Review Form

***NIMH DIR Review of New* Animal Study Proposals for Research Using Nonhuman Primates (NHPs)**

(Must be completed prior to ACUC Review)

Title of Animal Study Proposal (ASP):

Neurobehavioral Development in the Common Marmoset

Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Members of Nonhuman Primate Research Review Committee (NHPRRC):

Name (Chair *) Affiliation

Redacted by agreement

Animal Study Proposal Review:

Yes	No	
(x)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(x)	( )	The proposed experiments are well designed to address the research questions.
(x)	( )	Alternatives to animals could not be used.
(x)	( )	The rationale for the use of NHPs is substantiated.

Discussion Supporting the Committee's Decisions

See attached

Decision of NIMH Scientific Director

Based upon the review provided by the NHPRRC, I (x)-Endorse ( )-Do not Endorse this ASP for submission to the NIMH ACUC.

Redacted by agreement

Scientific Director, NIMH

1-24-17

Date

Approved April 29, 2016

Obtained by Rise for Animals.
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Review Form

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Name (Chair *) Affiliation

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(X)	( )	The proposed experiments are well designed to address the research questions.
(X)	( )	Alternatives to animals could not be used.
(X)	( )	The rationale for the use of NHPs is substantiated.

Discussion Supporting the Committee's Decisions

This ASP aims to investigate in the organization of the frontotemporal circuitry of newborn and adult common marmosets as a way to understand the cognitive and social impairments that exist in human patients with excisions or damage to portions of the frontal and temporal lobe, or those with abnormal development of their frontal and temporal lobes.

The ASP calls for using 72 marmosets per year for 3 years. The study has 3 basic classes of experiments. In anatomical experiments large-scale multi-synaptic circuits will be traced to define collateralized axonal projections and determine specific populations of neurons within a circuit. These experiments will involve high resolution anatomical MRI of the brain, and unilateral injections of viruses targeting specific prefrontal areas, retrosplenial cortex, regions of the temporal lobe and discrete thalamic nuclei. In behavioral experiments, targeted manipulations of specific brain regions or circuits will be performed with or without cannulae or optic fiber implants. And the neurodevelopment experiments will establish the role of normal development of frontotemporal circuits in

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early life on long-term behavioral and emotional impairments. The number of animals requested is well justified and it is the minimal number of animals required to answer the questions posed by the investigators.

The use of animals is justified due to the need to make direct measurements of the intact brain to gain knowledge about its function. The use of marmosets as a species is justified because they are nonhuman primates with an anatomical and functional organization of the brain that largely parallels those of the human brain. In particular, nonhuman primates have a well-developed frontal cortex, which is essential to allow the investigation proposed in the current proposal. Furthermore, marmosets have a number of practical advantages that make them highly suitable for anatomical, behavioral and developmental studies, including small size, ease to handle, and a flat, smooth cortex that allow easy localization of functional brain regions and facilitate investigation with imaging, intracranial injections and electrophysiology. Marmosets are particularly suited for developmental studies due to their high reproductive rate and fast maturation when compared to other nonhuman primate species. And marmosets have a similar social structure to that of humans, living in close-knit families, with a high degree of cooperative care, and learning through social and vocal interactions. Thus, this small primate can model important changes in disorders of human affective and cognitive state.

Based on all the information provided in the ASP, it is the opinion of this reviewer that the study is scientifically sound and well justified, the use of nonhuman primates is well substantiated and this study should be allowed to be carried out.

Redacted by agreement

01/23/2017

Date

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Review Form

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Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Members of Nonhuman Primate Research Review Committee (NHPRRC):

Name (Chair *) Affiliation

Redacted by agreement

Animal Study Proposal Review:

Yes	No	
(X)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(X)	( )	The proposed experiments are well designed to address the research questions.
(X)	( )	Alternatives to animals could not be used.
(X)	( )	The rationale for the use of NHPs is substantiated.

Discussion Supporting the Committee's Decisions

The proposal represents a comprehensive study designed to elucidate neural mechanisms underlying complex behaviors in a marmoset model. The proposed techniques and behavioral tests represent state-of-the-art methodologies that by combining viral anatomical techniques and various methods to manipulate brain circuitry will likely result in novel important findings. Developmental component of the proposal also represents a unique approach. Overall, it is a very important study that has a high relevance to human cognitive and affective disorders.

Redacted by agreement

Redacted by agreement **Date:** January 24, 2017

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Review Form

***NIMH DIR Review of New* Animal Study Proposals for Research Using Nonhuman Primates (NHPs)**

(Must be completed prior to ACUC Review)

Title of Animal Study Proposal (ASP):

(b)(5)

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Review Form

***NIMH DIR Review of New* Animal Study Proposals for Research Using Nonhuman Primates (NHPs)**

(Must be completed prior to ACUC Review)

Title of Animal Study Proposal (ASP):

(b)(5)

Approved April 29, 2016

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(b)(5)

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Review Form

***NIMH DIR Review of New* Animal Study Proposals for Research Using Nonhuman Primates (NHPs)**

(Must be completed prior to ACUC Review)

Title of Animal Study Proposal (ASP):

The causal role of inferior temporal cortex in object recognition

Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Members of Nonhuman Primate Research Review Committee (NHPRRC):

Name (Chair *) Affiliation

Animal Study Proposal Review:

Yes	No	
(✓)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(✓)	( )	The proposed experiments are well designed to address the research questions.
(✓)	( )	Alternatives to animals could not be used.
(✓)	( )	The rationale for the use of NHPs is substantiated.

Discussion Supporting the Committee's Decisions

Decision of NIMH Scientific Director

Based upon the review provided by the NHPRRC, I ( )-Endorse ( )-Do not Endorse this ASP for submission to the NIMH ACUC.

Redacted by agreement

Scientific Director, NIMH

9/18/17

Date

Approved April 29, 2016

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Review Form

***NIMH DIR Review of New* Animal Study Proposals for Research Using Nonhuman Primates (NHPs)**

(Must be completed prior to ACUC Review)

Title of Animal Study Proposal (ASP):

The causal role of inferior temporal cortex in object recognition

Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Name of Reviewer and Title:

Redacted by agreement

Animal Study Proposal Review:

Yes	No	
(x)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(x)	( )	The proposed experiments are well designed to address the research questions.
(x)	( )	Alternatives to animals could not be used.
(x)	( )	The rationale for the use of NHPs is substantiated.

Comments: This is a well-designed study that could only be conducted in primates. The causal studies will not only contribute to understanding object recognition in primates, including humans, but they will also help in assessing the effects of human brain damage, seizure foci, and so on, which has clinical relevance.

Redacted by agreement

Sept 11, 2017

Approved April 29, 2016

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Signature

Date

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Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Name of Reviewer and Title:

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Animal Study Proposal Review:

Yes	No	
(x)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(x)	( )	The proposed experiments are well designed to address the research questions.
(x)	( )	Alternatives to animals could not be used.
(x)	( )	The rationale for the use of NHPs is substantiated.

Comments:

I have read through the protocol and have evaluated the scientific merit of the proposed research. I have reviewed the experimental procedures as they relate to an evaluation of scientific merit. My review does not obviate the need for thorough IACUC review.

The proposed work aims to understand the causal link between brain activity and behavior in the domain of visual object recognition. As the protocol makes clear, among vertebrates, visual object recognition is very well-developed in humans, and serves an essential function in the health and welfare of people. Understanding how object vision works is an important precursor towards the development of medical treatments aimed at repairing the devastating deficits in vision that can accompany a range of pathologies such as stroke and brain tumors, as well as the development of new machine-brain interfaces for the treatment of blindness attributed to peripheral sensory damage. The PI

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has the appropriate training to conduct the work, and the rationale for the experiments is sound. There is high probability that the experiments will yield important new basic knowledge that will advance our understanding of the causal role of brain circuits in bringing about object vision and cognition. Because there are few, if any, other animals besides non-human primates that have object-vision abilities like humans, there are no other animal models for the proposed work. Although many labs are developing mice as a model system for understanding visually guided behavior, mice do not have the same visual acuity as non-human primates, nor do they have the same high-level visual-cognitive abilities as non-human primates. The proposed work is specifically aimed at understanding these high-level abilities; therefore mice (or any other animal model) is not suitable. There is no scientific consensus on how object vision comes about. There are no artificial machines that are capable of the same level of object-detection and discrimination abilities as humans and non-human primates. Moreover, among those artificial systems that achieve some modest success in limited object-vision domains, it is unknown (and probably unlikely) that the human and non-human primate use the same algorithms. Thus it is not possible to conduct the proposed work in artificial (non-animal) systems. The proposed work will lead to the development of new hypotheses about how object vision works, which may one day lead to better AI systems and the ability to conduct some of the research using artificial systems.

Redacted by agreement

August 31, 2017

Signature, Redacted by agreement

Date

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Review Form

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Principal Investigator (Name & Laboratory/Branch):

Redacted by agreement

Name of Reviewer and Title:

Redacted by agreement

Animal Study Proposal Review:

Yes	No	
(X)	( )	The proposed research is scientifically significant and expected to provide knowledge that will improve human and/or animal health.
(X)	( )	The proposed experiments are well designed to address the research questions.
(X)	( )	Alternatives to animals could not be used.
(X)	( )	The rationale for the use of NHPs is substantiated.

Comments:

Use of animals, in general, and NHP, in particular, is well justified. Research plan and rationale is clearly described. Planned studies employ cutting edge methods to ask important questions regarding the neural mechanisms underlying visual sensory processing.

Redacted by agreement

__September _5, 2017____
Date

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