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Subra Suresh

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Subra Suresh is the Vannevar Bush Professor of Engineering at the Massachusetts Institute of Technology. He holds joint faculty appointments in Materials Science and Engineering, Mechanical Engineering, Biological Engineering, and Health Sciences and Technology.

The former head of the Department of Materials Science and Engineering, Suresh's current research focuses on the mechanical responses of single biological cells and molecules, and the implications of these responses for human health and diseases. His prior and ongoing work has also led to seminal contributions in the area of nano- and micro-scale mechanical properties of engineered materials. He is the author of over 210 research articles in international journals, co-editor of five books, and co-inventor on fourteen U.S. and international patents. More than 100 students, post-doctoral associates, and research scientists who trained in his group occupy prominent positions in academe, industry, and government throughout the world. He has authored or co-authored three books: *Fatigue of Materials*, *Fundamentals of Functionally Graded Materials*, and *Thin Film Materials*.

He is the recipient of the 2007 European Materials Medal, the highest honor conferred by the Federation of European Materials Societies, and the 2006 Acta Materialia Gold Medal. In 2006, Technology Review magazine selected Suresh's work on nanobiomechanics as one of the top 10 emerging technologies that "will have a significant impact on business, medicine or culture."

Suresh is a member of the U.S. National Academy of Engineering; the American Academy of Arts and Sciences; the Indian National Academy of Engineering; the Academy of Sciences of the Developing World, TWAS, Trieste, Italy; and the German Academy of Sciences Leopoldina. He is also an honorary fellow of the Indian Academy of Sciences, Bangalore, and an honorary member of the Spanish Royal Academy of Sciences. He has been elected a fellow or honorary fellow by all major materials societies in the U.S. and India, including the American Society for Materials International; The Minerals, Metals and Materials Society; the American Society of Mechanical Engineers; the American Ceramic Society; the Indian Institute of Metals; and the Materials Research Society of India.

Suresh received his Bachelor of Technology degree in first class with distinction from the Indian Institute of Technology, Madras, in 1977; his M.S. from Iowa



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State University in 1979; and his Sc.D. from MIT in 1981. After conducting post-doctoral research at the University of California, Berkeley, and the Lawrence Berkeley Laboratory, he joined the faculty at Brown University in 1983. He came to MIT in 1993 as the R. P. Simmons Professor of Materials Science and Engineering.

Selected Publications

1. S. Suresh, "Biomechanics and biophysics of cancer cells," *Acta Biomaterialia*, 3 (2007) 413-438.
2. K. Tai, M. Dao, S. Suresh, A. Palazoglu and C. Ortiz, "Nanoscale Heterogeneity Promotes Energy Dissipation in Bone," *Nature Materials*, 6 (2007) 454-462.
3. Y.K. Park, M. Diez-Silva, G. Popescu, G. Lykotrafitis, W. Choi, M.S. Feld and S. Suresh, "Refractive index maps and membrane dynamics of human red blood cells parasitized by *Plasmodium falciparum*," *PNAS*, 105(37) 13730-13735, 2008.
4. S. Suresh and J. Li, "Deformation of the ultra-strong," *Nature*, 456 (2008) 716.
5. S. Zhang, J. Li, G. Lykotrafitis, G. Bao and S. Suresh, "Size-Dependent Endocytosis of Nanoparticles," *Advanced Materials*, 21 (2009) 419-424.
6. K. Lu, L. Lu and S. Suresh, "Strengthening Materials by Engineering Coherent Internal Boundaries at the Nanoscale," *Science*, 324 (2009) 349.
7. H. Yao, M. Dao, T. Imholt, J. Huang, K. Wheeler, S. Suresh and C. Ortiz, "Protection mechanisms of the iron-plated armor of a deep-sea hydrothermal vent gastropod," *PNAS*, 107 (2010) 987-992.
8. Y.K. Park, C.A. Best, T. Auth, N. Gov, S.A. Safran, G. Popescu, S. Suresh and M.S. Feld, "Metabolic remodeling of the human red blood cell membrane," *PNAS*, 107 (2010) 1289-1294.

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