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Open science: International data exchange for sharing primate neuroimaging datasets

The goal of the PRIME-DE[1] data exchange is to make primate brain imaging datasets acquired in laboratories available to the entire scientific community. PRIME-DE was created by an international consortium of 22 teams—including six from the CNRS, INSERM, and the CEA—all working with macaques. Because the brains of macaques are organized so similarly to our own, these animals are crucial to the study of human brain function and pathology. The PRIME-DE initiative, presented in an article published in *Neuron* on September 27, 2018, should enhance the statistical relevance of acquired data and limit the number of animals used in research.

Magnetic resonance imaging (MRI) has become a choice method for brain studies. The noninvasive technique allows for very precise analysis of the organization and functioning (using functional MRI for blood flow measurements) of cerebral structures, and it even enables description of the neuronal networks linking distant regions of the brain.

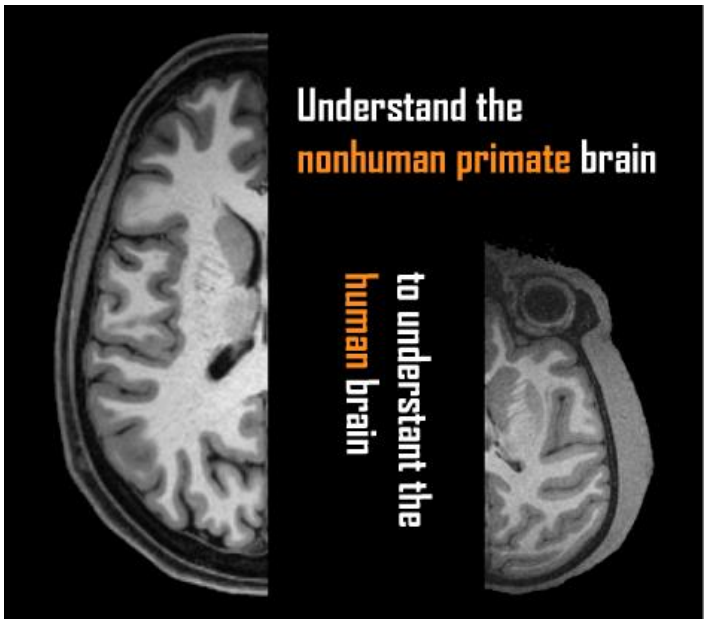
Research on nonhuman primates remains an essential step in advancing neuroscientific knowledge and developing new therapies, because the structure and functioning of these animals' brains are so similar to those of humans. Furthermore, some brain explorations simply cannot be conducted in vitro or in humans. In addition, the quality of MRI data acquired with nonhuman primates may exceed that of data for humans, for whom the use of contrast medium is restricted to medical settings.

Though neuroimaging technology and methodology are advancing in leaps and bounds, research centers working with nonhuman primates—mainly macaques—struggle to acquire cohorts large enough to keep up with these breakthroughs. Accordingly, 22 research teams from seven countries came together to openly share, at no charge, the imaging data they generated in their laboratories. Six of these teams hail from the CNRS, INSERM, and the CEA. The initial release of PRIME-DE, unique in its class, aggregates 25 independent collections of MRI data acquired using 217 macaques. These data are available for any research team that wishes to analyze them, and PRIME-DE is destined to be enhanced over time through new contributions.

The creation of the data exchange should also permit the harmonization of methods applied at different laboratories and the pooling of efforts. Moreover, by reducing the number of research animals needed while improving the quality of experimental procedures, the PRIME-DE initiative is perfectly aligned with 3R (Replacement, Reduction, Refinement) ethical guidelines, which call for (i) replacing the use of animals by other methods when possible, (ii) reducing the number of animals that are needed for experiments when

[1] For "**Prim**ate **D**ata **E**xchange."

not, and (iii) refining experimental procedures. For instance, access to a resting-state functional MRI (fMRI) database obviates the need of certain research teams to conduct new research on animals.



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Explore the data exchange: http://fcon_1000.projects.nitrc.org/indi/indiPRIME.html

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An Open Resource for Non-human Primate Imaging. *Neuron*, 27 September 2018.
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