
BIOGRAPHICAL SKETCH

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NAME Mauro Ferrari, PhD	POSITION TITLE Professor – The University of Texas Health Science Center at Houston President – Alliance for NanoHealth		
eRA COMMONS USER NAME MFERRARI			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Universita' di Padova, Italy	Dottore	1985	Mathematics
University of California, Berkeley, CA	M.S.	1987	Mechanical Engineering
University of California, Berkeley, CA	Ph.D.	1989	Mechanical Engineering
The Ohio State University, Columbus, OH		2002-2004	Medical School

A. MAIN POSITIONS AND HONORS

Positions and Employment:

University of Udine, Italy

1988 – 1990 Assistant Professor (Ricercatore) of Theoretical and Applied Mechanics

University of California, Berkeley, CA

1991 – 1996 Assistant Professor, Materials Science and Civil Engineering

1994 – 1998 Faculty, Bioengineering Program UC San Francisco/Berkeley, and Biophysics Program

1996 – 1998 Associate Professor with Tenure, Materials Science and Civil Engineering;

1996 – 1998 Director, Biomedical Microdevices Center

The Ohio State University, Columbus, OH

1999 – 2005 Professor, Biomedical Engineering and Mechanical Engineering

1999 – 2005 Professor, Internal Medicine, Division of Hematology and Oncology

1999 – 2002 Director, Biomedical Engineering Center

2000 – 2005 Associate Director, Dorothy M. Davis Heart and Lung Research Institute

2001 – 2005 Edgar Hendrickson Designated Chair in Biomedical Engineering

2002 – 2005 Scientific Founder and Scientific Advisor, the Ohio MicroMD Lab

2006 – present Adjunct Professor, Internal Medicine, Division of Hematology and Oncology

Texas Medical Center, Houston, TX

2006 – present Professor, Brown Foundation Institute of Molecular Medicine for the Prevention of Human Diseases, The University of Texas Health Science Center at Houston

2006 – present Professor, Department of Internal Medicine, Division of Cardiology, The University of Texas Health Science Center at Houston

2006 – present Professor, Department of Experimental Therapeutics, The University of Texas M.D. Anderson Cancer Center

2006 – present Adjunct professor, Department of Bioengineering, Rice University

2006 – present President, Alliance for NanoHealth

Main Honors and Professional Service:

1993 – 1998 National Science Foundation – National Young Investigator Award

1997 – present Editor-in-Chief, Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology

1998 – 2000 National Institute of Health – James A. Shannon Director's Award

1999 Wallace H. Coulter Award for Innovation and Entrepreneurship

1998, 2002 Merit Recognitions by Presidents Scalfaro and Ciampi of Italy

Selected State and Federal Advisory Service:

- 1999 National Cancer Institute: Novel Technologies for Noninvasive Detection, Diagnosis, and Treatment of Cancer, Special Emphasis Panel (Chair); Executive Office of the President of the United States of America: Nanotechnology Research Directions: National Science and Technology Council, Committee on Technology, Interagency Working Group on Nanoscience, Engineering and Technology.
- 1999 – 2002 National Research Council's Board on Army Science and Technology: Committee on Opportunities in Biotechnology for Future Army Applications; Materials Research for Defense After Next.
- 2002 – 2003 Chairman, Planning Committee and Working Committee of the National Institute for Heart, Lung, Blood and Sleep (NHLBI), National Initiative on Nanotechnology.
- 2003 – 2005 Member, Integration Committee, Congressionally mandated Army Breast Cancer Research Program, US Department of Defense
- 2003 – 2005 Special Expert on Nanotechnology and Eminent Scholar, The National Cancer Institute.

B. SELECTED RECENT PUBLICATIONS (from over 160 peer-reviewed articles)

1. L.A. Liotta, M. Ferrari, E. Petricoin "Clinical Proteomics: Written in Blood", *Nature* 425, 2003, p. 905.
2. D. Sullivan and M. Ferrari, "Nanotechnology and Tumor Imaging: Seizing an Opportunity", *Molecular Imaging*, Vol. 3, No. 4, 2004, p. 364.
3. P. Decuzzi, S. Lee, B. Bhushan, and M. Ferrari, "A Theoretical Model for the Margination of Particles within Blood Vessels", *Annals of Biomedical Engineering*, Vol. 33, No. 2, 2005, pp. 179-190.
4. M. Ferrari, "Cancer Nanotechnology: Opportunities and Challenges", *Nature Reviews, Cancer*, Vol. 5, No.3, 2005, pp.161-171.
5. F. Martin, R. Walczak, A. Boiarski, M. Cohen, T. West, C. Cosentino, and M. Ferrari. "Tailoring Width of Microfabricated Nano-Channels to Solute Size Can be Used to Control Diffusion Kinetics", *Journal of Controlled Release*, Vol. 102, No. 1, 2005, pp. 123-133.
6. F.J. Martin, K. Melnik, T. West, J. Shapiro, M. Cohen, A.A. Boiarski, and M. Ferrari. "Acute Toxicity of Intravenously Administered Microfabricated Silicon Dioxide Drug Delivery Particles in Mice: Preliminary Findings", *Drug Research and Development*, Vol. 6, No. 2, 2005, pp. 71-81.
7. M. Ferrari, "Nanovector Therapeutics", *Curr. Opin. Chem. Biol.*, Vol. 9, No. 4, 2005, pp. 343-346.
8. M. Ferrari and G. Downing, "Medical Nanotechnology: Shortening Clinical Trials and Regulatory Pathways?" *BioDrugs*, 2005; 19(4): 203-210.
9. C. Cosentino, F. Amato, R. Walczak, A. Boiarski, and M. Ferrari, "A Dynamic Model of Biomolecular Diffusion Through Two-Dimensional Nanochannels", *Journal of Physical Chemistry*, Vol. 109, No. 15, 2005, pp. 7358-7364.
10. V. Cristini, H. Frieboes, R. Gatenby, S. Caserta, M. Ferrari, and J. Sinek, "Morphological Instability and Cancer Invasion", *Clinical Cancer Research*, October 2005, Vol. 11(19), pp. 6772-6779.
11. M. Ferrari, A. Barker, G. Downing, "A Cancer Nanotechnology Strategy", *Nanobiotechnology*, Vol. 1, No. 2, 2005, pp. 129-132.
12. M.C. Cheng, G. Cuda, Y. Bunimovich, M. Gaspari, J.R. Heath, H.D. Hill, C.A. Mirkin, A.J. Nijdam, R. Terracciano, T. Thundat, and M. Ferrari, "Nanotechnologies for Biomolecular Detection and Medical Diagnostic", *Curr. Opin. Chem. Biol.*, Vol. 10, Issue 1, 2006, pp. 11-19.
13. P. Decuzzi, F. Causa, M. Ferrari, and P.A. Netti, "The Effective Dispersion of Nanovectors Within the Tumor Microvasculature", *Annals of Biomedical Engineering*, Vol. 34, No. 4, April 2006, pp. 633-641.
14. M. Gaspari, M.C. Cheng, R. Terracciano, X. Liu, A.J. Nijdam, E. di Fabrizio, E.F. Petricoin, L.A. Liotta, G. Cuda, S. Venuta and M. Ferrari, "Nanoporous Surfaces as Harvesting Agents for Mass Spectrometric Analysis of Peptides In Human Plasma" *Journal of Proteome Research*, Vol.5, No.5, 2006, pp.1261-1266.

15. R. Terracciano, M. Gaspari, F. Testa, L. Pasqua, G. Cuda, P. Tagliaferri, M.C. Cheng, E.F. Petricoin, L.A. Liotta, M. Ferrari, S. Venuta, "Selective Binding and Enrichment for Low Molecular Weight Biomarker Molecules in Human Plasma after Exposure to Nanoporous Silica Particles", *Proteomics*, Vol. 6, Issue 11, 2006, pp. 3243-3250.
16. Geho, M.C. Cheng, K. Killian, M. Lowenthal, S. Ross, K. Frogale, A.J. Nijdam, N. Lahar, P. Herrmann, D. Johann, G. Whiteley, M. Ferrari, E. Petricoin, and L. Liotta, "Fractionation of Serum Components Using Nanoporous Substrates" *Bioconjugate Chemistry*, Vol. 17, No. 3, 2006, pp. 654-661.
17. A.J. Nijdam, M.C. Cheng, R. Fedele, D.H. Geho, P. Herrmann, K. Killian, V. Espina, E.F. Petricoin, L.A. Liotta, and M. Ferrari, "Physicochemically Modified Silicon as a Candidate Substrate for Protein Microarrays" *Biomaterials*, Vol. 28, Issue 3, 2007, pp. 550-558.
18. S. Sandeep, J.K. Sinek, H.B. Frieboes, M. Ferrari, J.P. Fruehauf, and V. Cristini, "Mathematical Modeling of Cancer Progression and Response to Chemotherapy", *Expert Rev. Anticancer Ther.* Vol.6, No.10, 2006, pp.1361-1376.
19. P. Decuzzi and M. Ferrari, "The Adhesive Strength of Non-Spherical Particles Mediated by Specific Interactions", *Biomaterials*, 2006, 27(30): pp. 5307-1534. Epub 2006 Jun 23.
20. F. Amato, C. Cosentino, S. Pricl, M. Ferrone, M. Fermeglia, M.M. Cheng, R. Walczak, and M. Ferrari, "Multiscale Modeling of Protein Transport In Silicon Membrane Nanochannels. Part 2. From Molecular Parameters to A Predictive Continuum Diffusion Model", *Biomed Microdevices*. 2006; 8(4): pp. 291-298.

PATENTS (from 29 issued)

1. Ferrari M. Therapeutic Microdevices and Methods of Making and Using Same, U.S. Patent No. 6,107,102, 8/22/00.
2. Martin F, Ferrari M, Grove C. Particles for the Oral Delivery of Peptides and Proteins, European Patent No. 00903159.2-2114, 8/24/01.

C. RESEARCH SUPPORT – FROM A CAREER TOTAL OF OVER \$30 MILLION

Ongoing Research Support

1 R21 CA122864-01 (Ferrari)

09/21/2006 – 08/31/2007

NIH Nanoparticles for Harvesting and Targeting Angiogenic Proteins

This project's goal is to develop refining tools for detection of angiogenic proteins for selective targeting and destruction of tumor-associated blood vessels.

Role: PI

SA23-06-017 (Ferrari)

09/01/2006-08/31/2009

NASA NSPIRES

Nanotechnology for space medicine

This projects' goal is to develop the diagnostic and therapy tools for long-term clinical care for astronaut space missions.

Role: PI

W81XWH-04-2-0035 (Casscells)

09/15/2005 – 09/14/2007

DoD/T5

Engineered Nanoparticles for Delivery of Chemotherapeutic Agents

This funding is for establishing the initial laboratory infrastructure (hiring of key personnel, analytical tools, supplies, etc.) at The University of Texas Health Science Center at Houston to carry out research in military medicine related to cancer.

Role: Co-PI

EEC-0425626 (Lee)

09/01/2004 – 08/31/2009

NSF Division of Engineering, Educational and Centers Administration

Nanoscale Science and Engineering Center for Affordable Nanoengineering of Polymer Biomedical Devices

This projects' goal is the development of near-term and long-term biomedical devices using polymer nanofabrication and nanofluidic techniques.

Role: Co-PI

Completed Research Support, Since 2000

Defense Advanced Research Projects Agency (DARPA) [2000-2003]

Experimental and Theoretical Development of Bio-Fluid Transport Models through Nano- and Micro-fluidic Component (With Derek Hansford, PI)

The primary objectives of this project were the fabrication of nanochannels, and the development of mathematical models for mass transport within them.

Role: Co-PI

State of Ohio Technology Action Fund (2002-2003)

OSU's Science and Technology Campus Corporation, and iMEDD, Inc.

"Ohio MicroMD Lab", Biomedical Engineering Center

The objects of this grant were to provide baseline support to the Ohio MicroMD core medical nanotechnology facility, and personnel support for joint research project among the participants.

Role: PI

BRTT02-0001 (02/02/2003 – 07/31/2006)

Biomedical Research and Tech Transfer Commission, State of Ohio

Cardiovascular Bioengineering Enterprise Leadership Core:

Therapeutic Nanotechnology Smart Release Implants

Multifunctional Particles for the Targeted Delivery of Therapeutic and Imaging Agents to Tissues and Stents

Advanced Cardiovascular Imaging for Detection of Coronary Artery Disease

This awards supports laboratory and clinical research aimed at the development of nanotechnology-based, novel diagnostic and interventional approaches for coronary artery disease.

Role: PI

1 R21/R33 CA099089-01(06/2003 - 05/31/2005)

NIH/NCI

Nanomechanical Method for Molecular Analysis of Cancer

This project's aims are the development and validation of a novel, nanoparticle-mediated platform for the automated, high-throughput identification of neoplastic lesions from breast tissue samples.

Role: PI

HSK 5/21/02 (07/2003 - 06/2004)

Hope Street Kids

Nanoengineered Devices for the Oral Delivery of Analgesia in Pediatric Oncology

This project supported the development of the design of a nanotechnology-based device for the delivery of analgesia for rapid-onset breakthrough pain in pediatric oncology.

Role: PI

BES-0340999 (2004)

NSF Division Bioengineering and Environmental

Nanotechnology in Advanced Therapy and Diagnosis, Yokohama, Japan

This grant supported the USA delegation that met with a Japanese counterpart in a workshop in Yokohama, to develop strategic initiatives in medicinal nanotechnology.

Role: PI

N01-CO-12400 (02/2004 – 4/2006)

SAIC

Nanotechnology Program Development for NCI – Research Projects at MicroMD

The major research goals of this project are the development of nanostructured surfaces for the selective capture and concentration of low-molecular weight proteolytic fragments for the early detection of cancer from serum samples. Role: PI