THE PAUL G. ALLEN FRONTIERS GROUP

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THE PAUL G. ALLEN FRONTIERS GROUP ANNOUNCES ALLEN DISCOVERY CENTER AT TUFTS UNIVERSITY

$10 million grant will create Center to read and write the code that controls organ shape in regeneration, growth, and cancer

WASHINGTON, D.C. — **March 23, 2016** — The Paul G. Allen Frontiers Group announced today the creation of an Allen Discovery Center at Tufts University for Reading and Writing the Morphogenetic Code, to be led by Professor of Biology Michael Levin, Ph.D. The Allen Discovery Center at Tufts will focus on learning to read, interpret and manipulate the biological code that determines how tcomplex anatomical structures are created and regulated, with potentially enormous impact for regenerative medicine and bioengineering. The Allen Discovery Center is funded at $10 million over four years, with the potential for $20 million over eight years.

“Regeneration is a mystery of nature with vast unrealized potential,” says Tom Skalak, Ph.D., Executive Director of The Paul G. Allen Frontiers Group. “This new Center holds the promise of defining the systems-level code for shape control throughout life, which will offer tremendous health benefits to humanity.”

While molecular biology has made large strides in understanding how genes determine the behaviors of cells, understanding how complex organs are created, arranged, and repaired also requires investigating the algorithms and computations performed by networks of cells. Levin’s lab has pioneered the study of bioelectric patterning, in which they manipulate the natural ionic signals that cells use to communicate about large-scale shape. Bioelectric information is crucial not just for growing tissues, but for maintaining shape homeostasis throughout life; some animals, such as salamanders, can even regenerate entire limbs, eyes, and hearts. Learning the biophysical language that orchestrates cell functions toward creation and repair of complex anatomies will enable unprecedented control over growth and form.

“Some organisms have already solved the problem of immortality, via continuous self-repair,” says Levin, who holds the Vannevar Bush Chair and directs the Tufts Center for Regenerative and Developmental Biology in the School of Arts and Sciences. “Others can repair limbs throughout their lives. We seek the mechanisms and algorithms that control these incredible processes above the level of the genome code, at the level of tissue information storage and retrieval.”

"We expect this Center to drive a fundamental change in how we investigate, teach and learn the quantitative biological sciences, and how we extend that knowledge," says Tufts President Anthony Monaco, M.D., Ph.D., who also holds faculty appointments in biology and neuroscience. "The creative intersection of disciplines has extraordinary potential for developing innovations and discoveries related to a wide range of human and environmental health problems. If we can unravel the mystery of how organisms develop and control their shapes, we may see significant applications to other biological phenomena, including disorders such as cancer and diabetes, and even further to large-scale, complex systems involving high-level controls above the cellular level."

The goal of the Allen Discovery Center at Tufts University is to understand and eventually manipulate the code that leads to the creation and control of anatomy, with an emphasis on bioelectricity as a large-scale control mechanism. The Discovery Center team will investigate how systems in the body detect damage from injury or disease, compute the steps needed to restore tissues, and decide when to stop growing once the new tissue is in place.

Allen Discovery Centers are a new form of funding for leadership-driven, compass-guided research at the frontier of science. Control over the systems that regulate generation and regeneration of anatomy would transform the fields of biology and medicine, as well as make crucial links in evolutionary theory and cancer biology by bridging the gap between molecular details and the larger scale control of biological systems.

The Allen Discovery Center at Tufts will be located in both existing space and in a new Science and Engineering Complex slated to open in 2017.

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.

About Tufts University
Tufts University, located on three Massachusetts campuses in Boston, Medford/Somerville, and Grafton, and in Talloires, France, is recognized among the premier research universities in the United States. Tufts enjoys a global reputation for academic excellence and for the preparation of students as leaders in a wide range of professions. A growing number of innovative teaching and research initiatives span all campuses, and collaboration among the faculty and students in the undergraduate, graduate and professional programs across the university is widely encouraged.

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