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Avoiding a lost opportunity for psychological medicine: importance of chimpanzee research to the National Institutes of Health portfolio

In November 2015, Dr Francis Collins, the director of the National Institutes of Health (NIH), made the unilateral decision to retire all NIH-owned chimpanzees from biomedical research (http://www.nih.gov/about-nih/who-we-are/nih-director/statements/nih-will-no-longer-support-biomedical-research-chimpanzees). More recently, Dr Collins and the NIH quietly made the decision to limit the types of research with captive chimpanzees that the NIH will fund. Specifically, in the 9 February 2016 Federal Register (http://www.federalregister.gov/articles/2016/02/09/201602554/the-use-of-chimpanzees-in-nih-supported-research), we learned that the NIH will limit even the most minimally non-invasive procedures [e.g. magnetic resonance imaging (MRI) scans or possibly even separating animals temporarily for the administration of cognitive tests]. Unfortunately, these decisions are inconsistent with the Institute of Medicine’s (IOM; Altevogt et al. 2011) report on the value and need of chimpanzees to biomedical and behavioral research as well as the NIH’s own working group (http://grants.nih.gov/grants/guide/notice-files/NOT-OD-12-025.html), both of which highlight the unique value of chimpanzee research to advancing our understanding of human conditions.

Indeed, our research team, as well as others, have demonstrated that chimpanzees are an excellent model species for multilevel behavioral, genetic and neuroscientific research on the pathophysiology of basic transdiagnostic processes (Hopkins et al. 2014; Latzman et al. 2016a, b). These recent decisions will clearly result in lost opportunities for advancing our understanding of the nature, causes, mechanisms and treatments of mental illness, particularly in ways consistent with the recent National Institute of Mental Health (NIMH) Research Domain Criteria (RDoC) Initiative (Insel et al. 2010; Cuthbert & Insel, 2013). We are thus deeply concerned about the consequences of these decisions to severely limit the ability to utilize this invaluable research resource in the future and believe the scientific community needs to voice its concern.

The RDoC Initiative aims to elucidate the neurobiological basis of mental illness through bootstrapping conceptions of psychopathology from an understanding of the neurobiological basis of transdiagnostic behaviors (Insel et al. 2010; Cuthbert & Insel, 2013). As described by Krystal (2016), the study of the neurobiology of behaviors naturally expressed by humans and other species (i.e. neuroethology) represents an important research platform for accessing aspects of the biology of complex behaviors consistent with the RDoC Initiative. Indeed, the RDoC Initiative explicitly encourages investigators to utilize animal models to investigate various constructs within the various specified domains. In our view, chimpanzees represent an unparalleled animal model for such investigations.

Recent work by our research team exemplifies the promise held by research with chimpanzees that falls well within IOM guidelines and follows the goals and aims of the RDoC Initiative. For example, we have found a largely similar, heritable personality structure in chimpanzees that resembles that found in humans (Hopkins et al. 2012; Latzman et al. 2014, 2015a). Variation in chimpanzees’ personality also has parallel neuroanatomical and genetic correlates as those reported in humans (Latzman et al. 2015b); these findings serve to support the cross-species nature of trait personality and the potential mechanisms that underlie their expression. Further, using diffusion tensor imaging (DTI), we (Latzman et al. 2015c) recently examined the relationship between white matter connectivity and delay of gratification (DG) abilities, processes known to prospectively predict a host of problematic outcomes including, potentially most notably, attention-deficit/hyperactivity disorder and substance use disorders. Higher white matter connectivity between the caudate and right dorsal prefrontal cortex (PFC) was associated with individual variation in DG, suggesting the integrity of white matter connectivity between striatal and PFC regions to be critical for inhibitory control. This research has clear translational value to humans with perturbations on this circuit, likely bearing transdiagnostic implications for a variety of behavioral problems characterized by weak inhibitory control.

Lastly, for some phenotypes, chimpanzees are essentially the only alternative model species for comparative studies with humans. For instance, chimpanzees (and perhaps other great apes) have been documented to referentially point, intentionally communicate, and initiate and engage in joint attention during intra- and interspecies communication (Leavens, 2012). Similarly, chimpanzees, but not more distantly related primates, show mirror self-recognition (Anderson & Gallup,
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What is most disheartening is that the vast majority
behavioral, genomic and neuroscience research we
and others have performed falls well within the ethical
framework of scientifically justifiable research with chimpanzees outlined by the IOM as well as the NIH
Working Group. Indeed, some of this work was singled out in the IOM report as being highly transla-
tional and of the highest ethical standards. Indeed, for
procedures such as MRI and positron emission tomog-
raphy (PET) imaging, the chimpanzees are trained to
voluntarily present for a shot for the anesthesia. The
scans are collected at the same time the individuals
are immobilized for their annual veterinary examination, something our group implemented and followed
long before the IOM recommended this as a standard
procedure. Likewise, according to the IOM and NIH
Working Group, administering behavioral or cognitive
tests to captive chimpanzees is inherently enriching,
yet the NIH is proposing to eliminate these procedures
and insisting that only observational methods be used
with chimpanzees.

In summary, if the recent NIH decisions and recom-
mandations remain unchanged, this will clearly result in
lost opportunities for advancing our understanding of
the pathophysiology of psychopathology in humans but
also have a negative impact on the well-being of captive
chimpanzees. Indeed, funds have already been spent to
establish the chimpanzee genome (Chimpanzee Sequencing and Analysis Consortium, 2005) and the
National Chimpanzee Brain Resource (NCR), important
scientific resources in psychological medicine. Further, the
NIH owns and currently supports more than 350 chim-
panzees currently residing in research and sanctuary set-
tings in the USA. It is quite concerning that the NIH
continues to financially support these apes and yet is
putting in place significant limitations to their use in the
types of non-invasive research described here, particularly
when the scientific advancements and benefits that
might come from these efforts are of significant transla-
tional value. The absence of our ability to capture import-
ant phenotypes with which to connect genetic and
neuroanatomical data would be a tragedy particularly in

light of the financial resources already committed and
will be used to maintain the captive chimpanzee popula-
tion for the next 25–30 years. We have an opportunity, and
indeed an obligation, to continue to study chimpanzees
for the purposes of benefitting both human and chimpan-
zee physical and psychological health. This goal can be
accomplished without the use of invasive methods and
by adhering to the highest ethical standards in research with primates. All told, the larger scientific community,
and particularly those committed to elucidating basic pro-
cesses associated with psychiatric health in humans,
should embrace the opportunity we currently have and
take a stand to not allow this amazing resource to be
squandered.

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Declaration of Interest

None.

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