

BRAINTRAIN NEWSLETTER 5

BRAINTRAIN started in November 2013 and is coordinated by Cardiff University (Professor David Linden, Wales, UK). Our consortium brings together 13 complementary partners, including 10 academic research institutions, one small medium sized enterprise, a larger industrial partner and a technology transfer/management company.

To achieve our objectives, BRAINTRAIN program comprises 6 complementary workpackages. WP1: Coordination and management of the consortium, has strong links to all other WPs as its objective is to ensure good management and timely implementation of the BRAINTRAIN workprogramme, communication between the different WPs via regular meetings and reports. So far, we have met thrice: in Cardiff for the Kick-off meeting (2013) and in Maastricht (2014), Tel-Aviv (2015) and Coimbra (2016) for the annual meetings. In between, we have had regular ExCom meetings, where WP leaders meet and discuss the strategic points of the project. You can find in the BRAINTRAIN secure intranet the main information related the contractual aspects and the meetings.

Each team has now been working on its work packages for three years. The next pages provide an overview of what we have been doing so far and a focus on some important developments.

BRAINTRAIN will focus on 4 objectives

Objective 1

Develop new or optimize existing imaging technologies

Objective 2

Validate their application to mental disorders by integrating imaging data with complementary knowledge resulting from bioinformatics and clinical data.

Objective 3

Allow the diagnosis of mental disorders at the pre-symptomatic stage or early during development.

Objective 4

Better measure disease progression.

Scientific Coordinator

Professor David Linden

Cardiff University

Institute of Psychological Medicine and Clinical
Neurosciences

School of Medicine

Hadyn Ellis Bldg, Maindy Road
Cardiff CF24 4HQ United Kingdom

E-mail: LindenD@cardiff.ac.uk

Project managers

Delphine Smagghe – Caroline Schuster

Inserm Transfert

7 Rue Watt

75013 Paris FRANCE

E-mail: delphine.smagghe@inserm-transfert.fr
caroline.schuster@inserm-transfert.fr

BRAINTRAIN ANNUAL MEETING AND THE SYMPOSIUM MEDICAL DEVICES IN BRAIN RESEARCH: FROM DESIGN TO CLINICAL APPLICATIONS

The BRAINTRAIN partner University of Coimbra, led by Miguel Castelo-Branco, hosted the BRAINTRAIN annual meeting and the satellite symposium “Medical devices in brain research: from design to clinical applications”. The events took place from October 24th to October 26th, 2016.

The symposium, held at the premises of the Centro Hospitalar e Universitário de Coimbra, gathered dozens of national and international experts on a wide range of areas: from design and commercialization of medical devices to medical devices end-users (healthcare providers, clinicians, etc.). Daniela Pereira, David Linden, Rainer Goebel were among the speakers, that also featured representatives from Siemens and g.Tec.



Christoph Guger (g.tec, AT) talked on “Clinical applications of brain computer interfaces.”

The annual meeting took place at the Faculty of Medicine of the University of Coimbra. The meeting provided a space for dissemination and reflection on the work performed inside the consortium during the previous year.

The schedule of the meeting also considered brief periods of rest, where the consortium partners were able to visit some of the most important landmarks of Coimbra.



Daniela Pereira (University of Coimbra, PT), Rainer Goebel (BrainInnovation, NL) and David Linden (Cardiff University, UK) intervened on “Neurofeedback: from functional neuroimaging to clinical practice.”



Visit to the “Museu Nacional Machado de Castro”

More info on www.braintrainproject.eu/news



The BRAINTRAIN team members present at the annual meeting.

WORKSHOP ON REGULATIONS IN SOFTWARE AS MEDICAL DEVICES

Members of the consortium attended a training workshop in Maastricht on December 14th-15th. The workshop addressed 'Regulations in Software as Medical Devices', and was hosted by Brain Innovation.



Brain Innovation premises.

The speakers (Luva Salvatore and Sven Wittorf, <https://www.johner-institut.de/>) covered the basics in legal regulations, and gave guidelines on the directives, laws, harmonized standards and their relations. They also covered the software development and documentation process, as well as the importance of software testing and validation. The experience gained

from the clinical trials in the consortium informed interesting group discussions around risk management and clinical evaluation.

Luca and Sven also presented usability engineering considerations, and tools that can be used to practically document the requirements (<http://www.medsoto.de/>).



Luca Salvatore Sven Wittorf



TEL AVIV UNIVERSITY'S PARTICIPANT MONITORING SYSTEM

TAU team has developed an online system for participant monitoring during neurofeedback (NF) clinical trials.

The system holds a database of potential participants including demographic data and contact information. When a participant is screened (via a telephone interview) the content of the interview can be entered to the system and thus allows to monitor the participant's progress, e.g. if he/she was included or excluded (incl. the cause for exclusion) and general notes regarding the

participant. Each participant log also contains dates for clinical assessment, MRI and NF sessions. Emails and texts messages can be sent directly from the system to remind participants about upcoming appointments and to follow-up on their progress throughout the study. The system also has reminders for the staff when a certain participant should be contacted again (for follow-up time points). The system also allows to perform analysis on common exclusion causes, efficiency of staff members in recruiting, statistics of recruiting rates per month and more.

FIRST STUDY OF WP4 COMPLETES RECRUITMENT

The team at Oxford University and King's College London are pleased to report that the functional connectivity-NF study probing brain networks related to anxiety in girls has reached its recruitment target of 50 participants.

Further contact: Dr Kathrin Cohen Kadosh (kathrin.cohenkadosh@psy.ox.ac.uk) or Dr Jennifer Lau (jennifer.lau@kcl.ac.uk).

DISSEMINATION

The objective of WP6 is to insure an effective dissemination using different tools. A brochure was distributed to the partners, a logo for BRAINTRAIN was created and we have a public website which is updated regularly. In parallel, partners are very active presenting neurofeedback research at national and international conferences and invited seminar talks. We can list the following:

- ✚ On November 9th, 2016 Prof. Hendler spoke and acknowledged the BRAINTRAIN project at the Current Advances in Brain Stimulation and Neurofeedback conference at Tel Aviv University.
- ✚ BRAINTRAIN featured in a documentary on health effects of alcohol use produced for BBC Wales entitled 'Do I Drink Too Much?' The documentary was aired on December 15th, 2016 at 10:40 pm on BBC One Wales.
- ✚ In February 2017, Dr. Florian Krause and Michael Luehrs from Brain Innovation B.V./Maastricht University visited Cardiff University for several days. Hosted by Prof. Dr. David Linden, they gave an oral presentation on recent advances in Neurofeedback methodology, in which they

outlined the current state of Brain Innovation B.V. software products and showed first results of ongoing Neurofeedback research at Brain Innovation B.V. and the department of Cognitive Neuroscience at Maastricht University. In course of the European BRAINTRAIN project, they furthermore supported their colleagues in Cardiff optimising the real-time fMRI Neurofeedback setup at the recently opened research facilities in the new Cardiff University Brain Research Imaging Centre (CUBRIC). Both researchers greatly enjoyed their time in Cardiff and left being very impressed by the quality of the research and facilities at Cardiff University.

- ✚ On February 16th, 2017 David Mehler (Cardiff University/University of Münster) acknowledged BRAINTRAIN in an article on 'Neurofeedback Training: Where Imaging and Therapy Converge' posted on the Cognitive Neuroscience Society (CNS) blog (<http://www.cogneurosociety.org/neurofeedback-training-where-imaging-and-therapy-converge/>).
- ✚ David Linden (Cardiff University), coordinator of BRAINTRAIN, will present the project at the Workshop on Schizophrenia and other Mental Disorders 2017 (WSMD2017) hosted by the University of Pisa on June 15th-16th, 2017.

WSMD2017 will gather all FP7 projects funded under the call HEALTH.2013.2.2.1-2: Development of effective imaging tools for diagnosis, monitoring and management of mental disorders to share their results and discuss further common steps in their research.

This workshop is supported by EU DG for Research and Innovation (HEALTH) and by the Innovative Medicine Initiative (IMI). The coordinators of the IMI projects funded in the same field will also participate in the workshop.

Publications:

- Cox, W. M., Subramanian, L., Linden, D. E. J., Lührs, M., McNamara, R., Playle, R., Hood, K., Watson, G., Whittaker, J. R., Sakhuja, R. & Ihssen, N. (2016, December). **Study protocol for a randomized controlled trial of neurofeedback training for alcohol dependence using functional magnetic resonance imaging.** Poster presented at the 12th Annual Scientific Meeting of the UK Society for Behavioural Medicine (Cardiff, Wales, United Kingdom)
- Cohen, A., Keynan, J. N., Jackont, G., Green, N., Rashap, I., Shani, O., Charles, F., Cavazza, M., Hendler, T. & Raz, G. (2016). **Multi-modal Virtual scenario enhances neurofeedback learning.** *Frontiers in Robotics and AI*, 3, 52.
- R. Sitaram, T. Ros, L. Stoeckel, S. Haller, F. Scharnowski, J. Lewis-Peacock, N. Weiskopf, M.-L. Blefari, M. Rana, E. Oblak, N. Birbaumer & J. Sulzer. **Closed-loop brain training: the science of neurofeedback.** *Nature Reviews Neuroscience*, 18, 86–100 (2017)
- Chaudhary, U., Birbaumer, N., Ramos-Murguialday, A. (2016). **Brain-Computer interface for communication and rehabilitation.** *Nature Review Neurology*, 12, 9, 513-525.
- Spetter M. S., Malekshahia R., Birbaumer N., Lührs M., Van der Veer A. H., Scheffler K., Spuckti S., Preissl H., Veit R., Hallschmid M. **Volitional regulation of brain responses to food stimuli in overweight and obese subjects: a real-time fMRI feedback study.** *Appetite* (2017)
- Scharnowski, F., Veit, R., Zopf, R., Studer, P., Bock, S., Diedrichsen, J., Göbel, R., Mathiak, K., Birbaumer, N. Weiskopf, N. (2015). **Manipulating motor performance and memory through real-time fMRI neurofeedback.** *Biological Psychology*, 108, 85-97.
- Buyukturkoglu, K., Röttgers, H., Sommer, J., Rana, M., Dietzsch, L., Arikan, E.B., Veit, R., Malekshahi, R., Kircher, T., Birbaumer, N., Sitaram, R., Ruiz, S. (2015). **Self-regulation of anterior insula with real-time fMRI and its behavioral effects in obsessive-compulsive disorder: a feasibility study.** *PLOS ONE*, 10, 8: e0135872. Doi:10.1371.

- ✓ *The BRAINTRAIN website is available at the address:*
www.braintrainproject.eu
- ✓ *The extranet where you can find all the important documents regarding the agreement, the meetings and the dissemination is available at this address:*
<https://extranet-braintrain.atreal.fr/>
- ✓ *The Next Annual meeting will be held in Leipzig, Germany on October 16th-18th, 2017*