
New York University

One-shot learning is a critical component of human perceptual reasoning, conferring the ability to survive in environments with limited information and to maximally leverage learned experiences. The mechanisms thought to enable human one-shot perceptual learning, through the use of prior knowledge, are associated with a wide range of psychopathologies including posttraumatic stress disorder, anxiety, and psychosis. Two early career investigators at New York University will use brain surface electrodes to record local activity in neurosurgical patients, and multimodal neuroimaging to gather data from healthy human subjects, while they perform timed visual recognition tasks. They also plan to use advanced artificial intelligence/deep learning techniques to model such processes and use this to study human perception and its pathologies. The two co-investigators provide an unusual combination of expertise to the project: neuroscience, neurosurgery, and computer science. This project may establish a previously unknown, non-hippocampal pathway for human visual learning. The project may also have impact for object recognition for artificial intelligence machine vision and would add useful insights into the possibilities and limitations of such models.

Seattle Children’s Hospital

University of California, Berkeley

An estimated 50,000 medicinal plants may produce more than one million unique natural products, most of which remain scientifically unexplored. Plant natural products could hold the treatment or cure to many untreatable and incurable diseases. However, when it comes to traditional remedies, countries with the empirical knowledge often lack scientific resources, while countries with the resources may lack knowledge. T