

DAN HUH

Bioengineer + Designer

Professor
Department of Bioengineering
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Training + Experience

Seoul National University
B.S. in Mechanical Engineering
1994-2000

University of Michigan
Ph.D. in Biomedical Engineering
2004-2007
M.S. in Biomedical Engineering
M.S. in Mechanical Engineering
2000-2002
Advisor: Prof. Shuichi Takayama

*Harvard Medical School
Children's Hospital Boston*
Postdoctoral Fellow
2007-2009
Advisor: Prof. Donald Ingber

*Harvard University
Wyss Institute*
Wyss Technology Development Fellow
Research Associate
2009-2012
Advisor: Prof. Donald Ingber

University of Pennsylvania
Department of Bioengineering
Professor
2024-present

University of Pennsylvania
Department of Bioengineering
Associate Professor
2019-2024

University of Pennsylvania
Department of Bioengineering
Wilf Family Term Assistant
Professor
2013-2019

*Penn Center for Innovation &
Precision Dentistry (CiPD)*
Member
2021-present

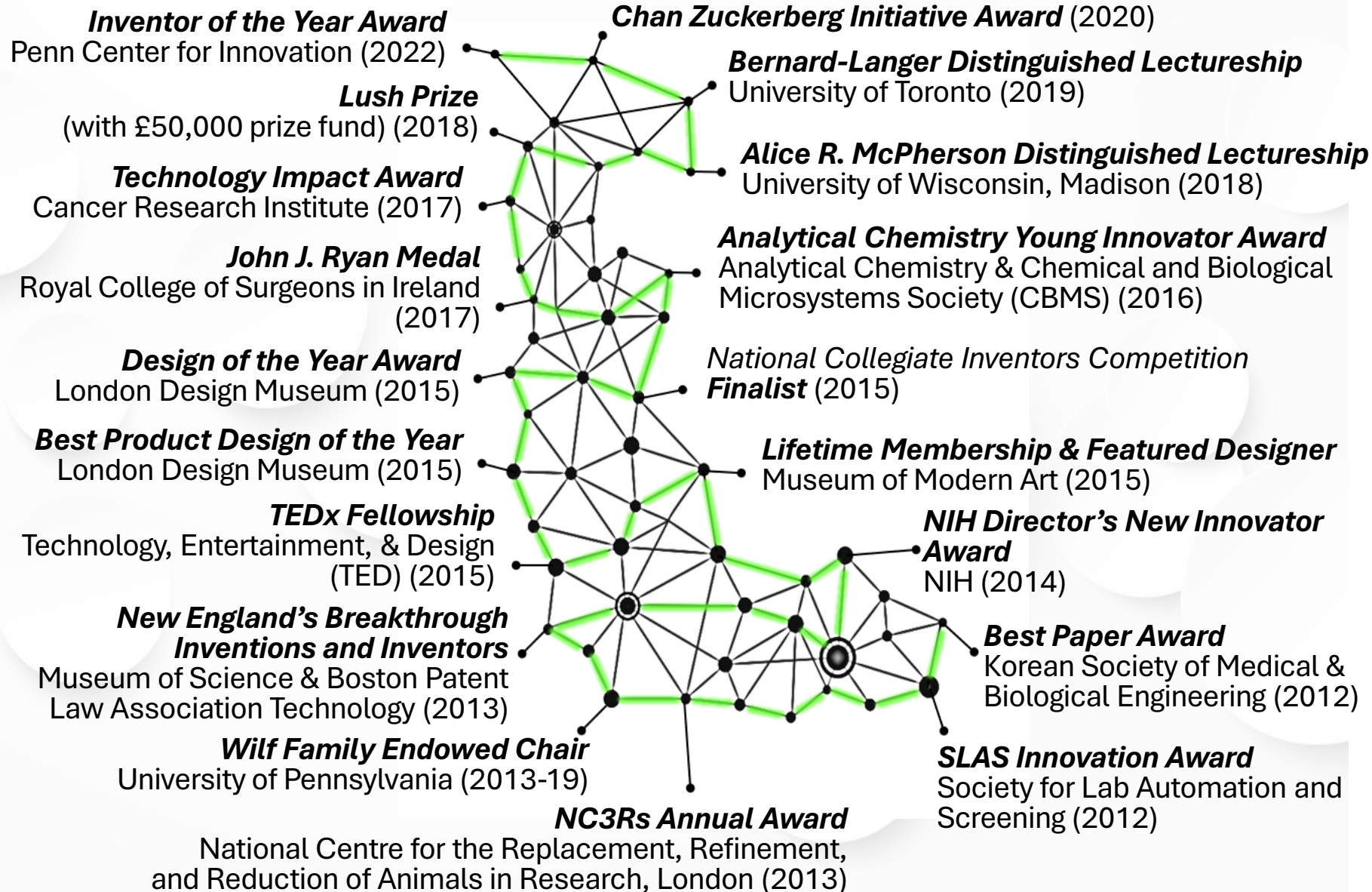
*Center for Engineering
Mechanobiology (CEMB)*
Member
2016-present

Museum of Modern Art (MOMA)
Registered Artist & Lifetime
Member 2015-present

*Penn Institute for Regenerative
Medicine (IRM)*
Member
2013-present

*Seoul National University
College of Medicine*
Department of Biomedical Engineering
Assistant Professor
2012-2013

Awards + Honors



PRIOR TO 2012

- INDEX: Design for Life Award Finalist** (2011)
- Top 100 Science Stories of 2010**, Discover Magazine (2011)
- Scientific Breakthrough of the Year Award**, American Thoracic Society (2011)
- Best Publication Award**, Nanotoxicology Specialty Section, Society of Toxicology (2011)
- Best Postdoctoral Award**, In Vitro and Alternative Methods Annual Competition, Society of Toxicology (2011)
- Wyss Technology Development Fellowship**, Harvard University (2009 – 2012)
- Best Poster Award**, Gordon Research Conference on Physics and Chemistry of Microfluidics (2007)
- Best Talk of the Year Award**, Microfluidics Interdisciplinary Seminar Series, University of Michigan (2007)
- Best Poster Award**, 2006 Engineering Symposium, University of Michigan (2006)
- Distinguished Achievement Award**, University of Michigan (2005)
- Best Poster Award**, 2005 NASA Bioscience and Engineering Institute Symposium (2005)
- Horace H. Rackham Predoctoral Fellowship**, University of Michigan (2005)
- Widmer Best Poster Award**, microTAS (2004)

Representative publications

H Liu, E Noguera-Ortega, M Liousia, Z Chen, WD Lee, X Dong, A Wang, JY Park, A Liu, MC Martinez, JJ Brotman, S Kim, GS Worthen, JD Rabinowitz, EJ Wherry, E Pure, EK Moon, SM Albelda, DD Huh, “**Microengineered transplantation of human solid tumors for in vitro studies of CAR T immunotherapy,**” to appear in *Nature Biotechnology* 2024.

J Paek, LR Teegala, F Alisafaei, GC Clair, JW Song, SE Park, CK Ansong, MJ Mondrinos, V Shenoy, C Thodeti, SM Paruchuri, DD Huh, “**A microengineered model of mechanical force-induced tissue remodeling in human lungs,**” to appear in *Nature Biomedical Engineering* 2024.

A Georgescu, JH Oved, J. Galarraga, T Cantrell, S Mehta, BM Dulmovits, TS Olsen, P Fattahi, A Wang, P Candarlioglu, A Muvaffak, MM Kim, J Seo, E Diffenderfer, A Lynch, GS Worthen*, DD Huh*, “**Self-assembled hematopoietic niche and emergent innate immunity on a chip,**” *Cell Stem Cell* 2024 accepted for publication.

SE Park, S Kang, J Paek, A Georgescu, J Chang, AY Yi, T Karakasheva, KE Hamilton, DD Huh, “**Geometric engineering of organoid culture for enhanced organogenesis in a dish,**” *Nature Methods* 2022, 19, 1449-1460, <https://doi.org/10.1038/s41592-022-01643-8>.

JY Park, S Mani, G. Clair, HM Olson, VL Paurus, CK Ansong, C Blundell, R Young, J Kanter, S Gordon, AY Yi, M Mainigi*, DD Huh*, “**A microphysiological model of human trophoblast invasion during early embryo implantation,**” *Nature Communications* 2022, 13, 1252, <https://doi.org/10.1038/s41467-022-28663-4>.

M Mondrinos, F Alisafaei, YS Yi, H Ahmadzaeh, I Lee, C Blundell, J Seo, M Osborn, T Chun, SM Kim, VB Shenoy, D Huh, “**Surface-directed engineering of tissue anisotropy in microphysiological models of musculoskeletal tissue,**” *Science Advances* 2021, 7, eabe9446, <https://doi.org/10.1126/sciadv.abe9446>.

J Seo, WY Byun, F Alisafaei, A Georgescu, M Massaro-Giordano, VB Shenoy, V Lee, V Bunya, D Huh, “**Multiscale reverse engineering of the human ocular surface,**” *Nature Medicine* 2019, 25, 1310-1318, <https://doi.org/10.1038/s41591-019-0531-2>.

SE Park, A Georgescu, D Huh, “**Organoids-on-a-chip,**” *Science* 2019, 364, 960-965, <https://doi.org/10.1126/science.aaw7894>

E Esch, A Bahinski, D Huh, “**Organs-on-chips at the frontiers of drug discovery,**” *Nature Reviews Drug Discovery* 2015, 14, 248-260, <https://doi.org/10.1038/nrd4539>

Representative publications

PRIOR TO 2012

D Huh, BD Matthews, A Mammoto, M Montoya, HY Hsin, DE Ingber, **“Reconstituting organ-level lung functions on a chip,”** *Science* 2010, 328, 1662-1668. [https://DOI: 10.1126/science.1188302](https://doi.org/10.1126/science.1188302)

D Huh, DC Leslie, BD Matthews, JP Fraser, S Jurek, GA Hamilton, KS Thorneloe, MA McAlexander, DE Ingber, **“A human disease model of drug toxicity-induced pulmonary edema in a lung-on-a-chip microdevice,”** *Science Translational Medicine* 2012, 4, 1-8. [http:// DOI: 10.1126/scitranslmed.3004249](http://DOI: 10.1126/scitranslmed.3004249)

D Huh, HJ Kim, JP Fraser, DE Shea, M Khan, A Bahinski, GA Hamilton, DE Ingber, **“Microfabrication of human organs-on-chips,”** *Nature Protocols* 2013, 8, 2135-2157. <https://doi.org/10.1038/nprot.2013.137>

A Mammoto, KM Connor, T Mammoto, CW Yung, D Huh, CM Aderman, G Mostoslavsky, LEH Smith, DE Ingber, **“A mechanosensitive transcriptional mechanism that controls angiogenesis,”** *Nature* 2009, 457, 1103-1111. <https://doi.org/10.1038/nature07765>

D. Huh, G.A. Hamilton, D.E. Ingber, **“From three-dimensional cell culture to organs-on-chips,”** *Trends Cell Biol.* 2011, 21, 745-754. <https://doi.org/10.1016/j.tcb.2011.09.005>

D Huh, KL Mills, X Zhu, MA Burns, MD Thouless, S Takayama, **“Tuneable Elastomeric Nanochannels for Nanofluidic Manipulation,”** *Nature Materials* 2007, 6, 424-428. <https://doi.org/10.1038/nmat1907>

D Huh, H Fujioka, YC Tung, N Futai, R Paine III, JB Grotberg, S Takayama, **“Acoustically Detectable Cellular-Level Lung Injury Induced by Fluid Mechanical Stresses in Microfluidic Airway Systems,”** *PNAS* 2007, 104, 18886-18891. <https://doi.org/10.1073/pnas.0610868104>

D. Huh, A.H. Tkaczyk, J.H. Bahng, Y Chang, H.-H. Wei, J.B. Grotberg, C.-J. Kim, K. Kurabayashi, S. Takayama, **“Reversible Switching of High-Speed Air-Liquid Two-Phase Flows Using Electrowetting-Assisted Flow-Pattern Change,”** *JACS* 2003, 125, 14678-14679. <https://doi.org/10.1021/ja037350g>

Full publication list

1. P Fattahi, M Younesi, WD Lee, K Whang, T Kang, JD Rabinowitz, LM Aleksunes, DD Huh, “**A bioengineered model of human placental exposure to heavy metals during pregnancy,**” *submitted*.
2. J Paek, LR Teegala, F Alisafaei, GC Clair, JW Song, SE Park, CK Ansong, MJ Mondrinos, V Shenoy, C Thodeti, SM Paruchuri, DD Huh, “**A microengineered model of mechanical force-induced tissue remodeling in human lungs,**” *submitted*.
3. S Kim, N Guo, ZY Tan, X Gao, P Fattahi, H Liu, J Chang, M Younesi, S Jung, Y Chung, M Song, M Jung, DD Huh, “**A bioengineered model of the human cornea for preclinical assessment of human ocular exposure to environmental toxicants,**” *submitted*.
4. SE Park, HI Edelstein R Truitt, W Yang, D Stambolian, DD Huh, “**A bioengineered microphysiological model of the human retina-blood interface,**” *submitted*.
5. H Liu, E Noguera-Ortega, M Liouisia, Z Chen, WD Lee, X Dong, A Wang, JY Park, A Liu, MC Martinez, JJ Brotman, S Kim, GS Worthen, JD Rabinowitz, EJ Wherry, E Pure, EK Moon, SM Albelda, DD Huh, “**Microengineered transplantation of human solid tumors for in vitro studies of CAR T immunotherapy,**” *submitted*.
6. A Lang, E Eastburn, M Younesi, M Nijsure, C Siciliano, AP Haran, C Panebianco, E Seidl, R Tang, E Alsberg, NJ Willett, R Gottardi, DD Huh, JD Boerckel, “**Cyr16 delivery promotes angiogenesis during bone fracture repair,**” *submitted*.
7. DD Huh, “**Microengineered avatars of human tissues in space,**” *submitted*.
8. MK Simoni, SG Negatu, JY Park, S Mani, MC Arreguin, K Amses, DD Huh, M Mainigi, KA Jurado, “**Type I interferon alters invasive extravillous trophoblast function,**” *submitted*.
9. A Georgescu, JH Oved, JH Galarraga, T Cantrell, S Mehta, BM Dulmovits, TS Olson, P Fattahi, A Wang, PL Candarlioglu, A Muvaffak, MM Kim, SA Aydin, J Seo, ES Diffenderfer, A Lynch, GS Worthen*, DD Huh*, “**Self-assembled hematopoietic niche and emergent innate immunity on a chip,**” *Cell Stem Cell* 2024 *accepted for publication*.
10. D Kozlosky, C Doherty, B Buckley, MJ Goedken, RK Miller, DD Huh, ES Barrett, LM Aleksunes, “**Fetoplacental disposition and cadmium toxicity in mice lacking the BCRP transporter,**” *Toxicological Sciences* 2024, 197, 132-146, <http://doi.org/10.1093/toxsci/kfad115>
11. S Mani, J Garifallou, SJ Kim, MK Simoni, DD Huh, SM Gordon, M Mainigi, “**Uterine macrophages and NK cells exhibit population and gene-level changes after implantation but maintain pro-invasive properties,**” *Frontiers in Immunology* 2024, 15:1364036. <https://doi.org/10.3389/fimmu.2024.1364036>



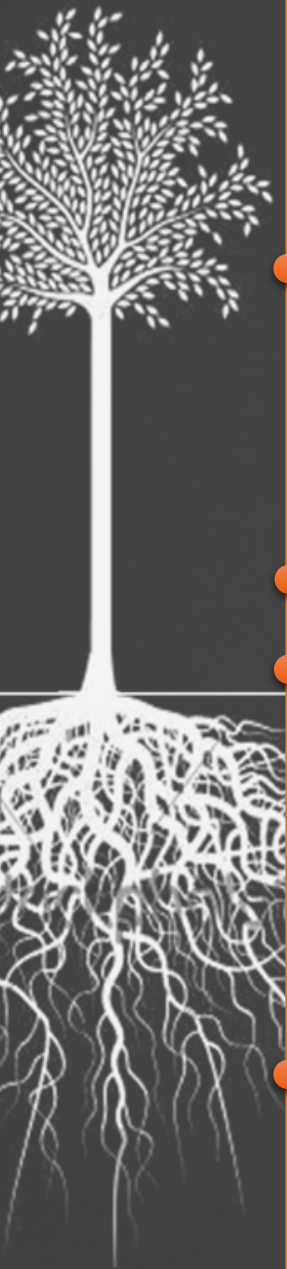
12. J Kanter, SM Gordon, S Mani, A Sokalska, JY Park, S Senapati, DD Huh, M Mainigi, “**Hormonal stimulation reduces numbers and impairs function of human uterine natural killer cells during implantation,**” *Human Reproduction* 2023, 38, 1047-1059 <https://doi.org/10.1093/humrep/dead069>.
13. P Fattahi, YT Yeh, T Zhao, M Younesi, C Huang, M Terrones, S Zheng, JL Brown, DD Huh, S Zhang, PJ Butler, “**Endothelial cell selectivity to nanoparticles depends on mechanical phenotype,**” *Advanced Materials Interfaces* 2023, 10, 2300137, <https://doi.org/10.1002/admi.202300137>
14. MAU Khalid, KH Kim, ARC Salih, K Hyun, SH Park, B Kang, AM Soomro, M Ali, H Cho, Y Jun, DD Huh, KH Choi, “**High Performance Inkjet Printed Embedded Biosensors for Monitoring Hypoxia in Gut Bilayer Microfluidic Chip,**” *Lab on a Chip* 2022, 22, 1764, <https://doi.org/10.1039/D1LC01079D>.
15. C Sakolish, A Georgescu, DD Huh, I Rusyn, “**A model of human airway on a chip for studies of sub-acute effects of inhalation toxicants,**” *Toxicological Sciences* 2022, 26, 267, <https://doi.org/10.1093/toxsci/kfac036>.
16. SE Park, S Kang, J Paek, A Georgescu, J Chang, AY Yi, T Karakasheva, KE Hamilton, DD Huh, “**Geometric engineering of organoid culture for enhanced organogenesis in a dish,**” *Nature Methods* 2022, 19, 1449-1460, <https://doi.org/10.1038/s41592-022-01643-8>.
17. JY Park, S Mani, G. Clair, HM Olson, VL Paurus, CK Ansong, C Blundell, R Young, J Kanter, S Gordon, AY Yi, M Mainigi*, DD Huh*, “**A microphysiological model of human trophoblast invasion during early embryo implantation,**” *Nature Communications* 2022, 13, 1252, <https://doi.org/10.1038/s41467-022-28663-4>.
18. MA Khalid, KH Kim, S Chethikkattuveli, R Abdul, K Hyun, SH Park, H Sung, B Kang, A Soomro, M Ali, Y Jun, DD Huh, H Cho, KH Choi, “**High performance inkjet printed embedded electrochemical sensors for monitoring hypoxia in gut bilayer microfluidic chip,**” *Lab on a Chip* 2022, <https://doi.org/10.1039/D1LC01079D>.
19. A Rahim C Salih, K Hyun, A Asif, AM Soomro, HMU Farooqi, Y Kim, KH Kim, J Lee, D Huh, KH Choi, “**Extracellular matrix optimization for enhanced physiological emulation on organ-on-a-chip,**” *Polymers* 2021, 13, 3016, <https://doi.org/10.3390/polym13173016>
20. S Kang, SE Park, D Huh, “**Organ-on-a-chip technology for nanoparticle research,**” *Nano Convergence* 2021, 8, 20, <https://doi.org/10.1186/s40580-021-00270-x>.
21. J Paek, JW Song, E Ban, VB Shenoy, D Huh, “**Soft-robotic constrictor for in vitro modeling of dynamic tissue compression,**” *Scientific Reports* 2021, 11, 16478. <https://doi.org/10.1038/s41598-021-94769-2>.
22. RY Young, D Huh, “**Organ-on-a-chip technology for the study of the human reproductive system,**” *Advanced Drug Delivery Reviews* 2021, doi: <https://doi.org/10.1016/j.addr.2021.03.010>



23. M Mondrinos, F Alisaifei, YS Yi, H Ahmadzaeh, I Lee, C Blundell, J Seo, M Osborn, T Chun, SM Kim, VB Shenoy, D Huh, **“Surface-directed engineering of tissue anisotropy in microphysiological models of musculoskeletal tissue,”** *Science Advances* 2021, 7, eabe9446, <https://doi.org/10.1126/sciadv.abe9446>.
24. Farooqi, H.M.U., Kang, B., Khalid, M.A.U., Salih, A.R.C., Hyun, K., Park, S.H., Huh, D. and Choi, K.H., **“Real-time monitoring of liver fibrosis through embedded sensors in a microphysiological system.”** *Nano Convergence* 2021, 8, 1.
25. SE Park, J Ahn, H-E Jeong, K-I Song, I Youn, D Huh*, S Chung*, **“In vitro model of three-dimensional peripheral myelination,”** *NPG Asia Materials* 2021, 13, 2. *co-corresponding authors
26. I Poventud-Fuentes, KW Kwon, J Seo, M Tomaiuolo, TJ Stalker, LF Brass, D Huh, **“A human vascular injury-on-a-chip model of hemostasis,”** *Small* 2021, doi.org/10.1002/sml.202004889.
27. Y Shim, Y Lim, T Kwak, JH Hwang, A Georgescu, D Huh*, D Kim*, T Kang*, **“Microfluidic Multi-scale Homogeneous Mixing with Uniform Residence Time Distribution for Rapid Production of Various Metal Core-shell Nanoparticles,”** *Advanced Functional Materials* 2021, doi.org/10.1002/adfm.202007856. *co-corresponding authors
28. M Ali, M Sajid, MAU Khalid, SW Kim, JH Lim, D Huh, KH Choi, **“A fluorescent lateral flow biosensor for the quantitative detection of Vaspin using upconverting nanoparticles,”** *Spectrochim. Acta A* 2020, 226, 117610.
29. YJ Chen, T Yamazoe, KF Leavens, FL Cardenas-Diaz, A Georgescu, D Huh, PJ Gadue, BZ Stanger, **“iPreP: a three-dimensional nanofibrillar cellulose hydrogel platform for long-term ex vivo preservation of human islets,”** *JCI Insight* 2019, 4, 124644.
30. J Seo, WY Byun, F Alisafaei, A Georgescu, M Massaro-Giordano, VB Shenoy, V Lee, V Bunya, D Huh, **“Multiscale reverse engineering of the human ocular surface,”** *Nature Medicine* 2019, 25, 1310-1318.
31. SE Park, A Georgescu, D Huh, **“Organoids-on-a-chip,”** *Science* 2019, 364, 960-965.
32. J Paek, SE Park, Q Lu, KT Park, M Cho, JM Oh, KW Kwon, YY Yi, JW Song, H.I. Edelstein, J. Ishibashi, W. Yang, JW Myerson, RY Kiseleva, P Aprelev, ED Hood, D Stambolian, P Seale, VR Muzykantov, D. Huh, **“Microphysiological engineering self-assembled and perfusable microvascular beds for the production of vascularized three-dimensional human microtissues,”** *ACS Nano* 2019, 13, 7627-7643.
33. S.E. Park, A. Georgescu, J.M. Oh, K.W. Kwon, D. Huh, **“Polydopamine-based interfacial engineering of three-dimensional cell culture for production and long-term maintenance of in vitro tissue constructs,”** *ACS Appl. Mater. Interfaces* 2019, 11, 23919-23925.
34. J. Chang, J. Lee, A. Georgescu, D. Huh, T. Kang, **“Generalized on-demand production of nanoparticle monolayers on arbitrary solid surfaces via capillarity-mediated inverse transfer,”** *Nano Letters* 2019, 19, 2074-2083.



35. D. Huh, “**Bioengineering and Metabolism Voices,**” *Cell Metabolism* 2019, 29, 506-512.
36. P. Elkington, M. Lerm, N. Kapoor, R. Mahon, E. Pienaar, D. Huh, D. Kaushal, D. Kaushal, L. Schlesinger, “**In vitro granuloma models of tuberculosis: potential and challenges,**” *J. Infect. Dis.* 2019, 24, 1858-1866.
37. J. Seo, D. Huh, “**Microphysiological models of human organs: a case study on microengineered lung-on-a-chip systems,**” *Microfluidic Cell Culture Systems*, Ed. Borenstein, J. 2019.
38. D. Huh, “**Microphysiological models of the respiratory system,**” *Biofabrication and 3D Tissue Modeling, Biomaterials Science Series*. Ed. Cho, D.-W. 2019.
39. K. Gkatzis, S. Taghizadeh, D. Huh, D.Y.R. Stainier, S. Bellusci, “**Using 3D organoids and lung-on-a-chip methods to study lung development, regeneration, and disease,**” *Eur. Respir. J.* 2018, 52, doi: 10.1183/13993003.00876-2018.
40. J. Song, J. Paek, K.T. Park, J. Seo, D. Huh, “**A bioinspired microfluidic model of mucus plug-induced airway injury,**” *Biomicrofluidics* 2018, 12, 042211.
41. C. Blundell, Y.S. Yi, L. Ma, E. Tess, M. Farrell, A. Georgescu, L. Aleksunes, D. Huh, “**Placental drug transport-on-a-chip: a microengineered in vitro model of transporter-mediated drug efflux in the human placental barrier,**” *Adv. Healthc. Mater.* 2017, doi: 10.1002/adhm.201700786 (cover article).
42. A.J. Clippinger, D. Allen, A.M. Jarabek, M. Corvaro, M. Gaça, S. Gehen, J.A. Hotchkiss, G. Patlewicz, J. Melbourne, P. Hinderliter, M. Yoon, D. Huh, A. Lowit, B. Buckley, M. Bartels, K. Bérubé, D.M. Wilson, I. Indans, M. Vinken, “**Alternative approaches for acute inhalation toxicity testing to address global regulatory and non-regulatory data requirements: An international workshop report,**” *Toxicol. In Vitro* 2018, 48, 53-70.
43. M. Mondrinos, Y.S. Yi, N.K. Wu, X. Ding, D. Huh, “**Natural extracellular matrix-derived semipermeable, optically transparent semipermeable membrane inserts for microfluidic cell culture,**” *Lab Chip* 2017, 17, 3146-3158.
44. J. Seo, D. Conegliano, M. Farrell, M. Cho, X. Ding, T. Seykora, D.Y. Qing, N.S. Mangalmurti, D. Huh, “**A microfluidic model of red blood cell transfusion-induced pulmonary vascular injury,**” *Sci. Rep.* 2017, DOI: 10.1038/S41598-017-03597-w.
45. S.H. Yang, J.W. Choi, D. Huh, H.A. Jo, S. Kim, C.S. Lim, J.C. Lee, H.C. Kim, H.M. Kwon, C. Kwak, K.W. Joo, Y.S. Kim, D.K. Kim, “**Roles of fluid shear stress and retinoic acid on the differentiation of primary cultured human podocytes.**” *Exp. Cell Res.* 2017, 354, 48-56.
46. S. Han, Y. Shin, H.E. Jeong, J. Jeon, R. Kamm, D. Huh, L. Sohn, and S. Chung, “**Constructive remodeling of a synthetic endothelial extracellular matrix,**” *Sci. Rep.* 2016, DOI:10.1038/srep18290.
47. C. Blundell, E. Tess, A. Schanzer, C. Coutifaris, E. Su, S. Parry, D. Huh, “**A microengineered model of the human placental barrier,**” *Lab Chip* 2016, DOI: 10.1039/C6LC00259E.



48. Y.S. Choi, E. Hyun, J. Seo, C. Blundell, H.C. Kim, E. Lee, S. Lee, W.K. Moon, D. Huh, “**A microengineered model of early-stage breast cancer,**” *Lab Chip* 2015, 15, 3350-3357.
49. J.S. Lee, Y.M. Han, H.C. Kim, C.J. Kim, R. Romero, J.S. Hong, D. Huh, “**Placenta-on-a-chip: a novel platform to study the biology of human placenta,**” *J. Matern. Fetal Neonatal Med.* 2015, 17, 1-9.
50. D. Huh, “**A human breathing lung-on-a-chip,**” *Ann. Am. Thorac. Soc.* 2015, 12, S42-S44.
51. E. Esch, A. Bahinski, D. Huh, “**Organs-on-chips at the frontiers of drug discovery,**” *Nat. Rev. Drug Discov.* 2015, 14, 248-260.
52. D.Y. Qing, D. Conegliano, J. Seo, J.P. Reilly, M.G. Shashaty, G.S. Worthen, D. Huh, N.J. Meyer, N.S. Mangalmurti, “**RBC transfusion increases susceptibility to lung inflammation through high mobility group box 1 released by necroptosis of lung endothelial cells,**” *Am. J. Respir. Crit. Care Med.* 2014, 190, 1243-1254.
53. S. Choi, Y. Hong, I. Lee, D. Huh, T.-J. Jeon, S.M. Kim, “**Effects of various extracellular matrix proteins on the growth of HL-1 cardiomyocytes,**” *Cells Tissues Organs* 2014, 198, 349-356.
54. D. Huh H.J. Kim, J.P. Fraser, D.E. Shea, M. Khan, A. Bahinski, G.A. Hamilton, D.E. Ingber, “**Microfabrication of human organs-on-chips,**” *Nat. Protoc.* 2013, 8, 2135-2157.
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56. J. Park, K.B. Kim, J. Lee, H.C. Kim, D. Huh*, “**Organomimetic Microsystems Technologies,**” *Biomed. Eng. Lett.* 2012, 2, 88-94.
57. D. Huh, Y. Torisawa, G.A. Hamilton, H.J. Kim, D.E. Ingber, “**Microengineered physiological biomimicry: organs-on-chips,**” *Lab Chip* 2012, 12, 2156-2164.
58. H.J. Kim, D. Huh, G.A. Hamilton, D.E. Ingber, “**Human gut-on-a-chip inhabited by microbial flora that experiences intestinal peristalsis-like motions and flow,**” *Lab Chip* 2012, 12, 2165-2174.
59. D. Huh, G.A. Hamilton, D.E. Ingber, “**From three-dimensional cell culture to organs-on-chips,**” *Trends Cell Biol.* 2011, 21, 745-754.
60. T. Mammoto, A. Mammoto, T. Tat, Y. Torisawa, A. Gibbs, R. Derda, R. Mannix, M. de Bruijin, C.W. Yung, D. Huh, D.E. Ingber, “**Mechanochemical control of mesenchymal condensation and embryonic tooth organ formation,**” *Dev. Cell* 2011, 21, 758-769.
61. D. Huh, B. D. Matthews, A. Mammoto, M. Montoya, H.Y. Hsin, D.E. Ingber, “**Reconstituting organ-level lung functions on a chip,**” *Science* 2010, 328, 1662-1668.



62. K. L. Mills, D. Huh, S. Takayama, M. D. Thouless, “**Instantaneous fabrication of arrays of normally closed, adjustable, and reversible nanochannels by tunnel cracking,**” *Lab Chip* 2010, 10, 1627-1630.
63. H. Tavana, C.-H. Kuo, Q.Y. Lee, B. Mosadegh, D. Huh, P.J. Christensen, J.B. Grotberg, S. Takayama, “**Dynamics of Liquid Plugs of Buffer and Surfactant Solutions in a Micro-Engineered Pulmonary Airway Model,**” *Langmuir* 2010, 26, 3744-3752.
64. A. Mammoto, K.M. Connor, T. Mammoto, C.W. Yung, D. Huh, C.M. Aderman, G. Mostoslavsky, L.E.H. Smith, D.E. Ingber, “**A Mechanosensitive Transcriptional Mechanism that Controls Angiogenesis,**” *Nature* 2009, 457, 1103-1111.
65. D. Huh, C.H. Kuo, J.B. Grotberg, S. Takayama, “**Gas-Liquid Two-Phase Flow Patterns in Rectangular Polymeric Microchannels,**” *New J. Phys.* 2009, 15, Art. No. 075034 .
66. Y. Zheng, H. Fujioka, S. Bian, Y. Torisawa, D. Huh, S. Takayama, J.B. Grotberg, “**Liquid Plug Propagation in Flexible Microchannels – A Small Airway Model.**” *Phys. Fluids* 2009, 21, Art. No. 071903.
67. H. Tavana, D. Huh, J.B. Grotberg, S. Takayama, “**Microfluidics, Lung Surfactant, and Respiratory Disorders,**” *Labmedicine* 2009, 40, 203-209.
68. H. Tavana, D. Huh, J.B. Grotberg, S. Takayama, “**Pulmonary Airways on a Chip: A New Approach to Study Respiratory Disorders,**” *BioForum Europe* 2009, 7-8, 14-16.
69. Y. Kamotani, T. Bersano-Begey, N. Kato, Y.-C. Tung, D. Huh, J.W. Song, S. Takayama, “**Individually Programmable Cell Stretching Microwell Arrays Actuated by a Braille Display,**” *Biomaterials* 2008, 29, 2646-2655.
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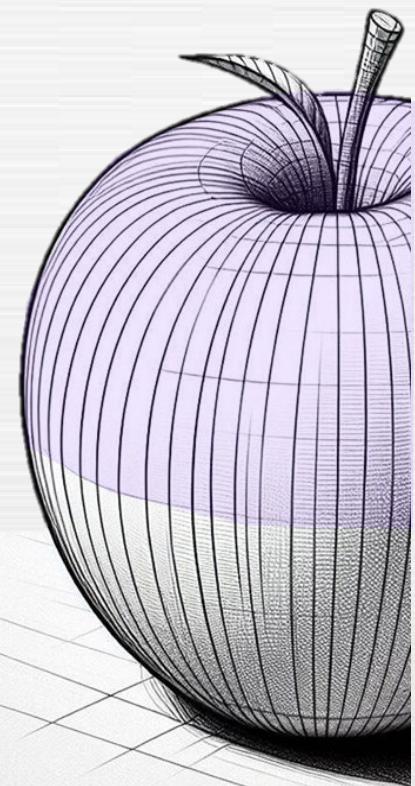
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Patents



N/A (Huh)
09/01/2020 – 08/31/25

Biomedical Advanced Research and Development Authority (BARDA): \$1,000,000 direct/year
Inhalation toxicology of chlorine gas-on-a-chip

This project will harness the power of lung-on-a-chip technology to create bioengineered in vitro platforms that can i) reproduce the living tissues of the human respiratory tract and their native microenvironment, ii) simulate realistic and physiologically relevant exposure conditions during chlorine inhalation, and iii) visualize and measure an array of biological responses to chlorine gas for quantitative imaging and multi-omics analysis towards the development of injury biomarkers and effective countermeasures.

1UG3DK122644-01 (Stanger, Huh, Gadu, Riley)
07/01/2019-06/30/2024

NIH/NIDDK: \$749,261 direct/year
Microphysiological systems for modeling autoimmunity in type I diabetes

This project aims to create robust systems containing human islet cells, immune cells, and other features to recapitulate the process of islet autoimmunity in type I diabetes.

1UC2HD113039-01 (Aleksunes, Huh, Zhu)
07/01/2023-06/30/2028

NIH/NIEHS: \$749,800 direct/year
Integrated Transporter Elucidation Center

The Integrated Transporter Elucidation Center aims to deorphanize, profile, and evaluate the role of membrane transporters in the placental disposition of drugs, nutrients, and toxicants.

1R01EY036519-01 (Rohrer, Huh, Atkinson, Stambolian)
07/01/2024-06/30/2029

NIH/NEI: \$794,658 direct/year
Assessment of the Complement Pathway in RPE/Choroid Tissue Chip

The proposed work aims to create a microengineered model of age-related macular degeneration (AMD) to investigate the effect of genetic risk factors and AMD-relevant stressors on disease progression and exacerbation.

N/A (Huh, Koo)
03/01/2023-02/28/2025

Colgate Palmolive Company: \$300,000 direct/year
Study of L-Arginine impact on interkingdom biofilm development and tissue infection using mouth-on-a-chip technology

This work aims to use a microengineered model of the oral cavity containing human gingival tissues and analogs of tooth organ to investigate the efficacy and mechanisms of action of arginine combinations on biofilm development and oral infection.

N/A (Huh)

05/01/2022-04/30/2027

Ministry of Trade, Industry & Energy of the Republic of Korea: \$98,000 direct/year

Development of 3D lung microphysiological platform for acute respiratory diseases

This study aims to develop a microengineered platform to mimic human lung tissues and screen respiratory toxicity of environmental materials.

1R01CA288366-01 (Chen): 06/2024 - 05/2029

NIH/NCI: \$1,858,595 total

Stromal Effects in Head and Neck Squamous Cell Carcinoma

The findings of this proposal will reveal a stromal progenitor cell hierarchy in squamous cell carcinoma to provide a foundation for cancer organoid culture, high-throughput screening, personalized medicine, and biomarker identification in head and neck cancer. The long-term goal of this proposal is to develop an applicable model to achieve the cure of cancer.

N/A (Mainigi): 06/01/2022-03/31/2026

Burroughs Wellcome Funds: \$500,000 direct/year

The role of estrogen metabolites in abnormal placentation

This project aims to investigate whether and how estrogen metabolites contribute to increased risk of preeclampsia following programmed frozen-thawed embryo-transfer.

N/A (Shenoy): 10/01/2016-09/30/2026

National Science Foundation

The Center for Engineering Mechanobiology

The Center for Engineering MechanoBiology (CEMB) is a multi-institutional Science and Technology Center funded by the NSF to advance the study of mechanical forces in molecules, cells, and tissues in plants and animals.

2P50HD068157-11D1 (Bartolomei): 07/2024 - 06/2028

NIH/NICHD: \$6,967,473 total

Penn Center for Study of Epigenetics in Reproduction

Project 1: We hypothesize that ART pregnancies with the greatest epigenetic disruption will be more likely to have adverse perinatal outcomes and be more likely to exhibit cardiometabolic changes during childhood, and that these disruptions will vary based on specific ART interventions. Project 3: In this project, we propose using two innovative in vitro models capable of quantifying changes in trophoblast function and epigenetic and transcriptomic perturbations, to carry out a thorough examination of the sex-specific impact of ART interventions on early pregnancy.

N/A (Pure): 09/2024 - 08/2029

NIH/NCI: \$3,240,830 total

***Stroma-dependent regulation of tumor
microenvironment***

The aim of this proposal is to investigate the impact of stromal cells on tumor vascularization and FAP-CART anti-tumor activity.

Research funding *active*

Research funding **completed**

1R01ES029275-01 (Aleksunes, Huh, Barrett)
09/01/2018-08/31/2023

NIH/NIEHS: \$400,000 direct/year

Placental responses to environmental chemicals

This project aims to use a highly translational approach to characterize barrier mechanisms, such as transporters, that can protect the placenta from cadmium toxicity and identify babies at the greatest risk of low birth weight following cadmium exposure.

Chan-Zuckerberg Initiative Award
09/01/2020-08/31/2022

Chan-Zuckerberg Initiative: \$225,000 direct/year

Impact of maternal inflammation on pregnancy

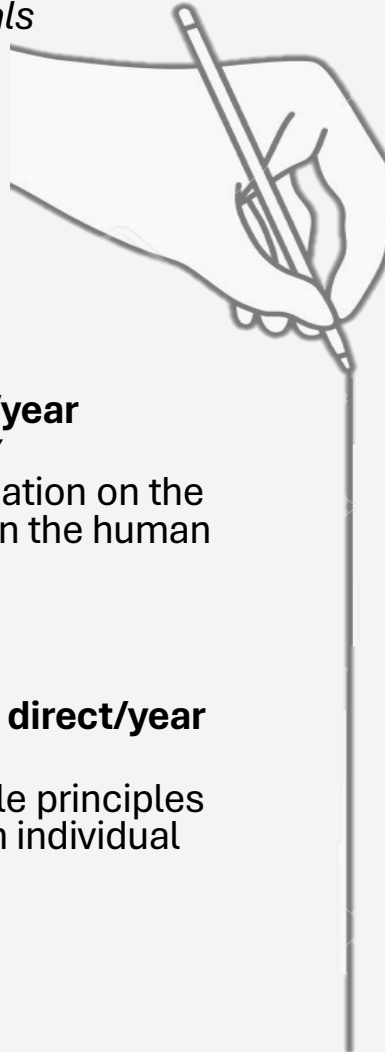
This project aims to study the effect of inflammation on the development of adverse pregnancy outcomes in the human placenta at the early stage of pregnancy.

N/A (Meaney, Smith)
09/01/2017-12/31/2022

Paul G. Allen Family Foundation: \$1,850,000 direct/year

Reconstructing Concussion

The goal of this project is to build the multi-scale principles of impairment and recovery of concussion from individual circuit to the whole brain.



N/A (Huh)
10/01/2021-12/31/2022

Alcon: \$173,909 direct/year

Testing ocular films in a human blinking eye-on-a-chip

This project aims to use a human blinking eye-on-a-chip to test engineered thin ocular films designed for the management of dry eye.

N/A (Huh)
02/26/2021-02/25/2023

Roche: Amount: \$154,743 direct/year

Human blinking eye-on-a-chip for screening dry eye drugs

This project aims to use a human blinking eye-on-a-chip to test new dry eye therapies developed by Roche.

1R21EY031465-01 (Harty)
06/01/2020-05/31/2022

NIH/NEI: \$234,000 direct/year

Predicted role of Ebola VP40-host interactions in ocular pathology and persistence

The aim of this study is to determine whether the interplay between VP40 and tight junction proteins modulates permeability of retinal and corneal barrier layers, and whether our novel antiviral therapeutics can block VP40 mediated egress and spread using an eye-on-a-chip organ system.

N/A (Huh)
02/01/2019-05/31/2022

Ministry of Trade, Industry & Energy of the Republic of Korea: \$55,000 direct/year

Development of microphysiological systems for animal-free cosmetics testing

This study aims to develop a vascularized human skin model for high-content and animal-free screening of cosmetics.

Research funding **completed**

N/A (Huh)

05/01/2021-06/30/2022

GSK: \$172,754 direct/year

Probing drug-induced corneal pathology in a human blinking eye-on-a-chip

This project aims to use a human blinking eye-on-a-chip to reproduce and investigate pathophysiological alterations of the human cornea due to anticancer drugs developed by GSK.

1UG3TR002198-01 (Huh, Worthen)

09/01/2017 - 08/31/2022

NIH/NCATS/CASIS: \$500,000 direct/year

Lung host defense in microgravity

The goals of this project are to test the feasibility of engineering individual microphysiological systems to model the airway and bone marrow that can be delivered to orbit (UG3) and to combine the models to emulate and understand the integrated immune responses of the human respiratory system in microgravity (UH3).

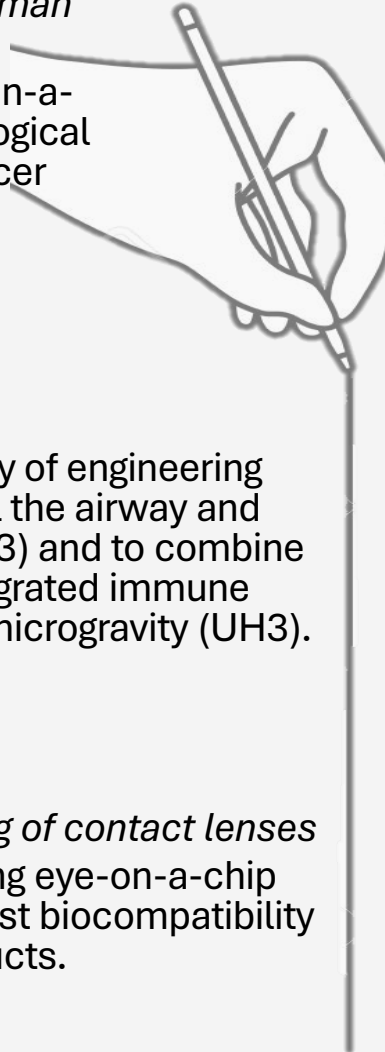
N/A (Huh, Bunya)

01/01/2020-8/31/2021

PCI: \$50,000 direct/year

Human blinking eye-on-a-chip for in vitro testing of contact lenses

This project focuses on utilizing a human blinking eye-on-a-chip system to develop a novel in vitro platform to test biocompatibility of contact lenses and related ophthalmic products.



CRI Technology Impact Award (Huh)

09/01/2017-08/31/2021

Cancer Research Institute: \$335,000 direct/year

A microengineered biomimetic model of tumor-immune cell interactions

This project aims to create a microengineered “cancer-on-a-chip” model using patient-derived cells to reconstitute vascularized adenocarcinoma in the human lung and to investigate physiologically relevant interaction of malignant tumor tissue with innate and adaptive immune cells for the study of cancer immunotherapy.

N/A (Harty, Huh)

02/01/2020-01/31/2021

Penn Institute for Translational Medicine and Therapeutic: \$15,000 direct/year

Ebola Virus VP40-Induced Ocular Pathology and Treatment

The goal of this project is to generate reagents and optimize assays for protein expression in ocular cells.

1DP2HL127720 (Huh)

09/01/2014-08/31/2019

NIH Director’s New Innovator Award: \$300,000 direct/year

Probing the physics of chronic lung disease using microphysiological biomimicry

The aim of this project is to develop a microphysiological model of chronic asthma in human lungs to study how pathological mechanical forces affect inflammation and tissue remodeling of small airways during the progression of asthma.

Research funding **completed**

R01 HL126788 (Mangalmurti)

09/01/2015-08/31/2020

NIH/NHLBI: \$284,000 direct/year

Role of RAGE and necroptosis in Transfusion Mediated Lung Inflammation

The major goal of this project is to understand the role of RAGE and necroptosis in lung Inflammation mediated by RBC transfusion.

N/A (Huh)

10/01/2017-2/28/2021

Penn Parker Institute for Cancer Immunotherapy: \$85,000 direct/year

Microengineered platforms for culturing explants of immune organs

The aim of this project is to develop microengineered cell culture platforms for modeling the complexity of the tumor microenvironment for applications in cancer immunotherapy research.

1UC4DK104196-01 (Stanger, Gadu, Zaret, Huh)

09/20/2014-06/30/2019

NIH/NIDDK: \$928,000 direct/year

A vascularized 3D biomimetic for islet function and physiology

This project aims to create a biomimetic microsystem that will facilitate long-term culture and manipulation of human islets in vitro and to optimize human islet function with respect to glucose sensing, insulin release, and stable maintenance of islet phenotypes.

U24DK076169 (Huh, Seale)

01/01/2016-12/31/2017

NIH/NIDDK (Role: PI): \$236,000 direct/year

Development and functional analysis of a human adipose tissue chip

This project aims to establish a stem cell-based three-dimensional (3D) microphysiological model that reconstitutes key microarchitecture, cellular heterogeneity, and physiological function of human subcutaneous white adipose tissue.

N/A (Worthen, Huh)

06/30/2017-06/30/2018

Penn Institute for Immunology: \$75,000 direct/year

Influenza infection in an autologous human airway-on-a-chip

This project aims to develop a microengineered autologous model of the human airway device to test influenza.

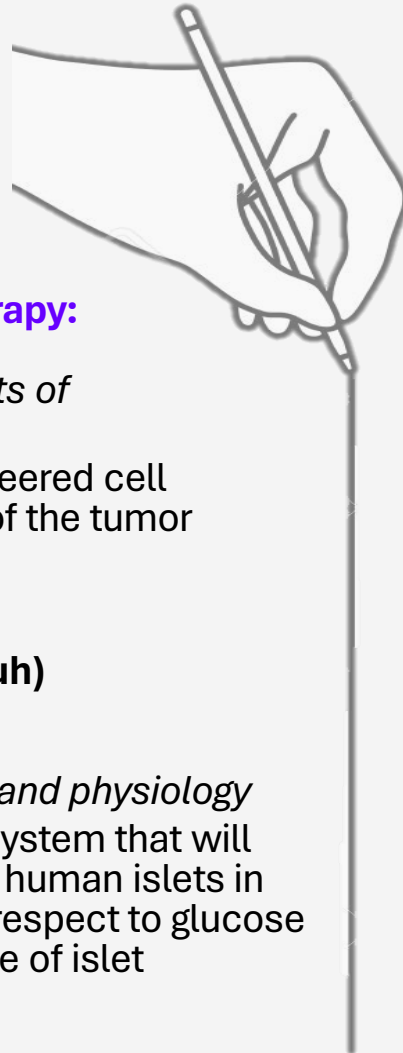
N/A (Huh)

09/01/2016-8/31/31/2016

Alternatives Research & Development Foundation (ARDF): \$40,000 direct/year

A microengineered “cervix-on-a-chip” as an alternative to animal models for the study of premature cervical remodeling in preterm birth

This study aims to develop a microengineered model of ascending infection-induced premature cervical remodeling.



Research funding **completed**

N/A (Huh, Cotsarelis)
01/01/2015-12/31/2016

**The Penn Institute for Regenerative
Medicine: \$100,000 direct/year**

*Bioengineering human hair follicles in vitro
using skin stem cells*

The aim of this project is to develop a microfabricated biomimetic cell culture platform to recapitulate native microarchitecture of human hair follicles for hair tissue engineering.

W911NF-12-2-0036 (Ingber)
07/01/2016 -06/30/2017

DARPA: \$53,000 direct/year

*Integrated human organ-on-chip microphysiological
systems*

The goal of this project is to create and optimize a microengineered reproductive organ model that can be functionally integrated into the multi-organ platform being developed by the Wyss Institute in the DARPA multiphysiological systems program.



2012M3A7B4035286 (Huh)
06/30/2013-06/29/2017

National Research Foundation of Korea: \$18,000 direct/year
*Development of Biomimetic lung disease models for testing and
optimization of composite nanostructure-based sensor systems*

The overarching goal of this study is to design and fabricate a microfluidic lung cancer model integrated with ultrasensitive in-line nanosensors based on biochemically functionalized carbon nanotube networks.

N/A (Mangalmurti)
09/30/2015-09/29/2018

Department of the Army: \$370,000 direct/year

Role of HMGB1 in Transfusion-Mediated Lung Inflammation

The primary goal of this project is to identify and characterize HMGB1 and its binding partners in the plasma of patients with early sepsis.

N/A (Driscoll)
11/01/2014 -10/31/2019

March of Dimes

*The March of Dimes Prematurity Research Center at the University
of Pennsylvania*

The overall goal of this project is to create a microengineered model of the placental barrier to investigate the effect of abnormal cellular metabolism on placental dysfunction leading to spontaneous preterm birth.

1. **Keynote: Microengineered biomimicry of human physiological systems**, 2024 II 3Rs Day – Models in Biomedical Research, i3S Institute, Porto, Portugal, October 2024
2. **Keynote: Microengineered biomimicry of human physiological systems**, 2024 MicroTAS, Montreal, Canada, October 2024
3. **Microengineered biomimicry of human physiological systems**, Cell Symposium – Engineering Development and Disease in Organoids, San Diego, USA, August 2024
4. **Keynote: Microengineered biomimicry of human physiological systems**, 2024 European Organ-on-Chip Society (EUROoCS) Meeting, Milan, Italy, July 2024
5. **Keynote: Microengineered biomimicry of human physiological systems**, 2024 Genetic Toxicology Association (GTA) Annual Meeting, Newark, USA, April 2024
6. **Microengineered biomimicry of human physiological systems**, Human Islet Research Network Meeting, Virtual, February 2024
7. **Keynote: Microengineered biomimicry of human physiological systems**, 2024 KASBP-SF Annual Symposium, San Francisco, USA, January 2024
8. **Keynote: Microengineered platforms for organoid research**, Biofusion Seminar 2023 – Organoids and Organ-on-Chip, Seoul, December 2023
9. **Microengineered biomimicry of human physiological systems**, 2023 AiChE Annual Meeting, Orlando, USA, November 2023
10. **Microengineered biomimicry of human physiological systems for space research**, Korea Advanced Institute of Science and Technology (KAIST), Korea, October 2023
11. **Keynote: Microengineered biomimicry of human physiological systems**, 2023 BMES Annual Meeting, Seattle, USA, October 2023



Invited lectures

12. **Keynote: Microengineered biomimicry of human physiological systems**, Annual Meeting for the Korean Society for Biotechnology and Bioengineering, Busan, Korea, October 2023
13. **Keynote: Microengineered biomimicry of human physiological systems**, 2023 Korea Advanced Alternative Test Conference, Oh-song, Korea, September 2023
14. **Microengineered biomimicry of human physiological systems**, The Catholic University of Korea, August 2023
15. **Microengineered biomimicry of human physiological systems**, Department of Mechanical Engineering, Sogang University, August 2023
16. **Keynote: Microengineered biomimicry of human physiological systems**, 13th Annual Hands-On Workshop in 3D-Printing & Microfluidics for Bioengineering Applications, McGill University, Montreal, Canada, May 2023
17. **Microengineered biomimicry of human physiological systems**, Center for Translational Stem Cell Biology, Hong Kong University of Science and Technology, May 2023
18. **Microengineered biomimicry of human physiological systems**, Department of Biomedical Engineering, Johns Hopkins University, MD, USA, April 2023
19. **Microengineered biomimicry of human physiological systems**, IRM Faculty Lunch, University of Pennsylvania, PA, USA, April 2023
20. **Microengineered biomimicry of human physiological systems**, Department of Biophysics, Sungkyunkwan University, Seoul, Korea, January 2023
21. **Plenary: Microengineered biomimicry of human physiological systems**, Biofusion Seminar 2022 – Organoids and Organ-on-Chip, Seoul, December 2022
22. **Microengineered biomimicry of human physiological systems**, Department of Chemical and Biomolecular Engineering, Sogang University, November 2022
23. **Microengineered biomimicry of human physiological systems**, Tissue Talk, October 2022
24. **Microengineered biomimicry of human physiological systems**, Roche, October 2022
25. **Microengineered biomimicry of human physiological systems**, Department of Microbiology, Choongbuk National University, August 2022
26. **Microengineered biomimicry of human physiological systems**, Department of Chemical Engineering, Jeonbuk National University, August 2022
27. **Plenary: Microengineered biomimicry of human physiological systems**, The 6th Annual Symposium, OK-MPS Validation Center, Ohsong, Korea, July 2022
28. **Microengineered biomimicry of human physiological systems**, The Skirball Institute Seminar, NYU School of Medicine, New York, May 2022
29. **Microengineered biomimicry of human physiological systems**, Society of Toxicology (SOT) FutureTox V: New Technologies to Evaluate Organ-Specific Effects of Drugs and Chemicals, UNC, Chapel Hill, May 2022
30. **Microengineered biomimicry of human physiological systems**, 11th Annual Biomedical Engineering Symposium, McMaster University, Canada, March 2022

31. **Microengineered biomimicry of human physiological systems**, Organoids and Microfluidics in Cancer Research, Northwestern University, February 2022
32. **Microengineered biomimicry of human physiological systems**, The Sue & Bill Gross Stem Cell Research Center Annual Symposium, University of California, Irvine, January 2022
33. **Microengineered biomimicry of human physiological systems**, The Penn's Institute for Diabetes, Obesity, and Metabolism; the Division of Endocrinology, Diabetes, and Metabolism; and the Diabetes Research Center Seminar, January 2022
34. **Keynote: Microengineered biomimicry of human physiological systems**, The Berlin-Brandenburg School for Regenerative Therapies Symposium, November 2021
35. **Microengineered biomimicry of human physiological systems**, DOD/CDMRP-NIDCD Joint Workshop on Improving Ex-vivo Models to Accelerate Therapies to Treat Hearing Loss, November 2021
36. **Microengineered biomimicry of human physiological systems**, Department of Biomedical Engineering, Columbia University, October 2021
37. **Microengineered biomimicry of human physiological systems**, Stem Cell institute Seminar Series, University of Minnesota, October 2021
38. **Microengineered biomimicry of human physiological systems**, Next Generation Tissue Engineering, September 2021
39. **Microengineered biomimicry of human physiological systems**, Department of Chemical and Biomolecular Engineering, Sogang University, Seoul, Korea, August 2021
40. **Microengineered biomimicry of human physiological systems**, Global Health Integrated Organoid Convening, Bill and Melinda Gates Foundation, July 2021
41. **Microengineered biomimicry of human physiological systems**, Pathology and Laboratory Medicine Grand Rounds, University of Pennsylvania, May 2021
42. **Organs- and organoids-on-a-chip technology**, Engineering Organoids and Organs, Cell Press Symposia, April 2021
43. **How simple is complex enough?** Engineering Organoids and Organs, Cell Press Symposia, April 2021
44. **Microengineered Bio-mimicry of Human Physiological Systems**, Korean Disease Control and Prevention Agency, April 2021
45. **Microengineered Bio-mimicry of Human Physiological Systems**, CPSS Science Talks, AstraZeneca, March 2021
46. **Microengineered Bio-mimicry of Human Physiological Systems**, Vascular Science Seminar Series, National Heart and Lung Institute, Imperial College London, February 2021
47. **Keynote: Microengineered Bio-mimicry of Human Physiological Systems**, IEEE EMBS Mini-Symposium on Micro & Nanotechnology in Medicine, December 2020
48. **Microengineered Bio-mimicry of Human Physiological Systems**, The Frontiers of Science Lecture, Penn School of Dental Medicine, Philadelphia, PA, November 2020
49. **Keynote: Microengineered Bio-mimicry of Human Physiological Systems**, Children's Healthcare of Atlanta's 19th annual Donald Schaffner Conference, Atlanta, GA, November 2020
50. **Microengineered Bio-mimicry of Human Physiological Systems**, American Society of Reproductive Medicine (ASRM) Virtual Meeting, October 2020
51. **Microengineered models of reproductive organs**, American Society of Reproductive Medicine (ASRM) Virtual Meeting, October 2020
52. **Microengineered Bio-mimicry of Human Physiological Systems**, Korean Society for Biotechnology and Bioengineering Annual Meeting, October 2020
53. **Microengineered Bio-mimicry of Human Physiological Systems**, The 7th International Symposium of the Stem Cell and Regenerative Medicine Institute, Samsung Medical Center, Seoul, Korea, September 2020
54. **Microengineered Bio-mimicry of Human Physiological Systems**, SNUBH CAT-EBM Symposium, Seoul National University Bundang Hospital, Korea, September 2020
55. **Microengineered Bio-mimicry of Human Physiological Systems**, The 3rd NYU Biomedical and Biosystems Conference, Abu Dhabi, January 2020
56. **Microengineered Bio-mimicry of Human Physiological Systems**, GlaxoKlineSmith (GSK), Collegeville, PA, November 2019
57. **Microengineered Bio-mimicry of Human Physiological Systems**, Emulate Inc., Boston, MA, November 2019
58. **Plenary: Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, The 32nd Annual Meeting of the Japanese Society for Alternatives to Animal Experiments, Tsukuba, Japan, November 2019
59. **Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, Department of Chemical Engineering, Sogang University, November 2019
60. **Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, NIH Tissue Chips & Biomaterials Workshop, NIH, MD, October 2019
61. **Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, Cold Spring Harbor Stem Cell Biology, Cold Spring Harbor, NY, September 2019
62. **Microengineered Bio-mimicry of Human Physiological Systems**, Department of Mechanical Engineering, Korea University, August 2019
63. **Microengineered Bio-mimicry of Human Physiological Systems**, Ministry of Food and Drug Safety, Osong, Korea, July 2019
64. **Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, The National Assembly Forum 4th Industrial Revolution in Biomedical Science and Animal Ethics, Seoul, Korea, May 2019
65. **Human Organs-on-a-chip: Microengineered Bio-mimicry of Human Physiological Systems**, Hallym University Medical Center, Korea, May 2019

- 66. Distinguished lectureship: *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Institute of Medical Science (IMS), University of Toronto, Toronto, Canada, May 2019
- 67. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, 2019 Korean Society for Biotechnology and Bioengineering Spring Meeting and International Symposium, Jeju, Korea, April, 2019
- 68. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, National Institute of Biomedical Imaging and Bioengineering, NIH, Bethesda, MD, USA, March 2019
- 69. Plenary: *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Current Status and Future of Cell Assay Technology, National Institute for Advanced Industrial Science and Technology (AIST), Tsukuba, Japan, January 2019
- 70. *One New Thing***, IEEE Micro and Nanotechnology in Medicine Meeting, Kauai, HI, USA, December 2018
- 71. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Mathematical Sciences, University of Delaware, Newark, DE, USA, December 2018
- 72. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Materials Research Society Meeting (MRS) Fall Meeting, Boston, MA, USA, November 2018
- 73. Plenary: *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Lush Conference, Berlin, Germany, November 2018
- 74. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Mechanical and Aerospace Engineering, Ohio State University, Columbus, OH, USA, October 2018
- 75. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, The 4th International Cancer Immunotherapy Conference, New York, NY, USA, September 2018
- 76. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Organ-on-a-Chip World Congress and 3D Bioprinting, San Diego, CA, USA, September 2018
- 77. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, The 11th World Congress for Microcirculation, Vancouver, Canada, September 2018
- 78. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Physics, Seoul National University, Seoul, Korea, August 2018
- 79. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Chemistry, Seoul National University, Seoul, Korea, August 2018
- 80. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, August 2018
- 81. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Biology, Seoul National University, Seoul, Korea, August 2018
- 82. *Microengineered Physiological Bio-mimicry: Human Organs-on-Chips***, Department of Mechanical Engineering, Seoul National University, Seoul, Korea, August 2018
- 83. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, The 11th Annual Business Regenerative Medicine Conference, Philadelphia, PA, USA, July 2018
- 84. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Yonsei University College of Medicine, Seoul, Korea, June 2018.
- 85. Keynote: *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, The 10th International Symposium on Microchemistry and Microsystems, Busan, Korea, June 2018
- 86. Distinguished lectureship: *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, McPherson Eye Research Institute (MERI) Endowed Lecturer, University of Wisconsin, Madison, WI, USA, May 2018
- 87. Keynote: *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Ontario-on-a-Chip/ NSERC TOeP research day, University of Toronto, Toronto, Canada, May 2018
- 88. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Advancing Gene Editing Technologies for the Treatment of Cystic Fibrosis Lung Disease, NHLBI, Bethesda, MD, USA, March 2018
- 89. *New Developments in Organ Chip Designs: The Placenta-Chip and Eye-Chip***, 2018 AAAS Annual Meeting, Austin, TX, USA, February 2018
- 90. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Michigan Center on Lifestage Environmental Exposures and Disease, University of Michigan, Ann Arbor, MI, USA, January 2018
- 91. *Microengineered Lung-on-a-Chip Technology***, 3D In Vitro TB Granuloma Model, National Institute of Allergy and Infectious Diseases (NIAID), Rockville, MD, USA, January 2018
- 92. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, British Thoracic Society Winter Meeting 2017, London, UK, December 2017
- 93. Keynote: *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Launch & Strategic Visioning Workshop, Canadian Center for Alternatives to Animal Methods, University of Windsor, Windsor, Ontario, Canada, October 2017
- 94. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, US-Korea Conference on Science, Technology and Entrepreneurship 2017 (UKC), Washington, DC, USA, August 2017
- 95. *Leveraging Organ-on-a-Chip Technology to Study the Human Placenta***, The Human Placenta Project (HPP) Annual Meeting, Bethesda, MD, USA, July 2017
- 96. *Microengineered Physiological Bio-mimicry; Human Organs-on-Chips***, Division of Pulmonary and Critical Care Medicine, Seoul National University, Seoul, Korea, July 2017

97. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Mechanical Engineering, Inha University, Incheon, Korea, July 2017
98. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, SELECTBIO Organ-on-a-chip Workshop, Boston, USA, July 2017
99. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Oak Ridge National Laboratory, Oak ridge, TN, USA, June 2017
100. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, 21st Congress of International Society of Aerosols in Medicine (ISAM), Santa Fe, NM, USA, June 2017
101. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Baltimore, MD, USA, May 2017
102. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Penn Cardiovascular Institute (CVI), University of Pennsylvania, Philadelphia, PA, USA, May 2017
103. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, SELECTBIO Organ-on-a-chip Workshop, Munich, Germany, May 2017
104. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, "Printing the Future of Therapeutics in 3D", Peter Wall Institute for Advanced Studies, University of British Columbia, Vancouver, Canada, May 2017
105. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Experimental Biology Annual Meeting, Chicago, IL, USA, April 2017
106. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Institute for Advanced Materials, Devices, and Nanotechnology (IAMDN), Rutgers University, NJ, USA, April 2017
107. **Distinguished lectureship: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Annual Research Day, Royal College of Surgeons in Ireland, Dublin, Ireland, March 2017
108. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The Society of Toxicology (SOT) Annual Meeting, Baltimore, MD, USA, March 2017
109. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Biomedical Engineering, UC Davis, CA, USA, February 2017
110. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The 2017 Association for Research in Otolaryngology Meeting, Baltimore, MD, USA, February 2017
111. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Society of Toxicology of Canada (STC) 47th Annual symposium, Ottawa, Canada, December 2016
112. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, IEEE Micro and Nanotechnology in Medicine Meeting, Hawaii, HI, USA, December 2016
113. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, NIDDK workshop "The Adipose Tissue Niche: Role in Health and Disease", Bethesda, MD, USA, November 2016
114. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, LifeNet Health Institute for Regenerative Medicine, Virginia Beach, VA, November 2016
115. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Penn Institute for Regenerative Medicine (IRM), Philadelphia, PA, USA, November 2016
116. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Korean Society of Biotechnology and Bioengineering (KSBB) Annual Meeting, Gwangju, Korea, October 2016
117. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Middle Atlantic Reproduction and Teratology Association (MARTA) Annual Meeting, Lawrenceville, NJ, USA, October 2016
118. **Analytical Chemistry Young Innovator Award Lectureship: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, microTAS2016, Dublin, Ireland, October, 2016
119. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Organ-on-a-chip Workshop, University of Hong Kong, Hong Kong, October 2016
120. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The National Toxicology Program Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM), Bethesda, MD, USA, September 2016
121. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Reproductive Sciences Seminar (RSS) Series, University of Colorado School of Medicine, Denver, USA, May 2016
122. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, High-Content & Phenotypic Screening, Cambridge, UK, May 2016
123. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Microtechnologies in Medicine and Biology (MMB), Seoul, Korea, April 2016
124. **Microengineered physiological pulmonary models**, New Developments in *In Vitro* Models of the Pulmonary Epithelium, European Respiratory Society (ERS), Berlin, Germany, April 2016
125. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The Placental Association of the Americas Annual Symposium, Montreal, Canada, March 2016
126. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Pittcon 2016, Atlanta, GA, USA, March 2016
127. **Microengineered Human Organs-on-Chips for Toxicology Research**, Workshop on Alternative Methods in Inhalation Toxicology, The Society of Toxicology (SOT) Annual Meeting, New Orleans, LA, USA, March 2016

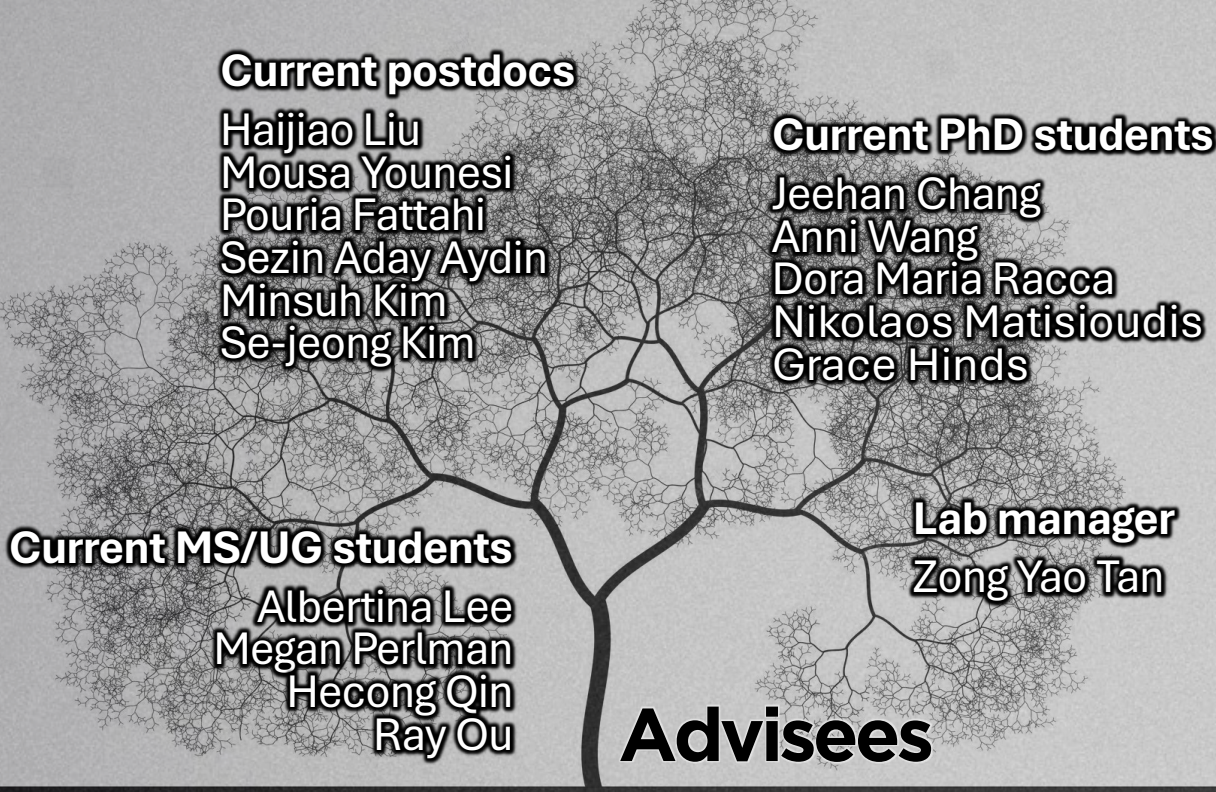
128. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, CE Advanced Course, The Society of Toxicology (SOT) Annual Meeting, New Orleans, LA, USA, March 2016
129. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Mother Infant Research Institute (MIRI), Tufts University School of Medicine, Boston, MA, USA, November 2015
130. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Chemical and Petroleum Engineering, University of Kansas, Lawrence, KS, USA, November 2015
131. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Pharmacology and Physiology, Drexel University College of Medicine, Philadelphia, PA, USA, November 2015
132. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Bio and Brain Engineering, KAIST, Daejeon, Korea, October 2015
133. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, 3D Cell Culture: Organoid, Spheroid, and Organ-on-a-Chip Models, Boston, MA, USA, November 2015
134. **Organs-on-Chips and microphysiological systems**, MicroTAS2015, Gyeongju, Korea, October 2015
135. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, US-Korea Conference on Science, Technology and Entrepreneurship 2015 (UKC 2015), Atlanta, GA, USA, July 2015
136. **Plenary: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Inflammation at Barrier Surfaces: From Bench to Bedside, McGill University, Montreal, Canada, June 2015
137. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, 10th Anniversary Symposium, Center of Excellence in Environmental Toxicology, Philadelphia, PA, USA, May 2015
138. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Digestive Disease Week (DDW) 2015 Meeting, Washington, DC, USA, May 2015
139. **Microengineered Bio-mimicry of Human Organs**, TEDxLMSD, Ardmore, PA, USA, May 2015
140. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Mechanical Engineering, University of California, Santa Barbara, CA, USA, April 2015
141. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Chemical Engineering, Columbia University, New York, NY, USA, April 2015
142. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Penn Fibrosis Symposium, University of Pennsylvania, Philadelphia, PA, USA, April 2015
143. **Microengineered Bio-mimicry of Human Organs**, TEDxPenn, Philadelphia, PA, USA, April 2015
144. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Pharmacology and Toxicology, Rutgers University, Piscataway, NJ, USA, March 2015
145. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, American Association of Anatomists (AAA) Annual Meeting, Boston, MA, USA, March 2015
146. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Department of Biomedical Engineering, New Jersey Institute of Technology, Newark, NJ, USA, March 2015
147. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The Society of Toxicology (SOT) Annual Meeting, San Diego, CA, USA, March 2015
148. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Penn LAM Symposium, Airways Biology Initiative, University of Pennsylvania, PA, USA, February 2015
149. **Plenary: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The 4th International Conference on Additive Manufacturing and Bio-Manufacturing, Beijing, China, November 2014
150. **Plenary: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The 13th Biennial International Endotoxin and Innate Immune Society (IEIIS) Meeting, Salt Lake City, UT, USA, October 2014
151. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Schepens Eye Institute, Harvard Medical School, Boston, MA, USA, October 2014
152. **Microengineered Physiological Bio-mimicry for Pulmonary Research**, European Respiratory Society International Congress 2014, Munich, Germany, September 2014
153. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, The 7th World Congress in Biomechanics, Boston, MA, USA, July 2014
154. **Microengineered Physiological Bio-mimicry for Lung Research**, Thomas L. Petty Aspen Lung Conference, Aspen, CO, USA, June 2014
155. **Keynote: Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Horizons in Human Cells: At the interface of science, engineering, medicine & society, University of Edinburgh, Scotland, May 2014
156. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, 13th Annual World Pharma Congress, Boston, MA, USA, May 2014
157. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Center for Research on Reproduction and Women's Health, University of Pennsylvania, PA, USA, February 2014
158. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Institute for Medicine and Engineering Seminar Series, University of Pennsylvania, PA, USA, November 2013
159. **Microengineered Physiological Bio-mimicry; Human Organs-on-Chips**, Pulmonary, Allergy, and Critical Care Division Research Conference, University of Pennsylvania, PA, USA, November 2013

160. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, 8th Cell Based Assay & Screening Technologies Conference, San Francisco, CA, USA, November 2013
161. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, USA, November 2013
162. **Microengineered Physiological Biomimicry; Human Organs-on-Chips**, Scheie Eye Institute, University of Pennsylvania, PA, USA, October 2013
163. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Mechanical Engineering, Texas Tech University, TX, USA, October 2013
164. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, International Symposium on Grand Challenges for the Integration of Stem cells, Nanomaterials, and Biomanufacturing, Chinese Academy of Sciences, Shanghai, China, June 2013
165. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, 2013 Innovative Research Institute for Cell Therapy Spring Symposium, Seoul, Korea, May 2013
166. **Plenary: Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, The 33rd Annual Conference of the Korean Society of Critical Care Medicine, Seoul, Korea, April 2013
167. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Pathology, Samsung Medical Center, Seoul, Korea, April 2013
168. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Chemical and Biological Engineering, Seoul National University, Seoul, Korea, March 2013
169. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Internal Medicine, Asan Medical Center, Seoul, Korea, March 2013
170. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Dermatology, Seoul National University Hospital, Seoul, Korea, March 2013
171. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, The 13th Annual International Proteomics Conference, Seoul, Korea, March 2013
172. **A Human Breathing Lung-on-a-chip**, The 2013 FSU Life Sciences Symposium: Modeling Human Disease, College of Medicine, Florida State University, Tallahassee, FL, USA, February 2013
173. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Electronics and Telecommunications Research Institute, Seoul, Korea, February 2013
174. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea, February 2013
175. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Anesthesiology, Seoul National University Hospital, Seoul, Korea, January 2013
176. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Division of Nephrology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea, November 2012
177. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, The Annual Meeting of the Korean Society of Mechanical Engineering, Changwon, Korea, November 2012
178. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Biotronics 2012: International Conference on Biosensors, Biochips, and Bioelectronic Devices, Gwangju, Korea, October 2012
179. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Nano Korea: International Symposium on Nanotechnology, Seoul, Korea, July 2012
180. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Society for Laboratory Automation and Screening in Asia, Shanghai, China, June 2012
181. **How can we model the complex alveolar microenvironment?** American Thoracic Society, San Francisco, CA, USA, May 2012
182. **A Human Breathing Lung-on-a-chip**, The 2012 Annual Spring Meeting of The Korean Biochip Society, Korea, May 2012
183. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Mechanical Engineering, Sogang University, Seoul, Korea, April 2012
184. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Korea Institute of Science and Technology, Seoul, Korea, March 2012
185. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, School of Mechanical and Aerospace Engineering, Seoul National University, Seoul, Korea, March 2012
186. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Mechanical Engineering, Stanford University, Stanford, CA, USA, February 2012
187. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Society for Laboratory Automation and Screening, San Diego, CA, USA, February 2012
188. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Biomedical Engineering, Boston University, Boston, MA, USA, February 2012

189. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Institute for Environmental Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA, USA, January 2012
190. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, USA, January 2012
191. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, USA, January 2012
192. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, USA, November 2011
193. **(Plenary lecture) A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Annual Merck Research Laboratories Respiratory Symposium, Boston, MA, USA, November 2011
194. **Plenary: A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, International Society for the Study of Xenobiotics, Atlanta, GA, USA, October 2011
195. **A Human Breathing Lung-on-a-chip for Drug Screening and Nanotoxicology Applications**, Stem Cells and Cell Therapies in Lung Biology and Lung Diseases, Burlington, VT, USA, July 2011

196. **A Human Breathing Lung-on-a-chip**, American Thoracic Society, Denver, CO, USA, April 2011
197. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Mechanical Engineering Seminar, MIT, Boston, MA, USA, March 2011
198. **Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications**, Department of Bioengineering Seminar, University of California, Berkeley, CA, USA, February 2011
199. **A Human Breathing Lung-on-a-chip**, Watching the Lung Work, Germany, September 2010
200. **A Human Breathing Lung-on-a-chip**, World Congress of Biomechanics, Singapore, August 2010





Current postdocs

Haijiao Liu
Mousa Younesi
Pouria Fattahi
Sezin Aday Aydin
Minsuh Kim
Se-jeong Kim

Current PhD students

Jeehan Chang
Anni Wang
Dora Maria Racca
Nikolaos Matisioudis
Grace Hinds

Current MS/UG students

Albertina Lee
Megan Perlman
Hecong Qin
Ray Ou

Lab manager

Zong Yao Tan

Advisees

Former lab members

Jungwook Paek (postdoc): Assistant Professor, Electrical & Computer Engineering, SUNY Binghamton

Sunghee Estelle Park (PhD student): Assistant Professor, Biomedical Engineering, Purdue University

Woo-Ri Shin (postdoc): Assistant Professor, Kyungsang Natl University

Andrei Georgescu (PhD student): Founding CEO, Vivodyne Inc.

Ju Young Park (postdoc): CTO, BioBricks Inc.

Jeongyun Seo (PhD student): Samsung Advanced Institute of Technology

Mark Mondrinos (postdoc): Assistant Professor, Biomedical Engineering, Tulane University

Keon Woo Kwon (postdoc): Research Scientist, LegoChem

Cassidy Blundell (PhD student): Partner, Mission BioCapital

Nicole Lu (postdoc): Senior Research Scientist, Alcon

Minseon Cho (postdoc): Research Scientist, Tavotek Biotherapeutics

Alina Dong (MS student): BE PhD student, Penn

Marco Fu (MS student): Manufacturing Engineer, Bioplate

Ning Guo (MS student): Research Scientist, George Xu's group at Penn Medicine

Tracy Gao (MS student): Pharmacology PhD student, Duke

Shwan Kang (UG/MS student): BE PhD student, Harvard

Jasmine Shong (lab manager): Scientist, BlueWhale Bio

Samira Mehta (UG/MS student): Student, U of Michigan Med School

Jessica Schwartz (UG/MS student): Student, Hofstra Medical School

Toren Arginteanu (UG/MS student): MD/PhD student, Johns Hopkins

Aidi Liu (MS student): PhD student, Rice

Joseph Song (MS student): PhD student, Northwestern

Jeong Min Oh (Research Technician): BE PhD student, USC

Alex Yi (MS student): Engineer, Tara Biosystems

Emily Tess (MS student): Corporate Development, Glycomine

Nan-Kun Wu (MS student): CTBC Venture Capital

David Conegliano (MS student): Staff Automation Engineer, Calico Life Sciences

David Kwon (MS student): Project Manager, Siemens Healthineers

Visiting professors

Young Jae Cho, M.D.

Professor
Division of Pulmonary and Critical Care Medicine, Seoul National University Hospital, Korea

Chul Ho Chang, M.D., Ph.D.
Professor of Anesthesiology and Pain Medicine, College of Medicine, Yonsei University, Korea

Sun Min Kim, Ph.D.
Professor of Mechanical Engineering, Inha University, Korea

Thesis committee

Griffin Spsychalski (BE: D. Issadore)

Abraham Waldman (BE: J. Cremins)

Adam Suppes (CBE: D. Hammer)
The effect of T-lymphocyte upstream migration under shear flow (2022)

Lauren Beck (BE: A. Raj)
Establishing an imaging-based methodology to systematically measure design principles of organoid systems (2021)

Sohaib Hashimi (BE: R. Heuckeroth)
Role of ATCG2 mutations in visceral myopathy (2020)

Mina Chen (BE: J. Burdick)
Cell delivery to the heart with injectable hyaluronic acid hydrogels for improved vascularization (2019)

Nicholas Anderson (BE: D. Hammer)
The biophysics of leukocyte adhesion deficiency”, Ph.D. in Chemical and Biomolecular Engineering (2019)

Steven Henry (BE: D. Hammer)
Biophysics of human neutrophil haptokinesis (2015)

Su Chin Heo (BE: R. Mauck)
Differentiation induces dynamic alterations in mesenchymal stem cell nuclear architecture and mechanotransduction (2015)

Teaching

University of Pennsylvania

ENM2400 [Differential Equations & Linear Algebra](#) (F2024, F2023)

BE3500 [Introduction to Biotransport Processes](#) (S2104-S2020)

BE5100 [Biomechanics](#) (F2014-F2021, S2023, S2024)

BE4900 & 4920 [Independent Project in Bioengineering](#) (2014-2016)

Seoul National University

BME461.62 [Biological Micro-Electro-Mechanical Systems](#) (2012-2013)

BME461.619 [Special Topics in Biomedical Engineering](#) (2012-2013)

M801.135 [Introduction to Bioengineering](#) (2012)

Harvard University

CB399 [Microfluidics Nanocourse](#) (2011)

University Service

Member, Faculty Council, SEAS, Penn (2024-present)

Chair, Graduate Admissions Committee, Bioengineering Graduate Group (2022-present)

Member, Professor of Practice Search Committee, SEAS, Penn (2023-present)

Member, Graduate Admissions Committee, Bioengineering Graduate Group (2021-2022)

Member, Internal Advisory Board, Signh Center for Nanotechnology, Penn (2020-2023)

Member, Faculty Search Committee, Department of Bioengineering, SEAS, Penn (2016-2017)

Professional service

Grant reviews:

NIH study sections (ad hoc) (2013-present)
Samsung Research Funding for Future Technology (2016-2019)
The Austrian Science Funds (2015)
The Lord Dowding Fund for Humane Research (2015)
Air Force Office of Scientific Research (2014)
Severo Ochoa Programme, Spanish National Agency for Scientific Evaluation (ANEP) (2014)
Agency for Science, Research & Technology (A*STAR), Singapore (2013)

Meeting organization:

Advisory Committee, NCATS/HESI MPS Annual Meetings (2021)
Session Chair, Biomedical Engineering Society (BMES) Annual Meeting (2019)
Chair, 2018 Microtechnologies in Medicine and Biology (MMB) (2018)
Session Chair, 2018 Annual AAAS Meeting (2018)
Session Organizer and Chair, 2017 Society for Laboratory Automation and Screening (SLAS) Meeting (2017)
Session Organizer and Chair, 2016 Society of Toxicology (SOT) Annual Meeting (2016)
Session Chair, Nanoengineering for Medicine and Biology (NEMB) (2016)
Session Organizer and Chair, 2015 US-Korea Conference on Science, Technology, and Entrepreneurship (2015)

Meeting organization (continued):

Session Organizer and Chair, 2015 Society of Toxicology (SOT) Annual Meeting (2015)
Session Chair, 2015 TERMIS World Congress (2015)
Session Chair, Biomedical Engineering Society (BMES) Annual Meeting (2015)
Track Chair for Micro/Nano Technologies Track, 2015 Society for Lab Automation and Screening (SLAS) Meeting (2015)
Session Organizer and Chair, 2014 Society for Leukocyte Biology (SLB)-International Endotoxin and Innate Immunity Society (IEIIS) Meeting (2014)
Associate Track Chair for Micro/Nano Technologies Track, 2014 Society for Lab Automation and Screening (SLAS) Meeting (2014)
Session Chair, The 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (2014)
Session Chair, The 47th Korean Society of Medical & Biological Engineering Annual Meeting (2013)
Session Chair, Biomedical Engineering Society (BMES) Annual Meeting (2012)
Session Organizer and Chair, 2012 Society for Laboratory Automation and Screening (SLAS) Meeting (2012)

Editorial activities:

Co-Editor-in-Chief, *Microphysiological Systems* (2022-present)
Associate Editor-in-Chief, *Microphysiological Systems* (2017-2022)
Guest Editor, *Advanced Drug Delivery Reviews* (2022)
Guest Editor, *Nanoconvergence* (2021)
Guest Editor, *APL Bioengineering* (2019)
Guest Associate Editor, *Journal of Laboratory Automation* (2014)

Professional service

Journal reviews:

Science
Nature
Nature Biotechnology
Nature Communications
Nature Methods
Nature Biomedical
Engineering
Science Advances
Science Translational
Medicine
PNAS
Cell Stem Cell
Cell reports
Lab on a Chip
Biomicrofluidics
Scientific Reports
Applied Physics Letters
Advanced Functional
Materials
Advanced Healthcare
Materials
Tissue Engineering
PLOS ONE
Journal of
Microelectromechanical
Systems
Journal of Micromechanics
and Microengineering
Molecular Biology of the

Cell
Nanomedicine
Journal of Nanoscience and
Nanotechnology
Biomedical Microdevices
Biomedical Engineering
Letters
International Journal of
Precision Engineering and
Manufacturing
Microfluidics and
Nanofluidics
Experimental Biology and
Medicine
Biomaterials Science
Biotechnology Journal
Advanced Science

