

NEWSLETTER 25

ERA-NET Neuron



Austria | Belgium | Canada | Finland | France | Germany | Israel |
Italy | Latvia | Netherlands | Norway | Poland | Portugal | Romania |
Slovakia | Spain | Turkey | UK

News From NEURON

During the first quarter of 2017, two research calls are expected to be published : JTC 2017 in January, and Joint Transnational ELSA Call 2017 (ethical, legal, and/or social aspects of Neuroscience)

The JTC 2014 Mid-term Symposium will be held in Madrid, September 2016, after NEURON's Network Steering Committee meeting

From the desk of the coordinator | September 2016



Marlies Dorlöchter

The recent meeting of the FENS Forum in Copenhagen had strong links with NEURON, and it was a great pleasure for me to see our ERA-Net in the context of this highly reputed and fascinating conference. Supporting young promising researchers is one of our main goals. We therefore organized in collaboration with FENS-CHET and the Human Mind Research Program of the Academy of Finland a networking event titled - **Next Generation Networks in Neuroscience from a career development.**

More than 300 students, postdocs and young PIs attended the event and discussed neuroscience and career opportunities in a relaxed atmosphere over food and drinks. Another highlight was the award ceremony of our 2015 "Excellent Paper in Neuroscience Award". The awardee, Dr. Julien Courtin (Basel, Switzerland), presented in a special lecture the results of his publication "Prefrontal parvalbumin interneurons shape neuronal activity to drive fear expression". And finally, NEURON sponsored the plenary lecture of a highly established and renowned researcher.



More information can be found on our website

<http://www.neuron-eranet.eu/index.php>



Produced by CSO-MOH, IL

ERA-NET NEURON | **SEPTEMBER 2016** | 1

Professor Dr. Hannah Monyer from the Department of Clinical Neurobiology at University Hospital Heidelberg talked about 'Inhibition in the brain: From individual cells to networks'. She focused on the functional analysis of different interneuron populations and the coordination of inhibition to synchronize the spiking activity in neuronal networks.



From left to right: Marlies Dörlöchter, Hannah Monyer, and J. Lerma Gómez

Neuroscientific research progresses our basic understanding of the structure and function of the human brain under healthy and pathological conditions. This knowledge is fundamental for the development of new diagnostics and treatments for patients suffering from neurological or psychiatric diseases. At the same time, the neurosciences have implications for the understanding, and thus potentially also the control, of human decision-making, behavior, emotions, and social interactions. Findings of the neurosciences can furthermore deeply affect human self-understanding and conscience as such. Therefore, it is of major importance to investigate the ethical, legal, and social aspects (ELSA) of the neurosciences and their recent advances. The high societal relevance of the neurosciences is underlined by continuously high public interest and ongoing public discourse on this topic. Therefore, NEURON explored recent ideas and developments in the field of neuroethics by organizing a symposium in Milan, Italy, in May 2016.



The speakers at the workshop, together with NEURON coordinator and the local host. From left to right: António Jácomo, Manuel Curado, Marlies Dörlöchter, Hannah Maslen, Carlos Pereira, and Fabrizio Tagliavini.

Leading European philosophers, psychiatrists and neuroscientists discussed important research and emerging social questions (<http://neuron-eranet.eu/en/691.php>). The workshop was the second of a series of focused activities (<http://neuron-eranet.eu/en/674.php>) embedded in NEURON's agenda addressing the 'Interaction with the general public and stakeholders'.

This newsletter is dedicated to the symposium and summarizes the main ideas presented by the speakers.

Marlies Dorlöchter.



Attending the workshop

NEUROETHICS WORKSHOP

On May 9, 2016 NEURON members from all over Europe gathered at the FONDAZIONE IRCCS, Carlo Besta Neurological Institute in Milan, Italy for a thorough and very unique workshop on Neuroethics, organized by Carlos Pereira from FCT, Portugal.

Neuroethics is a relatively new interdisciplinary field. It focuses on ethical issues emerging from the newest and evolving technologies in brain research. Thus, mandating a new examination of the ethical, social, economic and legal implications of these technologies, and the concomitant implications for social policy.

The workshop brought together 40 participants representing 18 countries and 25 national research funding organizations participating in NEURON.

The speakers presented a general introduction to a number of topics that are important in the field of brain research and may require specific attention in the NEURON-funded projects or be subject to the next call on Ethical, Legal, and Social Aspects (ELSA) of Neuroscience.

The workshop ended in a fascinating discussion on the emerging ethical concerns in neuroscience today, including cognitive enhancement, drugs and interventions that affect a person's identity, brain privacy, and more.

The abstracts of the workshop lectures are presented below.





António Jácomo

**FROM THE ETHICS OF THE BRAIN, TO THE BRAIN OF THE ETHICS****António Jácomo**

Bioethics Institute of the Catholic University of Portugal

Recent advances in neurosciences promote a neuroethical debate, often shrouded in skepticism and lack of concern. The nature of the brain has attracted philosophers and scientists for thousands of years.

But can modern neuroscience ever hope to crack this mysterious phenomenon?

The purpose of this reflection is to reveal how neuroscience advances could improve the ethical reflection. The link that we attempt is to make a synthesis of the "brain of the ethics" and the "ethics of the brain".

Inspired by Block (2009), we propose a vision and a summary of four theoretical perspectives: Neuroreductionist; Neurofunctional; Neurodualistic; Neurophenomenological.

Faced with the brain complexity, neuroscience leads us to a kind of humility. The real triumph of neuroscience would be to make us aware of "how" we can discover: using correct methods, and relying on the structure of science as a basis of knowledge, we can understand not only the world but also the experience of ourselves. This is the framework within which we could fit Neuroethics; which is not knowledge, but gives "meaning to learn" through a set of proposals for the integration of scientific advances in the context of a genuine humanity.

What accounts for this change? Part of the shift reflects the deepening neuroscience expertise of many neuroethicists and the migration of neuroscientists to the field of neuroethics.



BRAIN IMAGING AND BRAIN INTERVENTIONS

Andrea Lavazza

Research Fellow, Centro universitario internazionale, Arezzo,
Italy Secretary of the Italian Society for Neuroethics

Andrea Lavazza



Brain imaging techniques are clinical and scientific tools that have allowed a giant leap in recent decades. But there are many ethical issues related to them:

- (1) Brain imaging might heavily interfere with brain privacy, when a person is requested to undergo a brain scan for whatever reason.
- (2) Incidental findings, undiagnosed medical or psychiatric conditions that are discovered unintentionally, need to be carefully considered and sometimes can create moral dilemmas.
- (3) Brain Evidence vs. Brain Functioning: what we see in the brain is not always what the brain can and cannot do. So there are risks of hyper-valuing brain imaging as a direct access to mind/brain, which is not true.
- (4) Predictive Neuroimaging: for example, psychotic disorders, such as schizophrenia, are associated with neuroanatomical abnormalities. Some of the grey-matter abnormalities associated with psychotic disorders predate the onset of overt symptoms: when and what should the patient be told?
- (5) Non-Clinical Uses: Assessing Offenders and Skills Evaluation. Specific profiles of activation of specific brain areas as well as specific architecture and connectivity can be good predictors of impulsive and/or aggressive behaviour. Markers similar to those used in criminal contexts can be good predictors of a person's specific skills. And brain scans could take the place of job interviews. All of that raises relevant political and social issues.

Regarding brain interventions, there are many ethical issues related to:

Psychopharmacology (therapeutic and novel treatments); Neurosurgery; Psychosurgery; Neurostimulation; Cognitive and affective enhancement; Brain-machine interfaces; Gene-editing.

For example, regarding, psychopharmacology, beyond safety and effectiveness, a strong social pressure to adapt and be productive exists. As a consequence, patients undergoing pharmacological treatment adapt themselves to situations which they might otherwise try to change. Pills can discourage people from seeking political solutions to social problems, which turn into medical problems treated individually.



DEEP BRAIN STIMULATION FOR THE TREATMENT OF ANOREXIA NERVOSA AND CHRONIC PAIN

Hannah Maslen

Research Fellow in Ethics, The Oxford Uehiro Centre for Practical Ethics, University of Oxford

Hannah Maslen



Deep Brain Stimulation (DBS) involves surgically implanting a battery-operated neurostimulator to deliver electrical stimulation to targeted areas in the brain via electrodes implanted in the brain.

To date, DBS has most routinely been used to treat the debilitating motor symptoms associated with Parkinson's disease. However, DBS is now being trialled as a treatment for a range of other disorders. Treatments are still in early, investigational stages and raise a number of ethical issues. Two potential indications for DBS include the psychiatric disorder, anorexia nervosa (AN), and medically refractory chronic pain. Here we will examine the ethical issues associated with using DBS to treat these very different conditions.

Anorexia nervosa - In relation to AN, I distinguish three potential mechanisms alluded to in the neuroscientific literature, relating to desire, control, and emotion, respectively. I explain why the precise nature of the mechanism has important implications for the patient's autonomy and personal identity. I then consider practical dimensions of offering DBS to patients with AN, identifying some limited circumstances where the mere offering of the intervention might be perceived as exerting a degree of coercive pressure that could serve to undermine the validity of the patient's consent.

Chronic pain - In relation to chronic pain, I discuss the significant ethical issues raised by the high risk of recurrent seizure and even the development of de novo epilepsy. Some patients expressed a preference to continue with stimulation despite the experience of seizures. This raises questions about whether patients should be allowed to choose to undergo such a risky intervention given that it is not indisputably in their best interests.

Understanding how the patient's autonomy can be promoted in these cases will be essential. Further ethical challenges are raised by the apparent side effect of increased apathy. Close attention must be paid to any implications of DBS-induced apathy for the patient's treatment-related decision-making and, indeed, her broader wellbeing.



Manuel Curado

**NEUROLOGICAL CORRELATES OF ETHICITY: THE COGNITIVE BIASES OF MORAL THINKING AND MORAL BEHAVIOR**

Manuel Curado

University of Minho, Institute of Arts and Human Sciences
Campus of Gualtar, Portugal

Ethics is the systematic investigation of voluntary human behavior that aims at the pursuit of happiness. There are many constraints that greatly limit the scope of human action. The ethics is the systematic exploration of those constraints. Aristotle is perhaps the philosopher who presented in a more comprehensive way the field of ethical reflection, and Hegel the philosopher who launched the novel field of ethiccity. This communication seeks to show that contemporary neuroscientific research is changing radically what was known about the way ethiccity influences ethics. Moral categories such as poor decision, reward, influence of beliefs in action, behavior motivated by fear, suicidal ideation, painful memories, honesty, responsibility, addictions and dependencies, and many others, are being significantly altered.

Although these investigations are very important for ethics, this communication argues the case that the assessment of this importance depends on a deliberate conceptual limitation of the most difficult theoretical problems linked to the relationship between the brain and the human mind. We are far from understanding the whole connection between mental states and behavior and, above all, what determines a particular behavior. Saying this another way: the real impact of neuroscience has been rhetorically inflated. The public perception of neuroscientific results was oversimplified by a theoretical model that considers mental life a byproduct of brain activity. There is still room for doubt.

In any case, the theoretical debate about ethics and ethiccity does not diminish the importance neuroscience has for health. This communication proposes that should be sought a balance between excessive enthusiasm for the promises of neuroscience and a fair assessment of its actual results in the context of intellectual debate. Ethical monitoring of neuroscientific research should be constant.