



COST EMF-MED

European network for innovative uses of EMFs
in biomedical applications

4th Management Committee Meeting (MCM)



**Workshop on Verification, Validation and Uncertainty Assessment
in Medical EMF Applications**



4th Working Group Meetings (WGMs)



**Mini-Training workshop on Microwave Medical Imaging:
state of the art; challenges related to dielectric properties of tissues**

Prague, 16-18 November 2015

Final Program (ver. 14/11/2015)

Meeting Venue:

Czech Technical University in Prague, Czech Republic

16-17 November:
Faculty of Electrical Engineering
Technicka 1902/2, Prague 6
Czech Republic

18 November:
Masarykova Kolej Congress Center
Thakurova 550/1, Prague 6
Czech Republic

Local organiser:

Prof. Dr. Jan Vrba
e-mail: vrba@fel.cvut.cz

Timetable

<u>Monday 16/11/2015</u>	<u>Tuesday 17/11/2015</u>		<u>Wednesday 18/11/2015</u>
		08:15 – 09:15 SG meeting	
	09:00 – 09:30 Registration		09:00 – 18:00
	09:30 – 09:40 Welcome address		Workshop on Verification, Validation and Uncertainty Assessment in Medical EMF Applications
	09:40 – 10:45 MCM		
	10:45 – 11:15 Coffee break		10:40 – 11:10 Coffee break
	11:15 – 12:30 MCM		Workshop
13:00 – 15:00 Visit to Bioelectrodynamics Research Team labs	12:30 – 14:00 Lunch break		12:20 – 13:50 Lunch break
	14:00 – 15:15 STSM presentations		Workshop
	15:15 – 15:45 Coffee break		15:20 – 15:50 Coffee break
16:00 – 17:00 Welcome Coffee	15:45 – 18:00		Workshop
17:00 – 19:10 Mini-training	WG1M	Joint WG2 & WG3M	
		WG2M	
		WG3M	
	Social dinner		

Monday 16/11/2015**13:00 – 15:00 Visit to Bioelectrodynamics Research Team labs at the Institute of Photonics and Electronics**

Venue (different from the main venue): Institute of Photonics and Electronics, Chaberska 57, Praha 8

Note: The visit is subject to registration according to e-mail instructions. For more info please contact Dr. Ondrej Kucera at ondrej.kucera@seznam.cz.

- 13:00 Get together
- 13:05 Introduction of the Institute and the Bioelectrodynamics Research Team
- 13:45 Visit to the lab of photonic bio-signals
- 13:55 Visit to the RF development lab (dielectric spectroscopy)
- 14:05 Visit to the lab of optical biosensors
- 14:25 Visit to the Nanotechnology Laboratory
- 15:00 End

Main venue (Faculty of Electrical Engineering):**16:00 – 17:00 Welcome Coffee / Registration****17:00 – 17:10 Welcome address from:**

- Dean of the Faculty of Electrical Engineering, Prof. Pavel Ripka, PhD.
- Deputy-Head of Dept. of Electromagnetic Field, Prof. Stanislav Zvánovec, PhD.

17:10 – 19:10 Mini-Training Workshop: Microwave medical imaging - state of the art; challenges related to dielectric properties of tissues

Invited speakers and workshop chairs: Raquel Conceicao¹ and Martin O'Halloran²

¹Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências, Universidade de Lisboa, Portugal / Institute of Biomedical Engineering, University of Oxford, United Kingdom

²National University of Ireland, Galway

Tuesday 17/11/2015 - Faculty of Electrical Engineering

09:00 – 09:30 Registration

09:30 – 09:40 Opening

Welcome address from the Local Organizer Prof. Jan Vrba, and Action Chair

09:40 – 10:45 Management Committee Meeting

Chair: Antonio Šarolić (Action Chair)

10:45 – 11:15 Coffee break

11:15 – 12:30 Management Committee Meeting

12:30 – 14:00 Lunch break

14:00 – 15:15 STSM presentations

Chair: Stavros Koulouridis (ESR/STSM/Training Coordinator)

Tentative List (**Title**, Grantee, Host), underlined: the speaker

Pre-market assessment of EMF interactions and applications: a case study on electroporation, Pecchia Leandro - University of Warwick (UK), Damijan Miklavcic - University of Ljubljana

Nanosecond pulsed electric fields on liposomes for potential drug delivery applications, Elena del Vale - Sapienza University of Rome (IT), Luis M. Mir - Institut Gustave-Roussy (FR)

Analysis of EEG and MEG signals using Empirical Decomposition Phase Locking method, Pawel Stepień - Institute of Biocybernetics and Biomedical Engineering (PL), Andreas Ioannides - AAI Scientific Cultural Services Ltd. (CY)

Neuroprotective and neuroregenerative effects of the electrical stimulation of long term amputees. Data analysis and design of research project, Fivos Panetsos - Universidad Complutense de Madrid (ES), Michele Papa - Seconda Università di Napoli (IT)

Novel approach to bio-electromagnetic effects measurements and quantification of metabolic activity, Yan Barabas - University of Zilina (SK), Michal Cifra - Academy of Sciences of the Czech Republic (CZ)

Mechanistic Modeling, Optimization and Risk Assessment of Electro-Muscular Incapacitation Devices (EMD), Nikola Djuric - Faculty of Technical Sciences, University of Novi Sad (RS), Niels Kuster - IT'IS Foundation (CH)

Experimental evaluation of a microwave sensor performance on pneumothorax diagnosis, Maria Christopoulou - University of Patras (GR), Niels Kuster - IT'IS Foundation (CH). Talk will be given by Stavros Koulouridis - University of Patras (GR)

15:15 – 15:45 Coffee break

15:45 – 17:45**WG1 Meeting**

Chair: Gerard Van Rhoon (WG1 Leader)

15.45 – 16:30 A. Kukielka, MD, Centrum Radioterapii Amethyst, Kraków (Poland):

HDR brachytherapy combined with interstitial hyperthermia for prostate cancer

16.30 – 16:55 J. Vrba (Czech Republic):

Hyperthermia in the Czech Republic – short history and present technical research

16.55 – 17:15 L. Vannucci, MD (Czech Republic):

Theranostics – Nanoconstructs for tumor microenvironment and tumor cell targeting

17.15 – 17:35 D. Vrba (Czech Republic):

Feasibility study of metamaterial based applicators for regional microwave hyperthermia

17.35 – 17:45 General Discussion

15:45 – 16:45**Joint WG2 & WG3 Meeting**

Chairs: Lluís M. Mir (ad interim WG2 Leader) & Niels Kuster (WG3 Leader)

15.45 – 16:00 Eugenius Kaniusas, Stefan Kampusch (Austria):

Vagal nerve stimulation - progress and plans

16.00 – 16:15 Wout Joseph (Belgium):

Neural Simulation for Auricular Vagus Nerve Stimulation

16:15 – 16:30 Sandra Medrano Garcia (Spain):

Clinical Applications of Auricular Vagus Nerve Stimulation: cervical dystonia, diabetic wounds, blood perfusión and stroke

16:30 – 16:45 Fivos Panetsos (Spain):

Interfacing nervous system and immunological system: nucleus tractus solitarii

16:45 – 17:55**WG2 Meeting**

Chair: Lluís M. Mir (ad interim WG2 Leader)

16.45 – 17:00 Lyubina Vesselinova (Bulgaria):

Biological Respondents to the Therapeutical Electromagnetic Fields Stimuli

17.00 – 17:15 Adnan Kaya (Turkey):

The Treatment Effect of Electromagnetic Fields (EMF) on the Cell Behavior during In Vitro Wound Healing

17:15 – 17:35 Jan Cuppen (The Netherlands):

Neutrophils, autoimmune reactions and EMF

17:35 – 17:55 Jean François Collard (Belgium):

Cell mechanisms involved after ELF stimulation

16:45 – 17:55**WG3 Meeting**

Chair: Niels Kuster (WG3 Leader)

16:50 - 17:05 Pawel Bienkowski (Poland):

The Crawford Cell in Bioelectromagnetic Studies

17:05 - 17:20 Pawel Cala (Poland):

Cavity Antenna Used for Biomedical Research

17:20 - 17:35 Zengin Reyhan (Turkey):

Lorentz Force Electrical Impedance Tomography using Magnetic Measurements

17:35 - 17:50: General Discussion

Wednesday 18/11/2015 - Masarykova Kolej Congress Center

**COST EMF-MED Workshop on Verification, Validation and Uncertainty
Assessment in Medical EMF Applications**

(Chair: Prof. Niels Kuster, *IT'IS Foundation*)

Time	Presenter	Title
09:00	A. Šarolić (COST EMF-MED Chair)	Welcome
09:05	N. Kuster (Workshop Chair)	Short Introduction of the Program
Session I.		
09:10	N. Kuster	Setting the Stage for <i>In Silico</i> to Bedside: Basic V&V&QA Requirements
09:20	J. Wiart (invited speaker via t-con)	Uncertainty Assessment with Polynomial Chaos Decomposition
09:50	E. Neufeld (via t-con)	Assessing and Demonstrating the Credibility of Computational Medical Device Evaluation: The Need for Benchmarks
10:20	J. Karpowicz	Multi-Center Collaboration Aimed in Validation and Verification of Evaluation Protocols and Virtual Models Involved in Analysis of Electromagnetic Field Influence Covering the Limb Currents
10:40	Coffee/Tea	
Session II.		
11:10	E. Zastrow (invited speaker)	V&V Applied for Evaluation of MRI Safe Implants
11:40	V. Lopresto	Tissue Properties Variations in Multi-Physics Predictive Models for Treatment Planning of Microwave Thermal Ablation
12:00	P. Zradziński	The Role of Human Body Virtual Phantom Structure and Dielectric Properties in the Evaluation of Electromagnetic Influence on the User of Bone Conduction Hearing Prosthesis
12:20	Lunch	
Session III.		
13:50	V. Monebhurrin (invited speaker)	Numerical Model Calibration Using Experimental Data
14:20	V. De Santis	Verification of Computational Anatomical Models: The Role of the Skin Modeling in LF Applications
14:40	T. Drizdal	Software and Hardware Stability Testing in Hyperthermia Treatment Planning
15:00	D. A. M. Iero	Optimal Power Focusing in Microwave Hyperthermia: A Robustness Assessment
15:20	Coffee/Tea	
Session IV.		
15:50	W. Kainz (invited speaker via t-con)	V&V Requirements in the Regulatory Context
16:20	K. El Khamlichi Drissi	High-Resolution Method for The Analysis of Electrophysiological Activities
16:40	D. Poljak	Stochastic-Deterministic Approach to the Brain and Eye Dosimetry
17:00	G. Schooneveldt	Clinical Validation of a Thermophysical Bladder Model to Improve Hyperthermia Treatment Planning in the Pelvic Region
17:20	All	General Discussion
18:00	Closure	



**Draft Agenda
Management Committee Meeting**

COST Action no. BM1309

Action Title: European network for innovative uses of EMFs in biomedical applications (EMF-MED)

Prague, Czech Republic, 17/11/2015

1. Welcome to participants
2. Adoption of agenda
3. Approval of minutes and matters arising of last meeting
4. Update from the Action Chair
 - a. Status of Action, including participating countries
 - b. Action budget status
5. Update from the Grant Holder
6. Update from the COST Association
7. Update from the ESTC (Early Stage Researcher/STSM/Training School Coordinator)
 - a. Report on the completed Training Schools (Galway, Coventry, Torino)
 - b. Report on STSM grants
 - c. Promotion of gender balance and of Early Stage Researchers (ESR)
8. Follow-up of MoU objectives
 - a. Progress report of working groups
 - b. Election of WG2 Leader
9. Scientific planning
 - a. Scientific strategy
 - b. Action Budget Planning
 - c. Long-term planning (including anticipated locations and dates of future activities)
 - d. Dissemination planning (publications and outreach activities)
 - BioEM 2016, Erice 2016 Training school, activities in the 3rd Grant Period
10. Requests for new members
11. Non-COST applications to the Action
12. AOB
13. Location and date of next meeting
14. Summary of MC decisions
15. Closing