

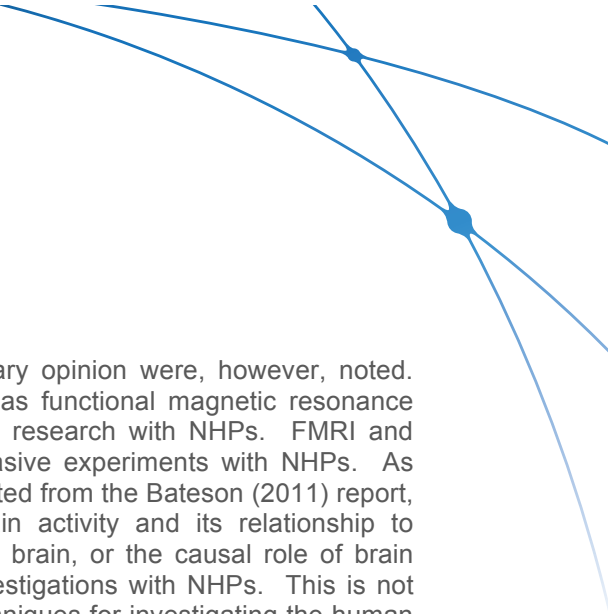
23/02/17

**Preliminary Opinion on The need for non-human primates in biomedical research, production and testing of products and devices (update 2017)**

Dear Members of SCHEER and external advisors,

The Federation of European Neurosciences Societies (FENS) welcomes the preliminary SCHEER opinion on the need for non-human primates (NHPs) in biomedical research, production, and testing of products and devices (update 2017). FENS is an organization representing 24,000 scientists in 33 European countries. FENS strongly advocates the responsible use of animals in biomedical research. Animal research, including research with NHPs, continues to be the basis for medical advances that have extended our life expectancy and has already raised our chances of overcoming or ameliorating life-threatening and debilitating diseases.

Research with NHPs, because of their physiological similarity to humans, has been a cornerstone of basic neuroscience research. It has made, and continues to make, contributions to fundamental knowledge about brain structure and function (neuroanatomy and cognitive neuroscience) in relation to learning, perception, decision making, working memory, attention, and motor control as well as many other areas. It is this bedrock of fundamental knowledge that guides current research into the human brain. In addition it has led to advances in the treatment of neurological diseases. For example, the prestigious 2014 Lasker Prize for Clinical Research was awarded to Drs Mahlon R. DeLong and Alim Louis Benabid who made critical contributions to the development of the deep-brain stimulation technique used in the treatment Parkinson's disease. This medical breakthrough has helped over two hundred thousand Parkinson's patients and would not have been developed had it not been for research on the physiology of a brain structure called the basal ganglia in NHPs. Further examples include the contribution of non-human primate neuroscience to the understanding and treatment of stroke and spinal injury where the similarity in the organization of the neural pathways controlling movement in human and NHPs has been critical. Similarly non-human primate studies have been essential for understanding the visual system and control of eye movements, where the organization of the retinal photoreceptors, the binocular structure of the visual pathways and cortex, and the neuronal circuitry supporting the variety of eye movements are not found in full form in other animal models. Research on the dopaminergic "reward" system in NHPs has had a huge impact on the way that scientists now attempt to understand a variety of pathological conditions and psychological illnesses. Non-human primate research has also been critical in many other fields beyond neuroscience. While only a small proportion of animal research in Europe involves NHPs we were pleased that its importance was recognized in the SCHEER opinion.



Three points of concern relating to the SCHEER preliminary opinion were, however, noted. First, non-invasive human neuroimaging techniques, such as functional magnetic resonance imaging (fMRI), were proposed as potential alternatives to research with NHPs. fMRI and related approaches do not offer simple alternatives to invasive experiments with NHPs. As noted on page 49 of the SCHEER opinion, in an excerpt quoted from the Bateson (2011) report, these techniques cannot tell us about the nature of brain activity and its relationship to behaviour, the nature of anatomical connections within the brain, or the causal role of brain regions in behaviour with anything like the precision of investigations with NHPs. This is not simply due to a lack of scientific interest in non-invasive techniques for investigating the human brain; these approaches have been some of the most popular in neuroscience over the last two decades. Considerable effort in laboratories in many European countries and beyond has been devoted to advancing their spatial and temporal resolution. Research funders in many European countries have invested heavily in their development and expansion. Rather the limitations of the techniques appear intrinsic to the techniques themselves. For this reason neuroscientists do not regard such techniques as simple alternatives to non-human primate models but rather as complementary. Animal models reveal fundamental features of neurons and neural circuits and non-invasive approaches with human subjects tell us how such knowledge can be extrapolated and exploited in understanding the human brain. Both sets of approaches are powerful but in different ways. It is through their combination that neuroscience has advanced. That many researchers use both approaches is a testament to their complementary strengths.

Second, the report includes some errors regarding the severity of neuroscientific procedures. For example on page 46 of the SCHEER opinion the Pickard (2013) Report is cited, but the conclusions of that Report are not given. It considered 10 years of research with 149 macaques and 82 marmosets conducted in the UK. A major conclusion of the report was that there was little or no evidence of a high welfare impact or of cumulative suffering (section 1.2.4 on p 7 of Pickard, 2013). Confirming this, since 2013, retrospective reports (as opposed to prospective assessments) of the actual impact of scientific procedures have been compiled in the UK (as requested by Directive 2010/63/EU). These data show that over 90% of NHP basic research studies have been assessed at the Moderate level or lower, rather than Severe. In accordance with such experience in the UK we note that in many European countries the severity classification of NHP neuroscience procedures is Moderate. Rather than just focus on the UK situation, the report should reflect the fact that other EU countries have decided upon a Moderate assessment for NHP neuroscience studies.

The final point that we wanted to emphasize in relation to the report concerns the importance of fundamental and basic research in neuroscience. There is a risk of artificially separating fundamental research from research with direct and immediate clinical translation. It is, however, essential to remember that clinically oriented research with immediate and short term impact on patients is guided by the knowledge derived from basic research.

Yours sincerely,

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