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Jim DiCarlo is a Professor of Neuroscience, and Director of the MIT Quest for Intelligence at the Massachusetts Institute of Technology. He has training in engineering, medicine, systems neurophysiology and computation from Northwestern and Johns Hopkins. His overall research goal is to discover and artificially emulate the brain mechanisms that underlie human visual intelligence. He has been awarded the Alfred P. Sloan Research Fellowship (2002), the Pew Scholar Award in Biomedical Sciences (2002-2006), and the McKnight Scholar Award in Neuroscience (2006-2009). Over the past 20 years, using the non-human primate model system, DiCarlo and his collaborators have helped developed our contemporary, engineering-level understanding of the neural mechanisms that underlie visual information processing in the ventral stream (a deep stack of cortical neural processing layers) and one of the key behaviors that processing supports — core object recognition.

His group's most recent work is in: building and testing new computational models that are the current leading scientific hypotheses of the neural mechanisms operating along the ventral stream, demonstrating the use of those models to non-invasively control neural activity patterns deep in the brain, causally testing those models using direct neural perturbations (e.g. optogenetics, chemogenetics), and exploring how those neural mechanisms might develop from supervised and unsupervised visual experience. Based on that work and other results in the field, his group is seeking an end-to-end understanding of the neural mechanisms of human visual processing — i.e. from time-varying images to multi-level patterns of neuronal activity to perceptual reports about the world. They aim to use this understanding to guide the development of new artificial vision systems ("AI"), to provide a basis for new neural prosthetics (brain-machine interfaces) to restore or augment lost senses, and to provide a foundation to understand how high-level sensory representations are altered in human conditions such as agnosia, autism and dyslexia.