include plasma generation physics and applications, heart electrophysiology, picosecond physics, and modeling of pulsed electric fields on cell membranes. Hands-on laboratory work will cover use and applications of nanosecond pulses, cellular effects, platelet gel activation and its importance in wound healing, plasma sterilization, and real-time changes in cells following application of ultra-short pulsed electric fields. The Workshop is open to all researchers (students, post-docs, and investigators) interested in the field of Bioelectrics.

Registration deadline is May 15th, 2012. The registration fee of \$350 covers all Workshop activities, a welcome social and an afternoon social event. Registration and Workshop information, including invited speakers and schedule, can be found at <http://www.odu.edu/enr/bioelectrics/workshop2012.html>

For more detail, please contact

Conference organizer Mike Stacey (MStacey@odu.edu )

or

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### **EMF Health Risk Research: Lessons Learned and Recommendations for the Future – Seven Years Later**

The IT'IS Foundation for Research on Information Technologies in Society, in collaboration with the Swiss Federal Institute of Technology and the Centro Stefano Franscini, will be holding its second workshop on electromagnetic fields and health risk research on October 21-26, 2012 in the magnificent location of Monte Verità, in Ascona Switzerland.

The first workshop, held in November 2005, brought together prominent researchers in bioelectromagnetics, representatives of national and international research programs, and representatives of health risk review panels. The objectives were to identify shortcomings of past research and remaining gaps, and to recommend future research directions. Unlike other scientific meetings, the number of presentations was limited to the most controversial topics and results, and the participating experts were involved in extensive discussions instead of just making presentations. The outcomes of this first workshop were greatly influential and paved the way for improved research.

Seven years later, the time has come to reconvene. The main focus of the upcoming four-day roundtable will be on interaction mechanisms between weak electromagnetic fields and human tissues. Without a better understanding of these mechanisms, assessing the risks and the potential benefits associated with human exposure to EMFs will remain difficult, and extrapolating current results to novel emerging technologies and different frequency ranges will remain largely impossible. As in 2005, this workshop will gather the experts in the fields of EMF exposure and health hazards, and will prioritize discussions.

The program will start with one day of short reviews on biosensors, established EMF-related risks of childhood leukemia, and environmental exposures. The remaining three days will consist of brief presentations followed by extensive discussions on the controversial effects of EMF on genome stability, cellular communication, neuronal systems, and neuronal degeneration. The workshop will also include the final FP7 SEAWIND project presentation and will end with discussions on knowledge gaps and on research strategies for addressing them.

PhD and Post-doctoral fellows are particularly welcome! However, the number of participants is limited to 100. Please contact the workshop organizers at mvinfo@itis.ethz.ch promptly if you are interested in participating. For more information, please visit [www.itis.ethz.ch/mv-2/](http://www.itis.ethz.ch/mv-2/).

### **223: Calendar**

#### 223 Calendar

- Nominations are open for the 2012 election until February 7, 2012. The Election will be open April 2 – 30, 2012 for all voting members of BEMS.
- Membership dues are due now, payable on the BEMS website ([www.bems.org](http://www.bems.org)).

#### Meetings

### **Childhood Cancer 2012**

- Date: 24 -26 April 2012
- Location: Church House Conference Centre, Westminster, UK
- Website: <http://www.childhoodcancer2012.org.uk/>

### **The Gordon Research Conference on Bioelectrochemistry**

*NOTE: This is NOT the same as the regular BES meeting.*

- Date: 1-6 July 2012
- Location: Il Ciocco Hotel and Resort near Lucca, Italy.

**Applications for this meeting must be submitted by June 3, 2012. Please apply early, as some meetings become oversubscribed (full) before this deadline.**

#### Notes:

*Prior to the conference, on June 30 - July 1, there will be a tutorial for graduate students and workers new to the area of Bioelectrochemistry.*

*The 2012 Gordon Research Conference on Bioelectrochemistry will present cutting-edge research on the body electric: understanding the role of endogenous electric fields in development, regeneration and cancer and utilizing electric fields to treat diseases. The Conference will feature a wide range of topics, such as: the role of voltage gradients and endogenous electric fields in development and regeneration; sensing electric fields/voltage; the use of endogenous EFs/ionic flow and EF pulses in the detection and treatment of cancer/diseases; modeling/techniques and biosensors for the in vivo study of bioelectricity; biological responses to nanosecond and picosecond pulses; electroporation and the brain - responses and imaging; DNA electroporation and immunity - modulation of the immune response by and in response to electroporation; the cell biology of gene transfer - during and*

after the pulse and the final hot topics session.

Invited speakers are experts in the field of bioelectrochemistry and the related specialties of biophysics, cell biology, developmental biology, electrochemistry, bioelectromagnetics, and medicine as they relate to the effects of weak and strong electric fields on membranes, cells, and tissues. The Conference will bring together a collection of investigators who are at the forefront of their field, and will provide opportunities for junior scientists and graduate students to present their work at both the GRS and the GRC in poster format and exchange ideas with leaders in the field. Some poster presenters will be selected for short talks within the GRS or the GRC. The collegial atmosphere of this Conference, with programmed discussion sessions as well as opportunities for informal gatherings in the afternoons and evenings, provides an avenue for scientists from different disciplines to brainstorm and promotes cross-disciplinary collaborations in the various research areas represented.

For more information contact Dr. Christine Pullar at [cp161@leicester.ac.uk](mailto:cp161@leicester.ac.uk)

#### **International Scientific Workshop on Fundamental and Applied Bioelectrics**

- Date: 23 – 27 July 2012
- Location: Norfolk, VA (USA)
- Website: <http://www.odu.edu/engr/bioelectrics/workshop2012.html>

Additional details are in this newsletter.

#### **11th International Congress of Hyperthermic Oncology (IHO) & 29th Japanese Congress of Thermal Medicine (JCTM)**

- Date: 28 – 31 August 2012
- Location: Kyoto, Japan
- Website: <http://www.jsho.jp/images/stories/info/2012taikai-eng.pdf>

#### **7th International Workshop on Biological Effects of Electromagnetic Fields**

- Date: 8 - 12 October 2012
- Location: Grand Hotel Excelsior, Valletta, Malta
- Website: <http://www.um.edu.mt/science/physics/electromagnetics/7IWSBEEMF>

#### **EMF Health Risk Research: Lessons Learned and Recommendations for the Future – Seven Years Later**

- Date: 21 - 26 October 2012
- Location: Monte Verità, in Ascona Switzerland.

Additional details in this newsletter.

#### **Electroporation based Technologies and Treatments**

- Date: 18-24 November 2012
- Location: Ljubljana, Slovenia
- Website <http://www.ebtt.org/>

Notes:

For several years beginning in 2003 the University of Ljubljana has offered an interdisciplinary postgraduate course on electroporation-based technologies and treatments. The course for 2012 is being prepared by six of the leading international experts in the field:

- Lluís M. Mir, CNRS, Institut Gustave Roussy, Villejuif, France
- Eberhard Neumann, University of Bielefeld, Germany
- Véronique Prétat, Catholic University of Louvain, Belgium
- Gregor Serša, Institute of Oncology, University of Ljubljana, Slovenia
- Justin Teissié, CNRS, Institute of Pharmacology and Structural Biology, Toulouse, France
- P. Thomas Vernier, University of Southern California, USA
- Damijan Miklavčič, University of Ljubljana, Slovenia.

#### **FUTURE MEETINGS OF THE BIOELECTROMAGNETICS SOCIETY:**

- 17 - 22 June 2012: Brisbane Convention & Exhibition Centre, Brisbane, Australia
- (dates TBD) BioEM 2013: Joint meeting with EBEM in Thessaloniki, Greece

**About NL 223**

The Bioelectromagnetics Society newsletter is published and distributed to all members of the Society. Institutions and libraries may subscribe to the newsletter at an annual cost of \$115(USD).

The newsletter serves as a forum for ideas and discussion of issues related to bioelectromagnetics research. Contributions may include news items, meeting reports, short notes on research, book reviews, and relevant items of historical or other interest. All submissions must be signed. While it is understood that contributions by individual authors reflect the views of the contributor, the editor may require that contributing writers submit a statement of affiliation and/or disclosure of possible conflict of interest at the time an article is submitted for consideration. Advertisements included in the newsletter are not to be considered endorsed by the Society.

Recently (June 2011) The Bioelectromagnetics Society agreed to change the publication dates for the newsletter to Feb-Mar, Apr-May, June-July, Aug-Sep, Oct-Nov, Dec-Jan.

To submit items for the newsletter, please send electronic files to  
news@bems.org  
or  
bemsnewsletter@gmail.com  
Tel: 415-937-1477.

BEMS newsletter editor, Janie Page, is an independent consultant in Oakland, CA.

For other Society business or information, please contact Joachim Schuz at schuz@iarc.fr

BEMS website: [www.bems.org](http://www.bems.org)

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