

Curriculum Vitae

Andreas Mershin, Ph.D.

Research Scientist,
Director, Label Free Research Group

Massachusetts Institute of Technology,

Center for Bits and Atoms

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Education

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| 1997 | M. Sci, Physics Thesis: Computer Simulation of Cosmic Microwave Background Anisotropies Advisor: Prof. Andy Albrecht | Imperial College of Science, Technology and Medicine, University of London, UK |
| 2000 | M.S., Physics Thesis: Quantum Physics Motivated Neurobiology Advisor: Distinguished Prof. Dimitri V. Nanopoulos | Texas A&M University, USA |
| 2003 | Ph.D. Physics Dissertation: Tubulin in Vivo, in Vitro and in <i>Silico</i> Advisor: Distinguished Prof. Dimitri V. Nanopoulos | Texas A&M University, USA |
| 2003-2004 | Postdoctoral Fellow, Physics PIs: H.A. Schuessler & D.V. Nanopoulos Biophysics instrumentation and microfluidics for cytoskeleton and fibrous protein studies | Texas A&M University, USA |
| 2004-2008 | Senior Postdoctoral Associate, Center for Biomedical Engineering PI: Shuguang Zhang Automation, biophotovoltaics, protein electronics, label- | Massachusetts Institute of Technology, USA |

free molecular interaction instrumentation, machine olfaction.

Academic Positions:

2008-2010 Project Manager, Lead co-PI DARPA-MITRealNose, Center for Biomedical Engineering, MIT

2008-2011 Research Scientist, Center for Biomedical Engineering, MIT

Current Appointments

2011-present Research Scientist, Director Label-Free Research Group. Center for Bits and Atoms, MIT.

2014- present Executive Education Instructor MIT Sloan School of Management: "*Lab to Market the MIT Way*"

Professional Memberships:

American Physical Society (2003-), Sigma Xi Scientific Research Society (2003-), Aircraft Owners and Pilots Association (2003-), Associate of the Royal College of Science (1997-)

Entrepreneurship, Leadership, Service:

2005-2007 Co-founder & Lead Organizer, [Hellenic Business Network Big Idea Competition](#) (Advisor (2007-2009))

2005- Co-founder, Law and Liability Officer (Aircraft Procurement) and Staff Advisor to [MIT Flying Club](#): [MIT Campus Aerial Photography](#), [Helicopter Rides for MIT Students](#)

2006-2015 Science consultant to MIT 100K teams:
[Tree Power Inc.](#), (bioenergy harvesting, mesh-networked climate sensing became VoltreePower) BioBit/FitGain (quantified self wearable biosensing -became FitBit), LiveTrack (machine learning for internet traffic trend mining), AntiDark(distributed, scalable solar hextiles: MIT100K Accelerate Phase Business Idea Plan Competition winner 2015 & Mass Challenge summer startup incubator winners 2015),
Scientific Advisor to Minder (wearable EEG neurofeedback for meditators - Cornell Business Plan Competition \$3K winner)

2006- [Co-founder and Director of the International Molecular Frontiers Inquiry Prize](#) for youth, the world's first prize awarded for questions, [supported](#) by the [The Royal Swedish Academy of Sciences](#) and the [Nobel Foundation](#). ([molecularfrontiers.org](#) and [mfinquiryprize.org](#))

2006 [Youth Mentoring at MIT Chapter of Molecular Frontiers](#)

2006 MIT Youth Guest Lecture Series Organizer: [Benoit Mandelbrot and Fractals](#)

2008-2011 Co-founder and science advisor, [Voltree Power LLC](#)

2009 Co-organizer, speaker, selection committee member of the "Membrane Protein Frontiers" International Workshop, Mykonos, Greece

- 2014- Co-founder Resonant Brain Dynamics/MindBoostr.com (non-medical applications of Self-Calibrating Protocols to wearable EEG neurofeedback)
- 2014 Co-organizer, speaker, selection committee member "[Bits <-> Biology](#)" CBA @ MIT May 1-2 2014
- 2015- Founder: Label Free Research [Guest Lecture Series](#) and CBA Journal Club organizer
- 2016- Advisor, [Envision Princeton Conference](#)
- 2017- Advisory board member, [Zino Ventures](#)
- 2018- Expert consultant, [Medical Detection Dogs](#) "Canine olfactory detection of human colorectal cancer in urine and fecal samples" UK Bowel and Cancer Research
- 2018- volunteer advisor MindScreen, Auckland, New Zealand
- 2018- co-Founder, & Director, QAward, New Zealand

Honors:

- 2001 1st place, poster competition, Texas A&M Univ. Graduate Student Research Week: "Biological (qu)bits: theory and experiment"
- 2003 Winner, Best Business Idea (\$1k). Texas A&M Univ. Center for New Ventures and Entrepreneurship, Business Idea Competition for entry "Portable Braille"
- 2004 Scholar of the A.S. Onassis Public Benefit Foundation -awarded for academic and research excellence.
- 2008 Young Researcher Award administered by Chemistry Nobel Laureate Sir Harry Kroto and EU Science Commissioner Andreas Mitsios (2008)
- 2008 Invited Young Scientist, 58th Meeting of Physics Nobel Laureates at Lindau, Germany

Peer-Reviewed Publications

A. Mershin, D.V. Nanopoulos & E.M.C. Skoulakis. *Quantum Brain?* PROC. ACAD. ATHENS, 74 A (1999)

N.E. Mavromatos, **A. Mershin** & D.V. Nanopoulos. [QED-Cavity model of microtubules implies dissipationless energy transfer and biological quantum teleportation](#) INT. J. MODERN PHYSICS B, 16, No. 24 3623-3642 (2002)

H.A. Schuessler, **A. Mershin**, A.A. Kolomenski & D.V. Nanopoulos. [Surface plasmon resonance study of the actin-myosin sarcomere complex and tubulin dimer](#), J. MODERN OPTICS, 50 No. 15-17, 2381-2391 (2003)

A. Mershin, E. Pavlopoulos, O. Fitch, B.C. Braden, D.V. Nanopoulos & E.M.C. Skoulakis. [Learning and memory deficits upon TAU accumulation in Drosophila mushroom body neurons](#). LEARNING & MEMORY, May-June; 11(2):277-287 (2004)

A. Mershin, A.A. Kolomenski, H.A. Schuessler & D.V. Nanopoulos. [Tubulin dipole moment, dielectric constant and quantum properties: computer simulations, experimental results and suggestions](#). BIOSYSTEMS, 77:73-85 (2004)

V. Lioubimov, A.A. Kolomenski, **A. Mershin**, D.V. Nanopoulos, & H.A. Schuessler. [*The effect of varying electric potential on surface plasmon resonance sensing*](#) APPLIED OPTICS June 10, 43, No 17 (2004)

D. Toback, **A. Mershin** & I. Novikova [*Integrating web-based teaching tools into large university physics courses*](#) THE PHYSICS TEACHER, 43, 594-597 (2005)

H. Sanabria, J.H. Miller, **A. Mershin**, R.F. Luduena, A.A. Kolomenski, H.A. Schuessler & D.V. Nanopoulos. [*Dielectric spectroscopy of \$\alpha\beta\$ -tubulin heterodimer*](#) BIOPHYSICAL JOURNAL 90:4644-4650 (2006)

Love, C., Zhang, S., **Mershin, A.** [*Source of Sustained Voltage Difference between the Xylem of a Potted Ficus benjamina Tree and Its Soil.*](#) PLoS ONE 3(8): e2963 (2008)

Franco, MI., Turin, L., **Mershin, A.**, Skoulakis E.M.C., [*Molecular vibration sensing component in Drosophila melanogaster olfaction.*](#) PNAS March 1, vol. 108 no. 9 3797-3802 (2011)
Highlighted on date of online pub (02/14/2011) by both NATURE [*Flies Sniff Out Heavy Hydrogen*](#) and SCIENCE: [*Do Vibrating Molecules Give Us Our Sense of Smell?*](#)

Franco, MI., Turin, L., **Mershin, A.**, Skoulakis E.M.C., Reply to Hettinger: [*Olfaction is a physical and a chemical sense in Drosophila*](#) PNAS August 2, Vol. 108 no. 31 (2011)

Mershin, A., Matsumoto, K., Kaiser, L., Yu, D., Vaughn, M., Bruce, D., Graetzel, M., & Zhang, S. [*Self-assembled photosystem-I biophotovoltaics on nanostructured TiO₂ and ZnO.*](#) Nature Scientific Reports, 2, doi:10.1038/srep00234 www.nature.com/articles/srep00234 (Feb 2 2012)

T. Karydis, F. Aguiar, S. L. Foster, and **A. Mershin.** [*Performance characterization of self-calibrating protocols for wearable EEG applications.*](#) PETRAe Conf. Proc., ISBN: 978-1-4503-3452-5 doi>[10.1145/2769493.2769533](#) Proceedings of the 8th ACM International Conference on Pervasive Technologies Related to Assistive Environments Article No. 38 (2015)

T. Karydis, F. Aguiar, S. L. Foster, and **A. Mershin.** [*Self-Calibrating Protocols as diagnostic aids for personal medicine, neurological conditions and pain assessment.*](#) PETRAe Conf. Proc., ISBN: 978-1-4503-4337-4 doi>[10.1145/2910674.29358522016](#) Proceedings of the 9th ACM International Conference on Pervasive Technologies Related to Assistive Environments Article No. 61 (2016)

Thrasylvoulos Karydis, Samuel Langer, Simmie L. Foster, and **Andreas Mershin** [*Identification of post-meditation perceptual states using wearable EEG and Self-Calibrating Protocols.*](#) In PETRA '18: The 11th Pervasive Technologies Related to Assistive Environments Conference, June 26–29, 2018, Corfu, Greece. ACM, New York, NY, USA, <https://doi.org/10.1145/3197768.3201544>

James F. Pelletier, Lijie Sun, Kim S. Wise, Nacyra Assad-Garcia, Bogumil J. Karas, Thomas J. Deerinck, Mark H. Ellisman, **Andreas Mershin** Neil Gershenfeld, Ray-Yuan Chuang, John I.

Glass, Elizabeth A. Strychalski. *Genetic basis for variation of cell size and shape in minimal cells Technologies* (in review Cell July 2018)

F.Tourlomousis, C.Jia, T.Karydis, **A.Mershin**, H.Wang, D.M. Kalyin, R.C Chang *Machine Learning Metrology of Cell Confinement in Melt-Electrowritten 3D Biomaterial Substrates* (submitted Nature Microsystems and Nanoengineering submitted Aug. 2018)

Andreas Mershin, George Church, and Kate Adamala *The Prospects of Synell Technologies* (in preparation for submission to Nature Biotechnology Aug 2018)

Sivan Kaminski, Dvir Schirman, {...} Kate Adamala, Simmie Foster, Shannon Johnson, **Andreas Mershin**, Orna Dahan & Yitzhak Pilpel. "[*Evolthon: a community endeavor to evolve lab evolution*](#)" (in preparation for submission to PLoS Biology Aug 15 2018)

List of Published Work in NIH format "My Bibliography":

http://www.ncbi.nlm.nih.gov/sites/myncbi/1tkVX7_YAFNkg/bibliography/46207595/public/?sort=date&direction=descending

Book Chapters

Mershin A., & Nanopoulos D.V., [*Memory depends on the cytoskeleton but is it quantum?*](#) **Chapter 7** of [QUANTUM ASPECTS OF LIFE](#) ed. Davies, P. Imperial College Press ISBN: 978-1-84816-253-2 (2008)

Renugopalkrishnan, V., Kannan, A.M., Srinivasan S., Thavasi, V., Ramakrishna, S., Li, P., **Mershin, A.**, Filipek, S., Kumar, A., Dutta, J., Jaya, A., Munukutta, L., Velumani, S. and Audette, G.F. *Nanomaterials for Energy Conversion Applications* pp 1-24 in NANOMATERIALS FOR ENERGY STORAGE APPLICATIONS; ed. Nalwa H.S., ISBN: 1-58883-120-5 (2008)

A. Mershin, H. Sanabria, J.H. Miller, D. Nawarathna, E.M.C. Skoulakis, N.E. Mavromatos, A.A. Kolomenski, H.A. Schuessler, R.F. Luduena & D.V. Nanopoulos [*Towards experimental tests of quantum effects in cytoskeletal proteins*](#) THE EMERGING PHYSICS OF CONSCIOUSNESS Springer-Verlag Berlin, Heidelberg, New York, ISBN-13-9783540238904 Chapter 4: 95-170 (2006)

Invited Publications:

D. Toback, **A. Mershin** & I. Novikova [New Pedagogy for Using Internet-Based Teaching Tools in Physics Courses](#), e-print <http://xxx.lanl.gov/abs/physics/0408034> (2004)

A. Mershin, B. Cook, L. Kaiser & S. Zhang. [A classic assembly of nanobiomaterials](#) NATURE BIOTECHNOLOGY, 23 No. 11: 9-10 (2005)

Mershin A., [We Need a Nobel prize for Kids](#). Op. Ed. NEW SCIENTIST April 29th (2008) http://www.newscientist.com/article/dn13798-comment-we-need-a-nobel-prize-for-kids.html?DCMP=ILC-hmts&nsref=spectrt10_pic

Keynote, Plenary, Invited

- “How to grow BioFabLabs Using Mycotecture & Bioterials” FabLab ChCh & Institute of Canterbury, Ara City Campus, Department of Science and Primary Industries, Christchurch, New Zealand (7/28/2018)
- “Nanonose: Design the Experience, Not the Features -Cross-Disciplinary Research Applications” hosted by Canterbury Angels, Christchurch, New Zealand (7/27/2018)
- “Nobel for kids-QAward: Curiosity as a Honeable Skill” Rangitoto College, Auckland, New Zealand (7/26/2018)
- *Invited Talk:* “[BioFab/BioHab: bioterials and mycotecture](#)” TechFutureLab, Auckland, New Zealand (7/26/2018)
- *Invited Seminar:* “Genomic and structural evidence for a neuro-immune system analogue in deep sea sponges” Natural History Museum Invertebrates Division, Department of Life Sciences, London, UK (6/8/2018)
- *Invited demonstration:* “[Medical Detection Dogs -a Jewel in the Crown of British Science](#)” nanonose prototype presentation to HM Queen Elizabeth II, Royal Mews, Buckingham Palace, London, UK (6/6/2018)
- *Invited Lecture:* “I Thought I Understood Vision Until I Looked at Olfaction” Department of Experimental Psychology, University of Oxford, Oxford, UK (6/5/2018)
- *Invited Outreach Lecture:* “Microscopy and Curiosity” Haynes Early Education Center Roxbury, MA, USA (03/27/2018)
- *Hosted:* “Human, Machine and Canine Olfactory Training for Prostate Cancer Diagnostics” Prostate Cancer Foundation, Medical Detection Dogs, Label Free Research Group MIT, Cambridge, MA, USA (02/27/2018)
- *Invited Profile:* “[Solutions to x: researching across disciplines](#)” Industrial Liaison Program, MIT, Cambridge, MA, USA (02/18/2018)
Text: <http://ilp.mit.edu/newsstory.jsp?id=24093>
Accompanying Videos:
[Why a “Label Free” Research Group](http://ilp.mit.edu/videodetail.jsp?id=2344) (<http://ilp.mit.edu/videodetail.jsp?id=2344>)
[Detecting Early Signs of Cancer](http://ilp.mit.edu/videodetail.jsp?id=2345) (<http://ilp.mit.edu/videodetail.jsp?id=2345>)
[Deviating from Traditional Pharma](http://ilp.mit.edu/videodetail.jsp?id=2346) (<http://ilp.mit.edu/videodetail.jsp?id=2346>)
[Exploration and Curiosity as Technical Skills](http://ilp.mit.edu/videodetail.jsp?id=2347) (<http://ilp.mit.edu/videodetail.jsp?id=2347>)
[Balancing Academia and Industry](http://ilp.mit.edu/videodetail.jsp?id=2348) (<http://ilp.mit.edu/videodetail.jsp?id=2348>)
[The Evolving Field of Health and Pain Management](http://ilp.mit.edu/videodetail.jsp?id=2349) (<http://ilp.mit.edu/videodetail.jsp?id=2349>)
- *Invited Talk:* “Multisensory Perceptual Engineering –EEG and AR/VR Wearables” Media Lab Fluid Interfaces Research Group, MIT, Cambridge MA, USA (01/18/2018)
- *Invited Video Talk:* “[Label-Free” P61 VMag](#): Pioneers of Interdisciplinary Innovation Issue 05 www.proj61.com/vmag (12/14/2017)
- “[Smelling skin cancer with your smartphone](#)” NZTV (11/30/2017)
- *Invited Lecture:* “VR and Wearables for Perceptual Engineering: Pain, Olfaction and Mental Health” University of Auckland Dept of Psychological Medicine, Auckland New Zealand (11/29/2017)
- *Invited Lecture:* “Perception Engineering via Personalized Machine Learning EEG Neurofeedback”, Waikato University School of Engineering, Hamilton, New Zealand (11/27/2017)

- *Keynote: "Deploy for Impact, Adapt for Income"* StartupFest, Zino Ventures, Auckland, New Zealand (11/24/2017)
- *Invited Lectures: "Build it to Understand It: MIT's Global Impact"* Callaghan Innovation & *"When Structure Isn't Function: the Global Pharma Crisis"* Victoria University Wellington, New Zealand (11/23/2017)
- *Invited Masters Talk: "Make and Deploy for Impact: Motifs of the MIT Way"* MindLab & TechFutureLab, Auckland, New Zealand (11/22/2017)
- *Invited Talk: "Curiosity Is A Superpower"* [TEDx Beacon St](https://www.youtube.com/watch?v=7bootfdk7ZQ) MA, USA (11/04/2017)
<https://www.youtube.com/watch?v=7bootfdk7ZQ>
<https://www.youtube.com/watch?v=8LRjbYmCJwM>
- *Invited Lecture: "Advances in NanoBioTech"* Industrial Liaison Program, MIT, MA, USA (10/18/2017)
- *Invited Lecture: "Beyond the Dog's Nose"* [Medical Detection Dogs](#), Milton Keynes, UK (07/21/2017)
- *The Dave Kelly Keynote Lecture: "Molecular Phrenology"* UK Semiochemistry Network, Gonville and Caius College, University of Cambridge, Cambridge, UK (07/18/2017)
- *Invited Lecture: "Protein Electronics Science and Bionanotechnology"*. Communication in Biology Systems and Applications in Bionanotechnology, University of Patras, GREECE (06/28/2017)
- *Invited Lecture: "Self Calibrating Protocols (SCP) for Wearables and Personalized Machine Learning"* [The 10th ACM International Conference on Pervasive Technologies Related to Assistive Environments, Rhodes](#), GREECE (06/23/2017)
- *Invited Lecture: "Membrane Proteins: The Trillion Dollar Space Between Wet and Dry"*. Naval Underwater Warfare Center, Newport, RI USA (4/19/2017)
- *Invited Lecture: "Role of Curiosity in Research and Technology"* Consciousness Hacking: Meditation, Neuroscience and Technology Symposium. Harvard Divinity School, Cambridge, MA USA [youtube.com/watch?v=giphnnBvxRE](https://www.youtube.com/watch?v=giphnnBvxRE) (3/30/2017)
- *Invited Lecture: "BioNanoTechnology of membrane proteins: from scents to cures"* [Epoch Foundation](#), TSMC & MediaTek Taipei, TAIWAN, (11/9/2016)
- *Invited Lecture: "Future of Wearable Biosensors (wearable personalized machine learning and EEG)"* [Mayorty of Wuxi](#), CHINA (11/7/2016)
- *Invited Nanotechnology Keynote: "Unlocking the Nanoscale"*. Princeton Envision Conference, Princeton, NJ, USA www.youtube.com/watch?v=c0s6sQacqaE (12/2/2016)
- *Invited Seminar: "Olfaction: A Scientific Goldmine"* Olfaction Research Group, Weizmann Institute of Science, Department of Neurobiology, ISRAEL (11/2/2016)
- *Invited Keynote: "Drowning in 'Omes"*, Monsanto Science Fellows Symposium, Chesterfield MO USA (4/13/2016)
- *Plenary Lecture: "From Olfaction to Pharma"*, Monsanto Science Fellows Symposium Chesterfield MO USA (4/14/2016)
- *Invited Lecture: "Beyond Structure-Function: the Science and Bio-nano-technology of Membrane Proteins"*. Bioorganic Chemistry Seminar, Russian Academy of Sciences. Lomonosov University, Moscow, RUSSIA, (12/28/2015)
- *Invited Outside Lecture: "Drug Discovery Through The Nose"* GlaxoSmithKline Science Week, Stevenage, UK (10/8/2015)

- *Exhibits and Invited Lectures "Distributed Solar Hextiles", "Modular Microfluidics" "Personalized Machine Learning for EEG Wearables"* MIT-China Wuxi Conference Jiangsu Province, CHINA (05/22-24/2015)
- *Invited Talk: "Biomolecular Recognition"*. [CBA Bits<-> Bio Conference](https://www.youtube.com/watch?v=raS_PWgk_iI). MIT, Cambridge, MA USA (5/1/2014) https://www.youtube.com/watch?v=raS_PWgk_iI
- *Invited Talk: "Bio Nano Technology-New Frontiers in Molecular Engineering"* [TEDx-Athens](https://www.ted.com/talks/andreas-mershin-bio-nano-technology-new-frontiers-in-molecular-engineering), GREECE (11/24/2012)
- *Invited Lecture: "Nature's Templates"* University of Pennsylvania, Department of Physics, Philadelphia, USA (08/15/2011)
- *Invited Lecture: "Bio-Nano-Materials"* National Center for Nuclear Research EKEFE Demokritos, Athens GREECE (11/30/2010)
- *Invited Lecture: "Bioenergy harvesting and protein-based sensing"*. IDTechEx Energy Harvesting and Wireless Sensors Conference, Cambridge USA (11/17/2010)
- *Invited Panel: "In-Field Fabrication of Bio-Photovoltaics"* Pune FAB5: Fifth International Fab Lab Forum and Symposium on Digital Fabrication, INDIA (via satellite link) (08/20/2009)
- *Keynote Lecture: "Bio-Nano-Mechanics: Using Nature's Templates"* Technological University of Monterrey, 7th International Congress on Mechatronics Engineering, Monterrey, MEXICO (03/27/2009)
- *Invited Lecture: "[Quantum Brain?](https://www.youtube.com/watch?v=raS_PWgk_iI)"* Boston Skeptics in the Pub, Cambridge, MA USA (01/26/2009)
- *Invited Panel: "Flexible BioPhotoVoltaics Manufacturing"* Leaders for Manufacturing MIT Sloan School of Business. Cambridge, MA USA (11/06/2008)
- *Invited Lecture: "Self-assembled, bio-engineered photovoltaics and other applications of bio-nano-tech"* Alexander Fleming Institute: Vari, GREECE (06/25/2008)
- *Plenary Lecture: "Bio-Engineered Photosystem-I Sensitized Solar Cells on Nanostructured TiO₂ and ZnO Photoanodes"* 1st Int. Conf. on Nanoparticles, Nanomaterials Nanodevices and Nanosystems, Chalkidiki, GREECE (06/17/2008) and *Biological Memory Depends on the Cytoskeleton but is it Quantum?* Chalkidiki, GREECE (06/16/2008)
- *Invited Presentation: "Membrane protein photovoltaics"* Biological Engineering Department MIT, Cambridge, MA, USA (11/20/2007)
- *Invited Lecture: "From patent to market: a guide for startups"*. Consulate General of Greece. Boston, MA USA (11/19/2007)
- *Invited Technology Presentation: "Early Wildfire Alert Network"*. USDA Forest Service, National Interagency Fire Center, Boise, Idaho, USA (08/13/2007)
- *Invited Panel: "Bio-Sensitized Solar Cells on ZnO nanowires"* Intel™ Power-Plus Forum: INTEL HQ, Portland, Oregon, USA (08/10/2007)
- *Invited Presentation: "Biosensing Devices"* ROHM™ Kyoto, JAPAN (08/02/2007)
- *Invited Lecture: "Stabilized Membrane Proteins for Energy and Sensing Applications"* NOKIA™, Helsinki, FINLAND, (07/17/2007)
- *Invited Talk: "Bottom-up Nano-biotechnology"* Center for Bits and Atoms, Media Lab, Massachusetts Institute of Technology, Cambridge, MA, USA, (10/12/2006)
- *Keynote Lecture: Bio Nano Materials for Energy Applications: Joint 8th International Symposium on Hydrothermal Reactions & 7th International Conference on Solvo-Thermal Reactions*, Sendai, JAPAN (08/07/2006)

- *Plenary Lecture: "Photosystem-I Biosolar"* The Protein Society 19th Symposium, Boston, USA (03/13/2006)
- *Invited Technology Presentation: "Protein-based nanowire photovoltaics"* Delta Electronics, Taipei, TAIWAN (07/30/2005)
- *Invited Lecture: "Quantum biophysics: testing a controversial hypothesis"*s Research for Undergraduates (RUG) program, Texas A&M Univ. College Station, TX USA (06/17/2003)
- *Plenary Lecture: "Experimental quantum brain?"* Quantum Mind 2003 Conference, Univ. of Arizona Tucson, AZ, USA (03/15/2003)

Contributed Talks/Seminars

- *"Battery-less remote sensing and mesh-networked forest wildfire protection -E.W.A.N."* Hellenic Technology Cluster Initiative (Ministry of Development) GDT/Corallia, Athens, GREECE (06/13/2008)
- *"Bio-Nanotechnology: integrating membrane proteins with electronic circuits"* Seminar: National Technical University of Athens, GREECE (10/16/2007)
- *"Biomimicry in nanotechnology"* Marine Biology Institute, Heita-Kamaishi, JAPAN (03/12/2005)
- *"Photosynthetic electric power* RIKEN, Yokohama, JAPAN " (03/10/2005)
- *"Peptide-assisted bio-nanodevices"* Center for Astrophysics, Harvard University, Cambridge, MA, USA (02/25/2005)
- *"Biological Engineering of Peptide-Stabilized Membrane Protein Chips"* Massachusetts Institute of Technology, Cambridge, MA USA (12/09/2004),
- *" Bio(qu)bits: theory, simulation and experiment"* Centre for Structural Biology, Imperial College of Science, Technology and Medicine, Univ. of London, UK (02/20/2004)
- *"Biomolecules as substrates for classical and quantum computation"* Joint NSF/DARPA PI meeting, Ft. Lauderdale, FL USA (05/15/2003)
- *"Directed overexpression of vertebrate tubulin in Drosophila mushroom bodies causes neuroplasticity decrement in olfactory associative memory"* Texas A&M Univ. Center for Advanced Invertebrate Molecular Neurobiology, USA (05/01/2001)
- *"Biophysics of the cytoskeleton"* Houston Advanced Research Center (HARC), USA (11/28/2000)

Invited Posters/Abstracts

- *Invited Abstract and Poster: "A Scientific Payload for Investigations of RNA Folding, Synthetic Protocell Protein Expression, and Pharmaceutical Nano-Precipitation"* Bense N, Gilstrap A, Buchman Z, Galles M, Robinson R, Borden M, Certain E, Lambert R, Gordillo O, Nakonechnya O, Tournomousis F, Lai D, Adamala K, Engelhart A, **Mershin A.** NASA American Institute of Aeronautics and Astronautics Hampton Roads Section Student Research Spring Forum Hampton, VA (3/29/2018) -*Payload launched successfully June 21 2018*
- *Invited Abstract: "Synnels, Microfluidics and 3D Bioprinting"* **Mershin, A.** Build-a-cell Workshop #2 Stanford University, Palo Alto, CA, USA (02/02/2018)
- *Invited Poster and Prototype Demonstration: "Temporal Stereoscope"* Michael Skuhersky & Andreas Mershin TEDx Beacon St. MA, USA (11/4/2017)

- *Invited Abstract: "Shifted-Wavelength Photosynthesis for Biomass Production"* Nature-Inspired Biomimicry Summit Exploration for Aerospace NASA/Ohio Aerospace Institute Cleveland, OH USA (10/5/2017)
- *Invited Presentation: "United States of E-coli"* poster and multi-cultural directed evolution strategy presentation with Shannon L. Johnson for Label Free entry to [Evolthon Genome Engineering Challenge](#) at Genome Evolution Conference, Weizmann Institute of Science, Shannon L. Johnson, Timothy Stiles, Rachel Soo-Hoo Smith, **Andreas Mershin** Rehovot, ISRAEL(11/1-3/2016)
- *"BioManufacturing Impossible Materials"*DARPA MTO Workshop, Dana Point, CA, USA (02/25/2011)
- *"Bio-based RealNose"* DARPA RealNose Industry Day: Arlington, VA, USA (01/15/2008)
- Joint NSF/DARPA PI meeting, Ft. Lauderdale, FL, USA, *Electromagnetic and informational processes in biomolecular polymers* (05/15/2003)

Selected Mass Media:

Thousands of media impressions in national and international print, TV, radio, Internet: CNN, Fox, BBC, VoA, NYT, FT (updates at <https://www.mershin.org/>)

- [New Scientist](#), [The Telegraph -Cancer Detecting Dogs](#), [Forbes](#), [Xconomy](#), Popular Mechanics, [Town and Country](#), [Fast Company](#), [Gizmodo](#), [Eetimes](#), [ZDNet](#), CleanTechLA, Environment Report, [InventorSpot](#), [TechTalk](#), [MITNews](#), Nature Network Boston, [Physorg](#), [ETCounsel](#), [Technology Review](#), [Boston Globe](#), [Wired](#), [Engineering for Change: "The Biosolar Race is On"](#), [PhysOrg: BioPV alternative to traditional solar cells](#), [BBC Radio 4: Inside Health](#)
- TV Specials: "Visions of the Future" (with Michio Kaku) BBC4 (2007), "Quantum Mysteries" (2003)

Patents

- Lai, David (GSK) & Turlomousis, Filippos, Gershenfeld, Neil, **Mershin, Andreas** (MIT) "*Methods and Apparatus for Variable Emulsification*" -joint assignees GSK-MIT, US **Utility** Application Number 16052705 filed Aug 2 2018, Provisional Filed Dec. 14 2017
- **Mershin, Andreas** & Adamala, Katarzyna "*Methods and Apparatus for Synthetic Cell (Synell) Creation, Evolution, and Digital Transmission*" MIT Ref. No. 19194X Ser. No. 62/429,787 US **Utility** Application Number 15/831,379 Filed Dec. 5 2017
- **Mershin, Andreas** "*Methods and Apparatus for Temporal Stereoscopy*" US **Provisional** Application No. 62/581,508 Filed November 3, 2017
- **Mershin, Andreas**, "[Methods and apparatus for shifted-wavelength photosynthetic energy harvesting and biomass production](#)". United States Utility Patent EFS ID 28882766 **Utility** Application Number: 15483572 Filing Date: April 10 2017, Publication Date Oct 19 2017
- Johnson, Shannon & **Mershin, Andreas** "*Methods and Apparatus for Directed Exaptation*" **Disclosure** to MIT Case No. 19895X Aug 29 2017
- **Mershin, Andreas**, Karydis, Thrasyvoulos "[Methods, Systems, and Apparatus For Self-Calibrating EEG Neurofeedback](#)" United States Patent Application [20160235324](#) **Utility** Application Number: 15/043909 Publication Date: 08/18/2016, Filing Date: 02/15/2016
- **Mershin, Andreas**, Pelletier, James, Gershenfeld, Neil, Glass, John, Strychalski, Elizabeth. [Methods and Apparatus for Transplantation of Nucleic Acid Molecules](#) United States **Utility** Patent Application [20150037890](#) Application Number 14/449106 Publication Date: Feb 05 2015
- **Mershin, A.**, Noireaux V, Pelletier JF, Gershenfeld NA "[Methods and Apparatus for Cell-Free Microfluidic- Assisted Biosynthesis](#)". US **Utility** 14/735,132. 2015 June 09 2015
- **Mershin A.** Leffell A. "[Methods and Apparatus for Microfluidic Perfusion](#)". US 62164072. US9610578 B2 GrantUS 15/158,644 April 4, 2017 Filing date May 19, 2016 Priority date May 20 2015
- **Mershin A**, Cook B.L., Kaiser L, Bikker J.F., Miura Y. *inventors* "[Multiplexed olfactory receptor-based microsurface plasmon polariton detector](#)" US 8748111. June 10 2014
- **Mershin Andreas**, Wassie Asmamaw, Maguire Yael, Kong Dave, Zhang Shuguang, Moran Patrick, Corin Karolina *inventors*, "[Methods and Apparatus for Artificial Olfaction](#)". US 13/966,169. August 13 2013

- **Mershin A**, Zhang S, Prakash M, Kong D, Maguire Y., *inventors* [Bio-sensing nanodevice](#). US 20090156427. June 18 2009
- **Mershin A**, Cook BL, Zhang S. *inventors*, [Bio-sensitized solar cells \(BSSC\)](#). US 8796544. Publication date August 05 2014, Priority date Dec 14 2005

Ongoing research support:

- 2013-2019 PI: GlaxoSmithKline label-free biomolecular interaction assays, machine olfaction, drug discovery, synthetic biology 3D bioprinting (\$200-\$500K/year)
- 2013- co-PI: Bay Valley Innovation Center, Shanghai, China. synthetic biology fab labs, next generation microfluidic perfusion (~\$250K/year)

Pending research support:

- 2018-2019 co-PI: MGH-MIT Strategic Partnership Grand Challenge Round 2: Cost-effective Accurate Diagnostics. "Wearable, Self-Calibrated EEG Monitoring to Diagnose and Predict Suicidal Thoughts and Behaviors" submitted Jan 16 2018 (\$100K/year)
- 2018-2019 PI: Prostate Cancer Foundation US Pilot Grant: "Machine Olfaction Prostate Cancer Diagnostics" submitted June 2018 (\$100K/6 months)
- 2018-2019 PI: Standard Banking Group "BioFab/BioHab: bioterials and mycotecture for self-replicating structures", in preparation for submission Aug 2018 (\$485K/1y)
- 2018-2021 co-PI: Keck Foundation "Temperature Sensing in Inflammation and Regulation of Immunity" submitted July 2018 (\$1M/3 years)

Completed research support:

- 2013-2017 PI and Project Manager GSK-CBA sponsorship (\$~1.4M)
- 2012-2013 Key personnel and "Biological Parcel Service (BPS)" project manager of DARPA Living Foundries "Programmable Biomatter" project. (\$~1M)
- 2011-2012 PI and Project Manager: Label-Free Molecular Interaction Recognition Platform for Machine Olfaction Applications (~\$175K industry sponsored research - Quantum Recognition)
- 2008-2010 Project Manager and lead co-PI: DARPA "MITRealNose" (Microfluidic-Integrated Transduction RealNose): \$9.8M for three Phases (only Phase I completed before DARPA cancellation of entire program ~\$4M)
- 2007-2008 co-PI MIT-ROHM Multiplexed Biosensing (\$1M)
- 2001-2003 NSF grant in support of PhD research \$250K

2001-2003 Texas Informatics Task Force in matching support of PhD dissertation research \$236K

1999-2002 Received two direct research grants from the TAMU Dean of Science \$15K

Teaching

1997-2002 Teaching Assistant, Physics Department, Texas A&M University. Taught all undergraduate physics courses to engineers (201&218 Mechanics, 202&208 Electricity & Magnetism). Received consistently excellent student reviews. Conducted lectures, recitations, laboratories, reviews, tutorials.

2001-2003 Developed all content and deployed the first ever web-based teaching tools at Texas A&M University: "Automated Mathematics Evaluation System" (AMES) and "Computerized Homework Assignment Grading System" (CHAGS). Both became standard curriculum for engineering and physics students (~30,000users per year) (<http://faculty.physics.tamu.edu/toback/218/quiz/>)

2004-2010 *Molecular Structure of Biological Materials*
MIT 20.342/442 Guest lecturer for sessions on bio-nano-materials, bioelectronics

2005-2007 "*Learning to Fly in the Boston Area*"
MIT Flying Club bi-annual seminar for private pilot candidates

2012- MIT Sloan Executive Education
"*Lab-to-Market the MIT way*"

2012 MIT Course 8
Experimental Study Group ("Hard" Undergraduate Physics)

2014- MIT Industrial Liaison Program
"*Lab-to-Market Transitions within Industrial Innovation Cultures*"

2015- MIT IAP annual class and practical olfactory training:
"*Making Sense of Scent*"
-Jan 24 2018 1:45-5pm E14-633

2018 MIT IAP class & design challenge with architect Chris Maurer (RedHouse)
"*Creating Extreme Biomaterials, Designing a Sustainable Future for Architecture*
- Jan 25 2018 11am-4pm E15-359

Mentorship

Jing Han (MIT EE 2007 -researcher at Intel), Christopher J. Love (MIT Chem Eng 2009 -MITEI PhD 2014 Fellow), Asmamaw T. Wassie (MIT Chem/BE 2012, SynNeuroBio PhD 2018),

Michael Kotson (MIT BS Physics 2012, PhD candidate in Astrophysics U Hawaii), Alex Siegrist (MIT visiting 2006 -MS ETH 2007), Brian Cook (MIT BE PhD 2009, MIT CBE Postdoc 2010), Dirk Steurwald (MS visiting MIT -PhD 2013 Zurich), Andrish Reddy (MIT visiting PhD Biomedical Engineering U of Cape Town 2014), Karolina Corin (MIT PhD BE 2011, -MIT CBE & CBA PostDoc 2012), Marco Salazar (MIT freshman –UROP 2012), Thomas Duval (MS visiting scholar MIT 2013), Ali Farag (UROP 2013) Dionysis Christodouleas (PostDoc Harvard 2014-2017), Quiyi Han (MIT PostDoc 2017-2018), Rui Quing (MIT PostDoc 2016-2018) Mani Jammalamadaka (MIT MS 2017), Michael Skuhersky (2013-2-15 MIT CBA technician, 2015- MIT MAS PhD candidate) Nick Savides (MIT PostDoc 2015-2017), Alex Leffel (MIT MechEnd 2017), Thrasyvoulos Karydis (MAS MS 2017, PhD '20), [Shannon Johnson](#) (MIT CBA Technician, MAS MS '19), Filippos Turlomoussis, (PhD Stevens Institute of Technology 2017, MIT CBA PostDoc 2017-2019), Patricia Stathatou, (PhD Chem. Eng. National Technical University Athens 2017, PostDoc NTUA 2017-), Vladimir Leopard, (BA Geology U Mass Boston 2017, MIT AeroAstro Lab Manager, QAward NZ admin 2018-)

Languages

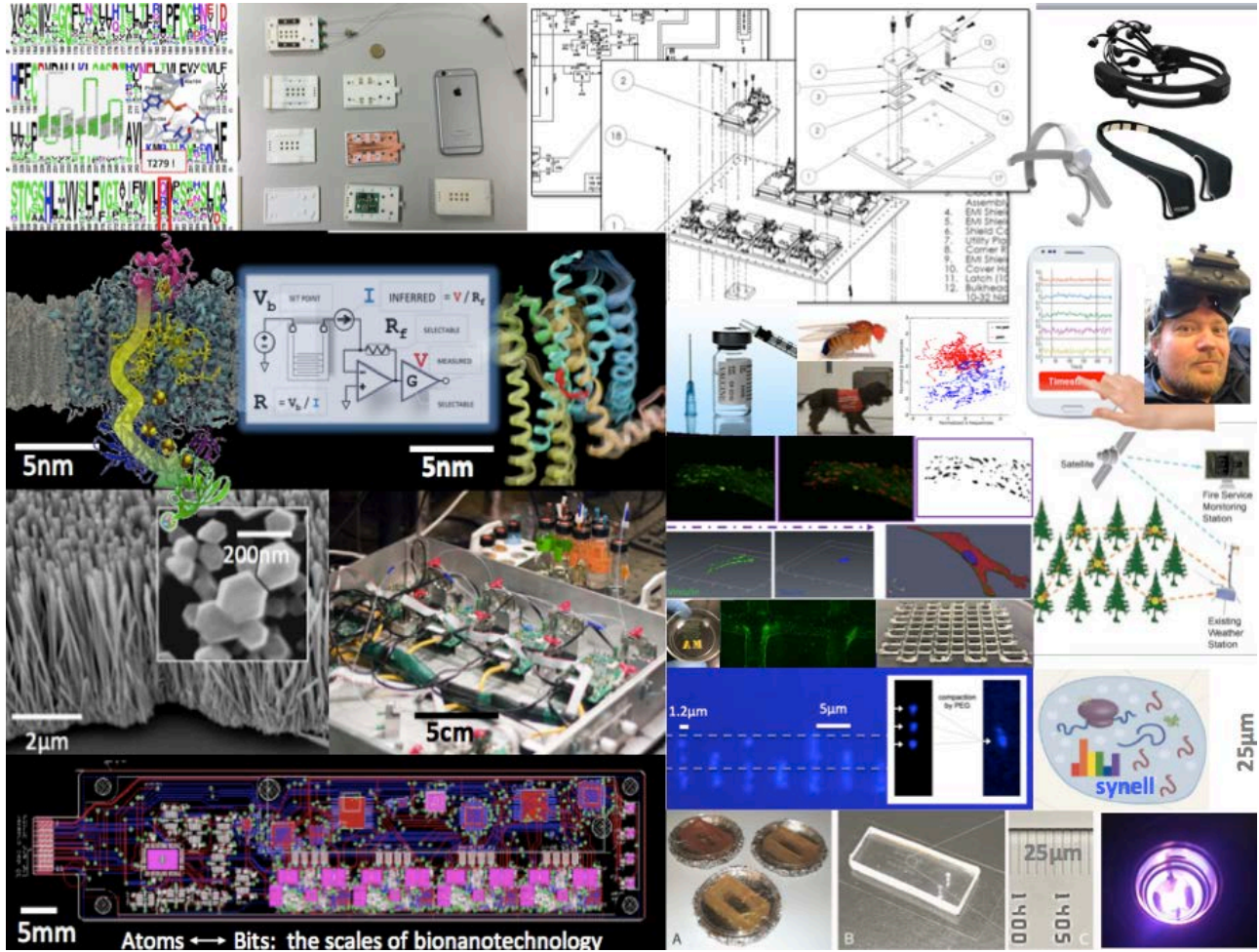
Fluent in English, Greek and Russian

C++, FORTRAN, BASIC, HTML, AVS, TINKER, MatLab, UNIX, MacOS, WinXX.

Other Interests

Airplane pilot, glider pilot, SCUBA Dive Master, VF750 '88 SuperMagna

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