



NRP 57 Publications

(Status as of 30 September 2011; the list will be continuously updated)

Project 4057-113552: Determination of the exposure of the fetus to electromagnetic fields in an uncontrolled environment

Dr. Nicolas Chavannes

Christ A., Bühlmann B., Zefferer M., Chavannes N., Kuster N., Exposure of the fetus to electromagnetic fields in uncontrolled environments. Proceedings of the 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 14–18, 2010, Seoul, Korea, 2010.

Christ A., Bühlmann B., Zefferer M., Murbach M., Kuster N., Current density and SAR induced in the fetus under controlled exposure conditions. Proceedings and Programme of the EMF Bordeaux Event (EBEA, COST & URSI 2010), May 26–28, 2010, Bordeaux, France, 2010.

Chavannes N., Christ A., Bühlmann B., Djafarzadeh R., Gosselin M.-C., Zefferer M., Kuster N., Assessment of the exposure of the fetus to electromagnetic fields in uncontrolled environments. Abstracts of the NRP 57 Workshop: Non-Ionising Radiation - Health and Environment, 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), June 14, Davos, Switzerland, 2009.

Project 4057-113591: Cumulative exposure in time and frequency domains of the central nervous system

Prof. Dr. Niels Kuster

Gosselin M.-C., Crespo-Valero P., Kuehn S., Kuster N., Implementation and Experimental Validation of a Brain-Region Specific Exposure Estimation in SAR Measurement Systems, Proceedings of the 33rd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 12–17, 2011, Halifax, Canada, 2011.

Gosselin M.-C., Kühn S., Crespo-Valero P., Cherubini E., Zefferer M., Christ A., and Kuster N., Estimation of Head Tissue-Specific Exposure from Mobile Phones Based on Measurements in the Homogeneous SAM Head, Bioelectromagnetics, Volume 32, Issue 6, pages 493–505, September 2011

Crespo-Valero P., Christopoulou M., Zefferer M., Christ A., Achermann P., Nikita K. S., Kuster N., Novel methodology to characterize electromagnetic exposure of the brain. Physics in Medicine and Biology, 56, 2011, 383-396.

Gosselin M.-C., Kühn S., Kuster N., Power control of multi-band, multi-system mobile phones in real networks. Proceedings of the 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 14–18, 2010, Seoul, Korea, 2010.

Djafarzadeh R., Crespo-Valero P., Zefferer M., Kuehn S., Christ A., Kuster N., Organ and CNStissue region specific evaluation of the time-averaged far-field exposure in various human body models. Abstract Collection of BioEM 2009 Davos, the Joint Meeting of the



Bioelectromagnetics Society and the European BioElectromagnetics Association, June 14–19, Davos, Switzerland, 2009.

Gosselin M.-C., Zefferer M., Valero P. C., Christ A., Kuehn S., Kuster N., Correlation of the exposure of mobile phones assessed in SAM by applying standard procedures with the SAR in anatomical human heads. Abstract Collection of BioEM 2009 Davos, the Joint Meeting of the Bioelectromagnetics Society and the European BioElectromagnetics Association, June 14–19, Davos, Switzerland, 2009.

Kühn S., Cabot E., Christ A., Capstick M., Kuster N., Assessment of the radio-frequency electromagnetic fields induced in the human body from mobile phones used with hands-free kits. *Physics in Medicine and Biology*, 54, 2009, 5493-5508.

Kühn S., EMF Risk Assessment: Exposure Assessment and Compliance Testing in Complex Environments. Phd-thesis, Swiss Federal Institute of Technology, Zurich, Switzerland, Hartung-Gorre Verlag Konstanz, September 2009. PhD ETH No. 18637.

Kühn S., Gosselin M.-C., Cabot E., Djafarzadeh R., Crespo-Valero P., Christ A., Kuster N., Cumulative exposure of the human CNS in time and frequency domains. Abstracts of the NRP 57 Workshop: Non-Ionising Radiation - Health and Environment, 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), June 14, Davos, Switzerland, 2009.

Project 4057-113538: Live cell imaging during EMF exposure

Prof. Dr. Andreas Christ

Capstick M., Schär P., Ludin B., Romann A., and Kuster N., ELF exposure system for live cell imaging. Proceedings of the 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 14–18, 2010, Seoul, Korea, 2010.

Capstick M., Schär P., Ludin B., Romann A., Kuster N., ELF exposure system for live cell imaging. Abstracts of the NRP 57 Workshop: Non-Ionising Radiation - Health and Environment, 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), June 14, Davos, Switzerland, 2009.

Project 4057-11360: Effects of pulse-modulated radio frequency electromagnetic fields on the human brain: Critical field parameters, site of interaction and sensitivity in early adolescence

Prof. Dr. Peter Achermann

Crespo-Valero P., Christopoulou M., Zefferer M., Christ A., Achermann P., Nikita K. S., Kuster N., Novel methodology to characterize electromagnetic exposure of the brain. *Physics in Medicine and Biology*, 56, 2011, 383-396.

Schmid M.R., Loughran S.P., Regel S.J., Murbach M., Bratic Grunauer A., Rusterholz T., Bersagliere A., Kuster N., and Achermann P., Sleep EEG alterations: Effects of different pulse-modulated radio frequency electromagnetic fields. *J. Sleep Res.* 2011, in press

Regel S. J., Achermann P., Cognitive Performance Measures in Bioelectromagnetic Research - Critical Evaluation and Recommendations. *Environmental Health*, 10(10), 2011.



Loughran, S.P., Benz, D., Schmid, M., Murbach, M., Kuster, N., and Achermann, P., Effects of pulse-modulated RF-EMF on the human brain: Sensitivity in early adolescence, 33rd Annual Meeting of the Bioelectromagnetics Society (BEMS2011), June 12-17, Halifax, Canada, 2011.

Schmid, M.R., Loughran, S.P., Murbach, M., Lustenberger, C., Kuster, N., and Achermann, P., Effects of pulse-modulated RF-EMF versus pulsed magnetic fields on the human sleep EEG, 33rd Annual Meeting of the Bioelectromagnetics Society (BEMS2011), June 12-17, Halifax, Canada, 2011.

Loughran, S.P. and Achermann, P., RF EMF and brain physiology: Increasing evidence of effects on the waking and sleep EEG. Plenary topic in focus, 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 13-18, Seoul, South Korea, 2010.

Loughran, S.P., Schmid, M., Regel, S., Bratic, A., Maire, M., Bersagliere, A., Rusterholz, T., Dürr, R., Murbach, M., Kuster, N., and Achermann, P., Effects of pulse-modulated RF-EMF on the human brain: Site of interaction, 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 13-18, Seoul, South Korea, 2010.

Schmid, M., Bratic, A., Loughran, S.P., Regel, S., Murbach, M., Kuster, N., and Achermann, P., Effects of pulse-modulated radio frequency electromagnetic fields on the human brain: Critical field parameters, 32nd Annual Meeting of the Bioelectromagnetics Society (BEMS2010), June 13-18, Seoul, South Korea, 2010.

Loughran S., Schmid M., Regel S., Bratic A., Murbach M., Kuster N., Achermann P., Effects of pulse-modulated RF-EMF on the human brain: Critical field parameters, site of interaction and sensitivity in early adolescence. Abstracts of the NRP 57 Workshop: Non-Ionising Radiation - Health and Environment, 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), June 14, Davos, Switzerland, 2009.

Murbach M., Christopoulou M., Christ A., Crespo-Valero P., Zefferer M., Kuehn S., Achermann P., Kuster N., System to study CNS responses of ELF modulation and cortex versus subcortical RF exposures. Abstract Collection of BioEM 2009 Davos, the Joint Meeting of the Bioelectromagnetics Society and the European BioElectromagnetics Association, June 14-19, Davos, Switzerland, 2009.

Murbach M., Kuehn S., Christopoulou M., Christ A., Achermann P., Kuster N., Evaluation of artifacts by EEG electrodes during RF exposures. Abstract Collection of BioEM 2009 Davos, the Joint Meeting of the Bioelectromagnetics Society and the European BioElectromagnetics Association, June 14-19, Davos, Switzerland, 2009.

Project 4057-113595: Radio frequency electromagnetic field exposure and health related quality of life: Prospective cohort study

Prof. Dr. Martin Röösli

Frei P., Mohler E., Braun-Fahrländer C., Fröhlich J., Neubauer G., Röösli M. and the QUALIFEX-team Cohort study on the effects of radio frequency electromagnetic field exposure in everyday life on non-specific symptoms of ill health and tinnitus. *Environmental International* 38 (1), 2012, 29–36.

Mohler E., Frei P., Braun-Fahrländer C., Fröhlich J., Neubauer G., Röösli M. Does radiofrequency electromagnetic field exposure influence sleep behaviour? *10th International*



Congress of the European Bioelectromagnetics Association (EBEA), February 21-24, 2011, Rome, Italy.

Lauer O., Neubauer G., Rösli M., Frei P., Mohler E., Fröhlich J., Measurement Setup and Protocol for Characterizing and Testing of Personal Exposure Meters. *Bioelectromagnetics*, 2011, epub ahead of print: DOI 10.1002/bem.20687.

Lauer O., Benedickter H., Neubauer G., Rösli M., Fröhlich J. Calibration Measurement Setup for Band-Selective Personal Exposure Meters. 2010 Asia-Pacific Symposium on Electromagnetic Compatibility, 12-16 April 2010, Beijing, China Date. Asia-Pacific Symposium on Electromagnetic Compatibility (APEMC 2010), p. 381-384.

Mohler E. Effects of radiofrequency electromagnetic field exposure and sleep quality. PhD Thesis, University of Basel, Faculty of Science, 2011.

Bürgi A., Frei P., Theis G., Mohler E., Braun-Fahrländer C., Fröhlich J., Neubauer G., Egger M. and Rösli M., A model for radiofrequency electromagnetic field predictions at outdoor and indoor locations in the context of epidemiological research. *Bioelectromagnetics* 2010, 31: 226-236.

Frei P., Mohler E., Bürgi A., Neubauer G., Fröhlich J., Braun-Fahrländer C., Rösli M., Classification of personal exposure to radio frequency electromagnetic fields (RF-EMF) for epidemiological research: evaluation of different exposure assessment methods. *Environmental International* 36 (7), 2010, 714-720.

Frei, P., Mohler, E., Bürgi, A., Neubauer, G., Fröhlich, J., Egger, M., Braun - Fahrländer, C., Rösli, M. 2010. Cohort study on the effects of radio frequency electromagnetic field exposure in everyday life on non - specific symptoms of ill health. 32nd annual meeting of the Bioelectromagnetics Society, June 14 - 18, Seoul, Korea.

Frei, P., Personal exposure to radio frequency electromagnetic fields and implications for health. PhD Thesis, University of Basel, Faculty of Science, 2010. No. 9182. http://edoc.unibas.ch/diss/DissB_9182.

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Mohler E., Frei P., Braun-Fahrländer C., Fröhlich J., Neubauer G., Egger M., Rösli M., the Qualifex team, Effects of everyday radio frequency electromagnetic field exposure on sleep quality: a cross-sectional study. *Radiation Research*, 174(3), 2010, 347-356.

Mohler, E; Frei, P; Bürgi, A; Neubauer, G; Fröhlich, J; Egger, M; Braun-Fahrländer, C; Rösli, M. Effects of Radiofrequency Electromagnetic Field Exposure on Sleep Disturbances; Joint Conference of International Society of Exposure Science/International Society for Environmental Epidemiology, 2010 Seoul South Korea, *Epidemiology*, 22 (1S); p.248-249.

Mohler E., Frei P., Bürgi A., Neubauer G., Hettich A., Fröhlich J., Braun-Fahrländer C., Egger M., Rösli M. Effects of Radio Frequency Electromagnetic Field Exposure on Sleep Quality: A Cross-Sectional Study. 21st Annual Conference of the International-Society-for-Environmental-Epidemiology, AUG 25-29, 2009, Dublin, IRELAND. *Epidemiology* 20 (6), p. S52.



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Röösli M., Frei P., Mohler E., Hug K., Systematic review on the health effects of radiofrequency electromagnetic field exposure from mobile phone base stations. *Bulletin of the World Health Organization*, 88(12), 2010, 887-896.

Röösli M., Mohler E., Frei P., Sense and sensibility in the context of radiofrequency electromagnetic field exposure. *Comptes-Rendus Physique de l'Académie des Sciences*, 9-10, 2010, 576-584.

Frei P., Mohler E., Neubauer G., Theis G., Bürgi A., Fröhlich J., Braun-Fahrländer C., Bolte J., Egger M., Röösli M., Temporal and spatial variability of personal exposure to radio frequency electromagnetic fields. *Environ. Res.* 109(6), 2009, 779-785.

Frei P., Mohler E., Bürgi A., Fröhlich J., Neubauer G., Braun-Fahrländer C., Röösli M., A prediction model for personal radio frequency electromagnetic field exposure. *Sci. Total Environ.* 408(1), 2009, 102-108.

Mohler E., Frei P., Aydin D., Bürgi A., Röösli M., Persönliche Exposition durch hochfrequente elektromagnetische Felder in der Region Basel (Schweiz): Ein Überblick über die QUALIFEX-Studie, *Umweltmedizin in Forschung und Praxis*, 14(6), 2009, 329-338.

Frei P., Mohler E., Braun-Fahrländer C., Bürgi A., Egger M., Fröhlich J., Joos N., Neubauer G., Theis G., Röösli M. Personal Radio Frequency Electromagnetic Field Exposure in a Swiss Population Sample. 20th Annual Conference of the International-Society-for-Environmental-Epidemiology, OCT 12-16, 2008, Location: Pasadena, CA. *Epidemiology* 19 (6) p. S78.

Röösli M., Frei P., Mohler E., Braun-Fahrländer C., Bürgi A., Fröhlich J., Neubauer G., Theis G., Egger M., Statistical analysis of personal radiofrequency electromagnetic field measurements with nondetects. *Bioelectromagnetics*, 29(6), 2008, 471-478.

Project 4057-113370: Effects of UMTS radiation on cerebral blood circulation assessed by near infrared imaging

Prof. Dr. Martin Wolf

Lehmann H., Pollara L., Spichtig S., Kühn S., Wolf M., Head exposure system for a human provocation study to assess the possible influence of UMTS-like electromagnetic fields on cerebral blood circulation using near infrared imaging. *Bioelectromagnetics* 2011, epub ahead of print.

Spichtig S., Scholkmann F., Chin L., Lehmann H., Wolf M., Assessment of intermittent UMTS electromagnetic field effects on blood circulation in the human auditory region using a near-infrared imaging system. *Bioelectromagnetics* 2011, epub ahead of print .

Spichtig S., Scholkmann F., Chin L., Lehmann H., Wolf M., Assessment of Potential Short-Term Effects of Intermittent UMTS Electromagnetic Fields on Blood Circulation in an Exploratory Study, Using Near-Infrared Imaging. *Adv. Exp. Med. Biol.* 737, 2011 (in press).



Scholkmann F., Spichtig S., Muehleman T., Wolf M., How to detect and reduce movement artifacts in near-infrared imaging using moving standard deviation and spline interpolation. *Phys. Meas.* 31(5), 2010, 649-662.

Spichtig S., Multi-distance and multi-frequency frequency-domain near-infrared spectroscopy: characterization and application. PhD thesis, ETH No 19006, Zurich, Switzerland, 2010.

Project 4057-113281: Characterisation of effects of non-ionising radiation on the nematode *Caenorhabditis elegans* as a model organism

Prof. Dr. Pierre Goloubinoff

Pierre Haldimann, Maude Muriset, László Vigh, Pierre Goloubinoff, "The novel hydroxylamine derivative NG-094 suppresses polyglutamine protein toxicity in *Caenorhabditis elegans*. . *J Biol Chem.* in press (2011)

Haldimann P., Muriset, M., Zweiacker, P., Rachidi F., Goloubinoff P., Characterization of the effects of mobile phone radiations on transgenic *Caenorhabditis elegans* nematodes expressing polyglutamine aggregation proteins. Abstracts of the NRP57 Workshop "Non-ionizing Radiation – Health and Environment", 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), Davos Congress Centre, Davos, Switzerland, June 14, 2009.

Haldimann P., Muriset M., Zweiacker P., Rachidi F., Goloubinoff P., Characterization of effects of mobile radiations on the nematode *Caenorhabditis elegans* as a model organism. Abstracts of the European electromagnetics – EUROEM 2008 – Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, July 21-25, 2008.

Project 4057-113380: Effects of electromagnetic fields in vitro and in vivo: Identification and characterisation of stress-response pathways

Prof. Dr. Meike Mevissen

Alaeddine F., Guionaud C., Kuster N., Murbach M., Mevissen M., RF-EMF and stress response: Effect of RF-EMF on alternative splicing of acetylcholinesterase. Abstracts of the NRP 57 Workshop: Non-Ionising Radiation - Health and Environment, 31st Annual Meeting of the Bioelectromagnetics Society (BioEM 2009), June 14, Davos, Switzerland, 2009.

Murbach M., Mevissen M., Kuster N., Dosimetric assessment of *C. elegans* exposure in vivo to 900 MHz electromagnetic fields. Abstract Collection of BioEM 2009 Davos, the Joint Meeting of the Bioelectromagnetics Society and the European BioElectromagnetics Association, June 14–19, Davos, Switzerland, 2009.

Project 4057113597: Genotoxic effects of non-ionising radiation

Prof. Dr. Primo Schär

Focke F., Schuermann D., Kuster N., Schär P., DNA Fragmentation in Human Fibroblasts Under Extremely Low Frequency. *Electromagnetic Field Exposure. Mutat. Res.* 683, 2010, 74-83.



Project 4057-113411: Structure and effects of societal communication on non-ionising radiation

Prof. Dr. Peter J. Schulz

Schulz P.J., Hartung U., Diviani N., Keller S., Dangerous Towers, Harmless Phones? Swiss Newspaper Coverage of the Risk Associated with Non-Ionizing Radiation. *Atlantic Journal of Communication* (forthcoming), 2011.

Keller S., Schulz P., Diviani N., Risky Towers, Innocuous Phones: A Paradox in the Swiss Newspaper Coverage. Annual Conference of the International Association for Media and Communication Research (IAMCR). Mexico City, Mexico, 2009.

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Project 4057-113354: Affect and perception of non-ionising radiation: Implications for risk communication

Prof. Dr. Michael Siegrist

Cousin, M. E., Dohle, S. & Siegrist, M. (2011). The impact of specific information provision on base station siting preferences. *Journal of Risk Research*, 14(6), 703-715.

Dohle S., Keller C., Siegrist M., Conjoint Measurement of Base Station Siting Preferences. *Human and Ecological Risk Assessment*, 16(4), 2010, 825-836.

Dohle S., Keller C., Siegrist M., Examining the Relationship Between Affect and Implicit Associations: Implications for Risk Perception. *Risk Analysis*, 30(7), 2010, 1116-1128.

Dohle, S., Keller, C. & Siegrist, M. (in press). Mobile communication in the experts' and the public's mind: Insights from free associations to mobile phone base stations. *Human and Ecological Risk Assessment*.

Dohle, S., Keller, C. & Siegrist, M. (submitted). Fear and anger: An emotion-specific approach to risk judgments.