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THE PAUL G. ALLEN FRONTIERS GROUP NAMES ICM'S BASSEM HASSAN A NEW ALLEN DISTINGUISHED INVESTIGATOR

New research will explore how developmental noise in neural circuits leads to individual variations in behavior

WASHINGTON, D.C. — March 23, 2016 — The Paul G. Allen Frontiers Group today named Bassem Hassan, Ph.D., at the Institut du Cerveau et de la Moelle épinière (ICM) in Paris an Allen Distinguished Investigator (ADI) with an award for research at the frontier of neural circuit development and behavior, titled "How developmental noise in neural circuit development determines the unique behavior of individuals." His work will seek to solve the long-standing mystery in neuroscience of how variations in individual neural circuits give rise to individual behavioral traits. The grant is funded at $1.5 million over three years.

"The enigma of how variations in individuals is generated, so that evolution can occur via selection of the fittest, has been resistant to modern biological inquiry," says Tom Skalak, Ph.D., Executive Director of The Paul G. Allen Frontiers Group. "Bassem has designed a very creative strategy to uncover for the first time how neural circuitry is sculpted by developmental noise. His work has the potential to shed invaluable light on mechanisms of brain development and evolution."

Even though we all share fundamental neural properties, the details of individual neural circuits can vary dramatically among individuals. Recent research by Hassan suggests that this is due not solely to differences in our genes, but also because of the dynamic way in which our neurons and circuits develop. Scientists have known about circuit structure variability among individuals for some time, but until recently have not been able to ask how those differences arise and how they impact behavior, ultimately laying the groundwork for individual personalities and behavior preferences.

"We know a fair amount about how neural circuitry differs individual to individual, but how this translates to variations in the actual behavioral differences remains a mystery," says Hassan, lead of the brain development team at the ICM. "This award to investigate our new concepts is a great honor and vote of confidence in our ability to understand the roots of personality in neural development."

Hassan has pinpointed a neural circuit in flies called the dorsal cluster neurons (DCN) which is used in tasks involving selective attention such as focusing on a foreground figure against a noisy, moving background. Because this circuit varies not only among individuals but also between the left and right sides of the brain, it is an ideal testing ground for how the structure of the circuit relates to how and when the individual fixates its attention.

"As an organization at the cutting edge of medicine and biology, we are honored to see Bassem Hassan's work recognized with this award," says Gérard Saillant, M.D., President of the ICM. "His work will shed valuable light on an age-old question in neuroscience, with significant impact on the way we think about the brain and development."

"Bassem Hassan, internationally renowned neuro-scientist, has joined the ICM in January 2016, after winning an international call for applicants," says Professor Alexis Brice, General Director of the ICM. "Through his work, Bassem will contribute, alongside with the 650 researchers, engineers and technicians at the Institute, to major advances in understanding the development and functioning of the nervous system. We are proud of the announcement of Bassem's Allen Distinguished Investigator award."

The Paul G. Allen Frontiers Group seeks to open new frontiers in science, and the ADI program supports early-stage research with the potential to reinvent entire fields. Understanding how variability in individual neural circuits gives rise to differences in behavior is a long-standing question in neuroscience. Unraveling the causal link between the dynamic wiring of the brain that takes place over development and the emergence of behavioral variability will shed light on the roots of personality differences and what makes each of us distinct. Further, it will allow new insight into the mechanisms of selection for fitness within a population or to generate sufficient variability across a population to ensure survival.

About The Paul G. Allen Frontiers Group

The Paul G. Allen Frontiers Group is dedicated to exploring the landscape of science to identify and fund pioneers with ideas that will advance knowledge and make the world better. Through continuous dialogue with scientists across the world, The Paul G. Allen Frontiers Group seeks opportunities to expand the boundaries of knowledge and solve important problems. Programs include the Allen Discovery Centers at partner institutions for leadership-driven, compass-guided research, and the Allen Distinguished Investigators for frontier explorations with exceptional creativity and potential impact. The Paul G. Allen Frontiers Group was founded in 2016 by philanthropist and visionary Paul G. Allen. For more information visit allenfrontiersgroup.org.

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