Agenda

Expert Consultation: "Neurotechnology and Society"

14-15 September 2017

National Academy of Sciences

2101 Constitution Ave NW

Washington D.C.

United States

Introduction and aims

This 1.5-day Expert Consultation will bring together leaders from across sectors to assess ethical, legal, societal, regulatory, and economic aspects of innovation in neurotechnology. The meeting is part of a larger OECD project to produce points to consider and best practices in the field, and to explore possible recommendations for the open and responsible development of neurotechnology. This Expert Consultation will serve as an important starting point for a larger Workshop in spring 2018. The meeting should culminate in a short report that outlines points to consider, best practices, and/ or approaches for stakeholder consideration, and discusses possible next steps in this larger international initiative.

Rationale and scope

Addressing the increase in diseases associated with an aging population and mental illness remains a top priority for many countries and is reflected at the highest levels of international dialogue, e.g. the 2016 G7 in Japan and the 2017 G7 in Italy. Neurotechnology can be defined as devices and procedures that are used to access, monitor, investigate, assess, manipulate, and emulate the structure and function of the central nervous system. Advances in neuroscience and neurotechnology present major opportunities for health innovation and societal benefit, but also raise difficult questions at the intersection of science, society and economy (Table 1).

The OECD Working Party on Biotechnology, Nanotechnology, and Converging Technologies (BNCT) has helped produce a series of meetings and reports addressing Alzheimer's and other neurological disorders (OECD, 2015; OECD, 2016). A recent BNCT workshop, "Neurotechnology and Society: Strengthening Responsible Innovation in Brain Science" (15-16 September 2016 Washington D.C., United States), fostered international dialogue and cooperation across national initiatives on issues of open and responsible innovation in the arena of the brain. The meeting also identified key challenges and barriers to integrating ethical, legal and social concerns upstream in technological development and within neuroscience research. A key message was that more might be done to share good practices and develop common understandings across national research initiatives and jurisdictions.

Table 1. Examples of stakeholder groups, normative frameworks, issues (opportunities and concerns), and categories and potential uses of neurotechnology.

Stakeholder groups	Issues	Normative frameworks
• researchers and research institutions • health care professionals • business/ manufacturers • policy makers • patients/ consumers • regulators • civil society and publics • funders • payers	• enhancement versus therapy • consciousness • cognitive liberty, autonomy • privacy • human identity • dual-use • hype and false claims • education • distributive justice and access • democratic governance	• anticipatory governance • RRI (responsible research and innovation) • ELSI (ethical, legal, social issues) • open science/ open innovation • innovation foresight • neuroethics/neurolaw • human rights

Categories of neurotechnologies	Potential uses of neurotechnologies
• invasive and non-invasive modulation • monitoring/ imaging devices • neuroprosthetics • nerve- and brain-machine interfaces • artificial neural networks • brain modelling and mapping • artificial intelligence technologies	• diagnosis • therapy • enhancement • recreation • research and learning • governance • law enforcement/ control

Note: the examples listed in this table are not exhaustive and apply to the OECD project "Open and Responsible Innovation in Neurotechnology".

08.30-09.00 ► **Registration & breakfast**

09.00-09.15 ► **Welcome messages**

09.15-12.30 ► **Session 1: Mapping the new frontiers in neurotechnology and society**

Moderator: Prof. Dr. James Giordano; Chief, Neuroethics Studies Program- Pellegrino Center for Clinical Bioethics, and Professor, Departments of Neurology and Biochemistry, Georgetown University Medical Center, Washington, D.C., USA

Identify and classify cutting-edge neurotechnologies (e.g. neuroprosthetics, cell implants in the brain, brain-computer interfaces, artificial intelligence technologies) and the ethical, legal and social issues that arise with them. This will include discussion of both the technological present and future.

Key questions to be discussed:

- How is novel neurotechnology currently transforming research, health, and society?
- What are key trends and what does the future look like for different neurotechnologies?
- What key human values and interests are most at stake?

12.30-14.00 ► **Lunch**

14.00-15.30 ► **Session 2: Responsible innovation, stakeholders, and publics**

Moderator: Dr. Debra J.H. Mathews (Assistant Director for Science Programs, Johns Hopkins Berman Institute of Bioethics; Associate Professor, Department of Pediatrics, Johns Hopkins University School of Medicine, Baltimore, MD, USA)

Identify key frameworks and best practices in the responsible development of neurotechnology, i.e. practices that align the emergence of technology with the values, needs, and concerns of stakeholders and publics. Discuss the question of which actors must be involved and when, in any responsible development of neurotechnology. Discuss goals and mechanisms for stakeholder involvement, and identify new forms of collaborative innovation.

Key questions to be discussed:

- What actions are stakeholders taking to consider ELSI? In what fora are they meeting?
- Who are relevant stakeholders/ publics in the development of neurotechnology and how -- and at what stage -- should they be included in the innovation process?
- Are there practices in other fields that have proven effective at aligning innovation with public values, interests, and goals?
- What norms and frameworks around collaborative innovation (e.g., open science, open innovation, responsible research and innovation) have emerged or are emerging to aid the responsible development of neurotechnology?
- Who does/ will support and evaluate efforts at inclusive engagement in responsible development of neurotechnology?

15.30-16.00 ► **Coffee break**

16.00-18.00 ► **Session 3: Defining the components of possible recommendations**

Moderator: Prof. Dr. Gary E. Marchant (Prof. Gary Marchant, Faculty Director and Regents Professor, Center for Law Science & Innovation, Arizona State University, USA)

Neurotechnology raises a plethora of ethical, social, policy and legal issues. In this session, we want to identify and prioritize those applications and issues that meet both of the following two criteria: 1) they are issues of substantial societal importance that are likely to be feasible and have some potentially problematic implications (even if also some beneficial implications

and applications) over the next decade or so; and 2) they are issues that lend themselves to cross-national coordination because for example they may create transboundary issues, may result in the creation of "risk havens" or medical tourism, may violate fundamental norms of human rights, or some other reason that warrants international coordination. Building on the previous sections, and considering the existing landscape of governance instruments, this session identifies major areas that might compose a set of recommendations coming from the OECD member states.

Key questions to be discussed:

- Do existing sources of governance at the local, national, and international level adequately address the goals of open and responsible development of neurotechnology?
- What is taxonomy of issues of greatest importance that should be included in (international) guidance?

18.00-19.30 ► **Reception**

08.30-09.00 ► **Breakfast**

09.00-12.00 ► **Session 4: Distilling advice on best practices for possible recommendations**

Group work towards possible recommendations on "Open and Responsible Innovation in Neurotechnology". Presentation of key leanrings from Day 1. What expert advice might inform a possible effort to develop recommendations? Discuss key governance issues and possible scope of 2018 meeting.

12.00-12.30 ► **Meeting summary**

12.30 ► **End of meeting**