Highlights from the NAS Transgenic and Chimeric Neuroscience Research Workshop

10/23/2018

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Transgenic and Chimeric Neuroscience Research:

Exploring the Scientific Opportunities Afforded by New Nonhuman Primate Models

A Workshop | Washington, DC
October 4, 2018
#NeuroForum

The National Academies of SCIENCES ENGINEERING MEDICINE

Workshop Planning Committee

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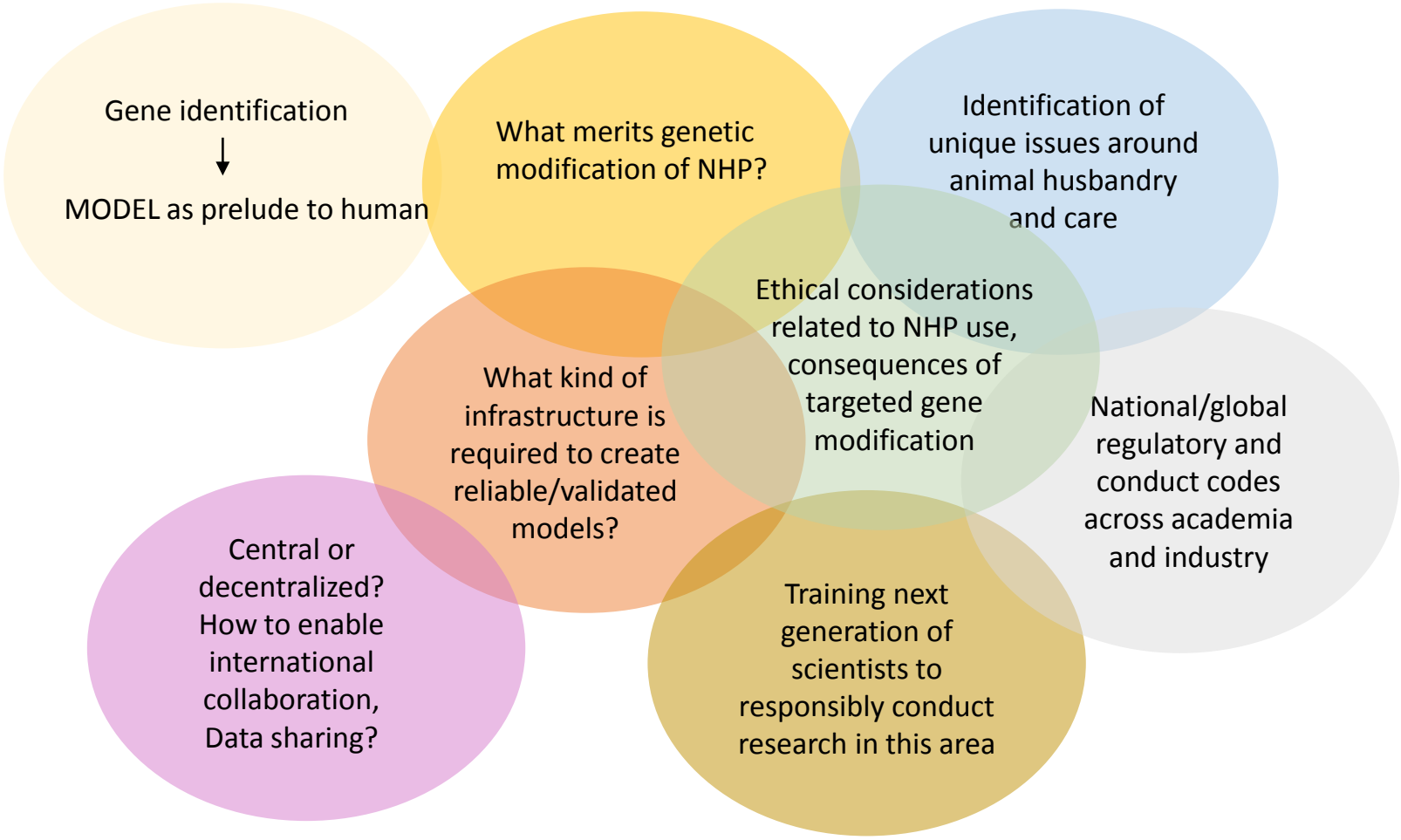
Karen Parker, Stanford University
Michael Steinmetz, National Eye Institute
Andrew Welchman, Wellcome Trust
Stevin Zorn, MindImmune Therapeutics, Inc.

Workshop Objectives

To bring together experts and key stakeholders from academia, government, industry, and non-profit organizations to examine the scientific opportunities and challenges, as well as bioethical considerations, of genetically engineered nonhuman primate models for neuroscience research.


Gene identification
↓
MODEL as prelude to human
What merits genetic modification of NHP?
Identification of unique issues around animal husbandry and care
Ethical considerations related to NHP use, consequences of targeted gene modification
What kind of infrastructure is required to create reliable/validated models?
National/global regulatory and conduct codes across academia and industry
Central or decentralized? How to enable international collaboration, Data sharing?
Training next generation of scientists to responsibly conduct research in this area

Agenda Overview

- **Session I**: Emerging Transgenic and Chimeric Nonhuman Primate Models for Neuroscience Research and Therapeutic Development for Nervous System Disorders
- **Session II**: Technology, Research Methodology, and Assessment Tools For Transgenic and Chimeric Nonhuman Primate Models
- **Session III**: Bioethical Considerations for Transgenic and Chimeric Nonhuman Primate Models in Neuroscience Research
- **Session IV**: Moving Forward: Policy and Infrastructure Needs to Advance Research

Compared to “traditional” NHP neuroscience research…

...does animal use and care need to be different for “transgenic & chimeric” NHP research?

…does the scientific justification need to be different?

These questions emerge from a genuine concern of Investigators for the animals they work with.

- There is a body of knowledge on how to take care of animals with induced and spontaneous disorders
- There is a system already in place for vetting ideas. RFAs, grant peer review and IACUC (between others) put to the test the validity and relevance of the scientific question, the approach and animal care

Paraphrasing Dr. Hyman…

1) Why are we doing NHP research?

- Rodents vs NHPs: modestly social vs. social; olfactory vs. visual; nocturnal vs diurnal
- NHP models are complimentary to mice models. Translational models introduce scientific constraints. Match model to question.
- Re-education of scientists to avoid limiting model choice by availability

2) Infrastructure and scientific needs:

- We need to learn more about NHP brains
- Building toolkits
- If CRE expression is toxic, what else?
- Specialized nature of facilities, cost, space, requirements generation will benefit from a coordinated but not "soviet state"
- Ensure genetic diversity

3) Ethical issues:

- Beyond benefit/harm issues, NHP justification
- Making sure science is solid
- System should self-regulate
- Need to communicate: human and animal care teams, scientists with public