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Honorary Degree Citation Recognizing Charles M. Lieber, Class of 1981

In his search for answers to some of the biggest questions in science and medicine, Charles Lieber '81 works at scales as small as an individual DNA base pair. For more than a decade, the F&M and Stanford University-trained chemist has pioneered the synthesis, assembly and elemental physical properties of nanoscale wires, as well as the field of nano-bioelectronics, which explores the interface between nanoscience and biology and holds the potential to produce breakthroughs in fundamental science leading to revolutionary technologies that improve the quality of people's lives.



Currently the Joshua and Beth Friedman University Professor of Chemistry and Chemical Biology at Harvard University—a department for which he also serves as chair—Dr. Lieber holds a joint position in Harvard's John A. Paulson School of Engineering and Applied Sciences and is the principal inventor on more than 50 U.S. patents. Among his most notable achievements is the development of the first ultrasensitive nanoelectronic sensors capable of real-time detection of cancer markers and viruses.

He also was at the forefront of the creation of a new paradigm for electrical implants called syringe-injectable mesh nanoelectronics, which are advancing brain science by enabling the electronics to integrate seamlessly within the brain without causing damage. This new research could one day lead to powerful therapeutic tools capable of treating diseases such as

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Parkinson's, as well as ameliorating declines in cognitive capabilities that come with natural aging.

Dr. Lieber has done trailblazing work, too, on so-called "cyborg tissues." Half living cells, half electronics, such tissue behaves normally on the cellular side, but on the electronic side actually acts as a sensor network, allowing a computer to interface directly with the cells. In the case of cyborg heart tissue, it already has been shown that the interwoven nanowires can be used to measure the contractions (heart rate) of the cells. Ultimately, the results of this work could inform the development of more biological versions of existing implants such as pacemakers.

Hailed by the Thomson Reuters global media group as the leading chemist in the world for the decade 2000-2010, Dr. Lieber was named the recipient of the international Wolf Prize in Chemistry in 2012. Additional honors include the National Institutes of Health Director's Pioneer Award (2008 & 2017); the Institute of Electrical and Electronics Engineers (IEEE) Nanotechnology Pioneer Award (2013); the Von Hippel Award (2016), the highest honor of the Materials Research Society; and multiple awards from the American Chemical Society.

He is an elected member of the National Academy of Sciences, National Academy of Medicine, American Academy of Arts and Sciences, American Physical Society, International Society for Optical Engineering, American Association for the Advancement of Science, Chinese Academy of Sciences, and IEEE, as well as a fellow of the Materials Research Society, American Chemical Society (inaugural class), and Chinese Chemical Society (honorary). He is also widely admired by his students and colleagues as an outstanding teacher, mentor, and collaborator. His son, Alex, is an alumnus of F&M's Class of 2014.

Charles Lieber, for your groundbreaking work in the fields of chemistry, nanoscience and nanotechnology, for advancing the boundaries of science in the service of mankind, and for continuing to represent the finest ideals of the College as one of its most accomplished graduates, Franklin & Marshall College bestows upon you the Honorary Degree, Doctor of Science.

Charles M. Lieber '81, the Joshua and Beth Friedman University Professor of Chemistry and Chemical Biology at Harvard University



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