

## Reflections on the Need for More Training in Neuroethics for Future Physicians: An Interdisciplinary Approach

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### To the Editor,

Recent breakthroughs in brain research suggest that Neuroscience is set to become one of the fastest growing fields in Biomedicine. This is borne out by the technological development of neuroimaging techniques, the rising number of associations, and the growth in funding, research projects and publications. These advances have also given rise to a range of ethical, moral, anthropological and even theological concerns and controversies that the scientific community needs to address. Some of this issues raised are the origin of consciousness and learning processes, the existence of free will, the wisdom of enhancing the human species through artificial implants, and of healing mental illness through changes to the brain structure.

In addition, some areas of neuroscientific research and certain brain imaging techniques have been taken beyond the mere healing function and are now being applied in the public and private sectors, where they collaborate in marketing, politics, law—both to provide evidence in trials and to design tailor-made social reintegration programs—and even in personnel selection.<sup>1</sup>

In 2002, 150 experts gathered at a meeting in San Francisco (California) to debate the ethical and social concerns resulting from the broadening of neuroscientific applications. It was at this event, organized by the Stanford University and the University of California, San Francisco, and underwritten by the Dana Foundation, that Neuroethics was officially established as: “the examination of what is right and wrong, good and bad, about the treatment of, perfection of, or unwelcome invasion of, and worrisome manipulation of the human brain” (Available from: [http://dana.org/Cerebrum/2002/Neuroethics\\_Maping\\_the\\_Field](http://dana.org/Cerebrum/2002/Neuroethics_Maping_the_Field), updated 2002 Jul 1; cited 2016 May 13).

The interaction between biology, behavioral science, and philosophy regarding human brain phenomena makes Neuroethics a natural interdisciplinary science. Moreover, the science has direct implications in social, legal, and political dimensions (Available from: <http://www.philosophica.info/voces/neuroetica/Neuroetica.html>, updated 2009; cited 2016 May 13).<sup>2</sup> Illes and Bird indicate that the cross-disciplinary field of Neuroethics should be driven by education and communication, in accordance with the fourth objective outlined at the San Francisco meeting.<sup>3</sup>

We believe that the cross-disciplinary approach of Phenomenology offers a way to promote a dialogue between sciences and to train future physicians. This school of thought, which applies theoretical and practical principles to Medicine, was created by Edmund Husserl. According to Phenomenology, if philosophers and physicians agree that the body comprises two interlinked dimensions, the biological and the existential,<sup>4</sup> it would follow that disease is not just an organic dysfunction; it affects all aspects of the patient’s life, drastically altering the body as well as social interaction, perception of time and, ultimately, identity. Thus, to fully overcome a disease, the biological function of the patient’s organism needs to be re-established and

their existential situation restored.<sup>5</sup>

The study of the physical and human dimensions of disease is beneficial to the training of future physicians. Such research also facilitates a healing process centered on the patient, whose experience of illness is highly personal. Thus, advances in medical diagnosis and treatments are enhanced by a humanistic focus that helps patients deal with the toughest moments of their lives: their pain, their suffering and, in the last instance, their death. Ethics and science converge to transform medicine into a more humane science in a world threatened by an excess of technological progress.

As an example of cross-disciplinary training for medical students, a conference on drug addiction, held last April in Barcelona,<sup>6,7</sup> analyzed both the physical-chemical aspects of drug addiction and the human side inherent to this problem. In this regard, a debate took place on how neuronal plasticity modifies the synapses, inhibits the neurotransmitters and neuroreceptors, and modifies the basal levels. Addiction was also discussed from an anthropological point of view, based on the Aristotelian conception of will, according to which the need for reward and free will is essential to human behavior. The interdisciplinary approach of the conference allowed attendees to explore both the physical and personal aspects of drug dependency, and discuss to apply the conclusions to the comprehensive treatment and care of patients.

Neuroscientific research provides quantifiable data on human behavior and draws on psychological, social and intellectual contributions, opening up new horizons for science. Faced with the many challenges in today’s world, the discipline of Neuroethics dynamically links science and ethics, bridging the divide between the empirical, social and human sciences. In this way, Neuroscience becomes a science of humans for humans.

Thus, we launch this reflection in order to seek educational strategies to strengthen the reciprocal dynamics between scientific explanation and ethic-reflexive analysis, which with a view to tackling the challenges posed by Neuroscience.

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