

## **Melody A. Swartz, PhD**

William B. Ogden Professor  
Institute for Molecular Engineering and Ben May Department of Cancer Research  
University of Chicago

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**Research interests:** Understanding and manipulation of lymphatic growth and function as it relates to cancer and immunity. My lab uses interdisciplinary approaches and seeks to describe systems-level behaviors, both for fundamental insight and novel translational strategies. Current research themes include (1) the role of tumor-associated lymphatics in modulating anti-tumor immunity, (2) the role of lymphatic drainage in maintaining peripheral tolerance, (3) therapeutic lymphangiogenesis for immunotherapy, (4) targeting the lymphatics with synthetic nanoparticle vaccines, (5) the role of interstitial flow in regulating tissue homeostasis.

### **Education**

1991 B.S. Chemical Engineering, Johns Hopkins University, Baltimore, MD  
1998 Ph.D. Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA;  
Thesis: “Interstitial-Lymphatic Transport Phenomena”; Advisor: Prof. Rakesh K. Jain  
1998-9: Postdoctoral Fellow, Pulmonary Division, Brigham & Women’s Hospital, Harvard Medical School, Boston, MA; Advisor: Prof. Jeffrey Drazen

### **Appointments**

1999-2004: Assistant Professor, Departments of Chemical & Biological Engineering and Biomedical Engineering (joint), Northwestern University, Evanston, IL  
2003-2006: Assistant Professor, EPFL, Institute of Bioengineering, School of Life Sciences  
2007-2010 Associate Professor (with tenure), Institute of Bioengineering, School of Life Sciences, EPFL (joint appointments in the Institute of Chemistry and Chemical Engineering (ISIC) and Institute for Experimental Cancer Research (ISREC))  
2010-2016: Professor, Institutes of Bioengineering and Cancer Research, EPFL (note: between July 2014-Dec 2016, a partial appointment to facilitate transition to Chicago)  
2012-2014: Director, Institute of Bioengineering, EPFL  
2014- William B. Ogden Professor, Institute for Molecular Engineering, University of Chicago  
*-Joint appointment in the Ben May Department for Cancer Research*  
*-Committee on Immunology, Committee on Cancer Biology*

### **Honors and Awards**

2016 Wendy Chaite Leadership Award in Lymphatic Research  
2014 Freshman Convocation Keynote Speaker, University of Alaska, Anchorage  
2014 Plenary Lecture, World Congress of Biomechanics, Boston  
2013 Britton Chance Lecture, University of Pennsylvania, Philadelphia  
2012 MacArthur Foundation Fellow  
2012 Fellow of the Biomedical Engineering Society  
2011 Prix Leenaards for the Promotion of Scientific Research  
2010 Robert Wenner Prize for Cancer Research (*from the Swiss Cancer League*)  
2010 Elected chair of the Lymphatic Gordon Research Conference for 2014  
2008, 2013 European Research Council Investigator Awards  
2008 *J Controlled Release* “Highest Cited Original Research Award 2006” (Reddy et al)  
2007 Elected Fellow, American Institute for Medical and Biological Engineering (AIMBE)  
2007 *Annals of Biomedical Eng.* “Highest cited paper of 2005” (Pedersen & Swartz)  
2006 Ed Yellin “Integrative Cardiovascular Physiology” Award, CSDS  
2006 Popular Science Magazine’s “Brilliant 10”  
2002 Arnold and Mabel Beckman Young Investigator

2002 NSF CAREER Award  
2001 Rita Schaffer Young Investigator Award, Biomedical Engineering Society  
2001 Young Investigator Award, Microcirculatory Society  
2000, 2005, 2009 Department of Defense Concept Award for Breast Cancer Research  
1999 Donald and June Brewer Junior Faculty Endowed Chair  
1996 Mary Weideman Young Investigator Award, Microcirculation Society  
1991 Watson Foundation Fellow

### **Professional Service**

#### **Conference organization:**

Keystone Conference on Stromal Cells in Immunity (2016), Co-chair (with Shannon Turley and Burkhard Ludewig )  
AACT Special Conference on Metastasis (2015), Co-chair (with Jeffrey Pollard and Bruce Zetter)  
Gordon Research Conference in Molecular Mechanisms in Lymphatic Function and Disease, Organizing Committee, 2004; Vice Chair (2012); Chair (2014)  
AACT Special Conference on Complexity of Tumor Microenvironments (2011), Co-chair (with Lisa Coussens and Yves DeClerck)  
NCI Workshop "Gradients in the Tumor Microenvironment" (2010), Chair  
Microcirculatory Society, Programs & Meetings Committee member, 2010-present

#### **Editorial positions:**

J. Biomechanics, Associate Editor (2011-present)  
Angiogenesis, Editorial Board (2011-present)  
Cancer Immunology Research, Editorial Board (2013-present)  
Biomaterials, Editorial Board (2011-present)  
J. Royal Soc. Interface, Editorial Board (2014-present)  
Scientific Reports, Editorial Board (2014-present)  
Biomechanics and Modeling in Mechanobiology, Editorial Board (2015-present)

#### **Grant review panels:**

European Research Council (ERC), Panel member, LS6 Immunity and Infection (2013-17);  
National Institutes of Health, ad hoc reviewer for: Lymphatic Research panel (2015, 2013, 2011, 2008), Cardiovascular Sciences Integrated Review Group Special Emphasis Panel (2006), Modeling and Analysis of Biological Systems Study Section (2006), Tissue Engineering Review Panel (2002);  
U.S. National Science Foundation, Biomedical Engineering Program Panel (2001, 2002, 2008);  
Swiss National Science Foundation, Division 3 grant reviewer (2006-present); U.S. Department of Defense, Breast Cancer Research Program Panel 2002; NC3R (U.K.), 2007; Medical Research Council (U.K.) 2005-2006, German Research Foundation, 2006; Lymphatic Research Foundation, 2006-2008, NASA, Biofluids Panel 2003; Science Foundation Ireland, Mechanical Eng panel (2005)

#### **Other professional society service:**

American Association for Cancer Research (AACR), Steering Committee of the Tumor Microenvironment Working Group, 2015-17; 2017 Annual Meeting organizer for Major Symposium on Metastasis.  
SystemsX.ch, Scientific Board of Directors, 2009-2013.  
Biomedical Engineering Society (BMES), Elected to Board of Directors (2002-2005), Membership Committee Chairman (2000-2003), Annual Meeting session organizer for: "Lymphatic and Interstitial Transport and Remodeling" (2001), "Interstitial and Lymphatic Transport Mechanisms"(2000), "Transport and Targeting Issues in Drug and Gene Delivery" (2000), "Lung Mechanobiology" (2004 and 2005), "Cancer & Bioengineering" (2005), "Immunoengineering" (2011 and 2012); Annual meeting track chair for "Cell and Molecular Engineering" (2006), "New Frontiers in Biomedical Engineering" (2010), "Cellular & Molecular Bioengineering" (2014).  
European Society of Biomechanics, Scientific advisory board, 2008 meeting  
European Society of Microcirculation, Session organizer "Lymphatic Biology", 2008

World Congress of Biomechanics. Session organizer for “Lymphatic Biomechanics and Tissue Stress” and “Engineering Vascularized Organs”; track chair for Tissue Engineering; Munich, Aug 2006  
American Society of Mechanical Engineers / Bioengineering Division (ASME/BED): Annual Meeting Organizing Committee, 2001; Session Organizer and Chair, “Tissue and Cell Mechanics” 2001; Session Organizer and Chair, “Cell and Matrix Mechanics in Tissue Engineering”, 2003.  
American Inst. of Chemical Engineers (AIChE): Session Organizer and Chair, “Cancer and Cardiovascular Diseases”, 1999, 2001, 2002

**Peer-reviewed Manuscripts (#denotes corresponding author pubs, \*contributed equally)**

*Web of Science h-index = 53, total # citations = 11,500 as of Feb 10, 2017*

- #(125) M Fankhauser, MA Broggi, L Potin, N Bordry, L Jeanbart, AW Lund, E DaCosta, S Hauert, M Rincon, C Tremblay, DE Speiser, and MA Swartz. Tumor lymphangiogenesis promotes T cell infiltration and potentiates immunotherapy in melanoma. *Sci. Trans. Med.* (in revision)
- #(124) E Guç, PS Briquez, D Foretay, MA Fankhauser, JA Hubbell, WW Kilarski, and MA Swartz. Local control of lymphangiogenesis with engineered fibrin-binding VEGF-C. *Biomaterials* (in minor revision).
- #(123) V Triacca, E Guç, WW Kilarski, M Pisano, MA Swartz (2017). Transcellular pathways in lymphatic endothelial cells regulate changes in solute transport by fluid stress. *Circ Res.* (in press); doi:10.1161/CIRCRESAHA.116.309828.
- (122) C Cianciaruso, EA Phelps, M Pasquier, R Hamelin, D Demurtas, M Alibashe Ahmed, L Piemonti, S Hirosue, MA Swartz, M De Palma, JA Hubbell, S Baekkeskov. Primary human and rat beta cells release the intracellular autoantigens GAD65, IA-2, and proinsulin in exosomes together with cytokine-induced enhances of immunity (2017). *Diabetes* 66(2):460-73. Doi:10.2337/db16-0671.
- (121) T Manzo, T Sturmheit, V Basso, E Petrozziello, R Hess Michelini, M Riba, M Freschi, AR Elia, M Grioni, F Curnis, MP Protti, TN Schumacher, R Debets, MA Swartz, A Corti, M Bellone, and A Mondino (2016). T cells redirected to a minor histocompatibility antigen instruct intratumoral TNF $\alpha$  expression and empower adoptive cell therapy for solid tumors. *Cancer Res.* (in press); doi:10.1158/0008-5472.CAN-16-0725.
- (120) HM Langevin, P Keely, J Mao, LM Hodge, R Schleip, G Deng, B Hinz, MA Swartz, BA de Valois, S Zick, T Findley (2016). Connecting (T)issues: How research in fascia biology can impact integrative oncology. *Cancer Res.* 76(21):6159-62.
- (119) H He, JJ Mack, E Güç, CM Warren, ML Squadrito, WW Kilarski, C Baer, RD Freshman, AI McDonald, S Ziyad, MA Swartz, M De Palma, ML Iruela-Arispe (2016). Perivascular macrophages limit permeability. *Arterioscler. Thromb. Vasc. Biol.* pii:ATVBAHAHA. 116.307592 (epub ahead of print).
- #(118) AW Lund, M Wagner, M Fankhauser, ES Steinskog, MA Broggi, S Spranger, TF Gajewski, K Alitalo, HP Eikesdal, H Wiig, and MA Swartz (2016). Lymphatic vessels regulate immune microenvironments in human and murine melanoma. *J. Clin. Invest.* 126(9):3389-402.
- (117) Julier Z, de Titta A, Grimm AJ, Simeoni E, Swartz MA, Hubbell JA (2016). Fibronectin EDA and CpG synergize to enhance antigen-specific Th1 and cytotoxic responses. *Vaccine* 34(21):2453-9.
- (116) Caucheteux SM, Mitchell JP, Ivory MO, Hirosue S, Hakobyan S, Dolton G, Ladell K, Miners K, Price DA, Kan-Mitchell J, Sewell AK, Nestle F, Moris A, Karoo RO, Birchall JC, Swartz MA, Hubbel JA, Blanchet FP, Piguët V (2016). Polypropylene sulfide nanoparticle p24 vaccine promotes dendritic cell-mediated specific immune responses against HIV-1. *J Invest Dermatol.* 136(6):1172-81.
- #(115) L Jeanbart and MA Swartz (2015). Engineering opportunities in cancer immunotherapy. *Proc. Natl. Acad. Sci. U.S.A.* 112(47):14467-72.
- #(114) M Ballester, L Jeanbart, A de Titta, C Nembrini, BJ Marsland, JA Hubbell, and MA Swartz (2015). Nanoparticle conjugation enhances the immunomodulatory effects of intranasally delivered CpG in house dust mite-allergic mice. *Sci. Rep.* Sep 21;5:14274. doi: 10.1038/srep14274.
- (113) MG Procopio, C Laszlo, D Al Labban, D Kim, P Bordignon, S-H Jo, S Goruppi, E Menietti, P Ostano, U Ala, P Provero, W Hoetzenecker, V Neel, WW Kilarski, MA Swartz, C Brisken, K

- Lefort, GP Dotto (2015). Combined CSL and p53 downregulation promotes cancer-associated fibroblast activation. *Nat. Cell Biol.* 17(9):1193-204. doi: 10.1038/ncb3228
- (112) R Mezyk-Kopec, B Wyroba, K Stalinska, T Prochnicki, K Wiatrowska, WW Kilarski, MA Swartz, and J Bereta (2015). ADAM17 promotes motility, invasion, and sprouting of lymphatic endothelial cells. *PLoS One*, 10(7):10.1371/journal.pone.0132661.
- #(111) M Pisano, V Triacca, KA Barbee, and MA Swartz (2015). An in vitro model of the tumor-lymphatic microenvironment with simultaneous transendothelial and luminal flows reveals mechanisms of flow-enhanced invasion. *Integr. Biol.* 7(5):525-33.
- #(110) L Jeanbart, IC Kourtis, AJ van der Vlies, MA Swartz\*, JA Hubbell\* (2015). 6-Thioguanine-loaded polymeric micelles deplete myeloid-derived suppressor cells and enhance the efficacy of T cell immunotherapy in tumor-bearing mice. *Cancer Immunol. Immunother.* 64(8):1033-46.
- (109) EL Kuan, S Ivanov, EA Bridenbaugh, G Victora, W Wang, EW Childs, AM Platt, CV Jakubzick, RJ Mason, AA Gashev, M Nussenzweig, MA Swartz, ML Dustin, DC Zawieja, GJ Randolph (2015). Collecting lymphatic vessel permeability facilitates adipose tissue inflammation and distribution of antigen to lymph node-homing adipose tissue DCs. *J. Immunol.* 194:5200-10.
- #(108) MA Swartz (2014). Immunomodulatory roles of lymphatic vessels in cancer progression. *Cancer Immunol. Res.* 2(8):701-7.
- #(107) S Hirose, E Vokali, V Raghavan, M Rinçon-Restrepo, AW Lund, P Corthésy-Henrioud, F Capotosti, C Halin-Winter, S Hugues, and MA Swartz (2014). Steady-state antigen scavenging, cross-presentation and CD8<sup>+</sup> T cell priming: a new role for lymphatic endothelial cells. *J. Immunol.* 192(11):5002-11.
- #(106) L Jeanbart, M Ballester, A de Titta, P Corthésy, P Romero, JA Hubbell, MA Swartz (2014). Enhancing efficacy of anticancer vaccines by targeted delivery to tumor-draining lymph nodes. *Cancer Immunol Res.* 2(5):436-47.
- #(105) E Güç, M Fankhauser, AW Lund, MA Swartz\*, and WW Kilarski\* (2014). Long-term intravital immunofluorescence imaging of tissue matrix components with epifluorescence and two-photon microscopy. *J. Vis. Exp.* Apr 22;(86). doi: 10.3791/51388.
- #(104) J Dubrot, FV Duraes, L Potin, F Capotosti, D Brighouse, T Suter, S LeibundGut-Landmann, N Barbi, W Reith, MA Swartz\*, and S Hugues\* (2014). Lymph node stromal cells acquire peptide-MHCII complexes from dendritic cells and induce antigen-specific CD4<sup>+</sup> T cell tolerance. *J Exp. Med.* 221(6):1153-66.
- (103) MM Martino, PS Briquez, E Güç, F Tortelli, WW Kilarski, S Metzger, JJ Rice, GA Kuhn, R Muller, MA Swartz, and JA Hubbell (2014). Growth factors engineered for super-affinity to extracellular matrix enhance tissue healing. *Science* 343(6173):885-8.
- # (102) M Wu & MA Swartz (2014). Modeling tumor microenvironments in vitro. *J Biomech Eng.* 136 (2):SI 10.1115/1.4026447.
- #(101) C.M. Card, S.S. Yu, M.A. Swartz (2014). Emerging roles of lymphatic endothelium in regulating adaptive immunity. *J. Clin. Invest.* 124(3):943-52.
- #(100) A de Titta, M Ballester, Z Julier, C Nembrini, L Jeanbart, AJ van der Vlies, MA Swartz\*, and JA Hubbell\* (2013). Nanoparticle conjugation of CpG enhances adjuvancy for cellular immunity and memory recall at low dose. *Proc Natl Acad Sci USA.* 110(49):19902-7
- (99) DJ Irvine, MA Swartz, and GL Szeto (2013). Engineering synthetic vaccines using cues from natural immunity. *Nature Mater.* 12(11):978-90.
- #(98) SN Thomas, E Vokali, AW Lund, JA Hubbell, and MA Swartz (2014). Targeting the tumor-draining lymph node with adjuvanted nanoparticles reshapes the anti-tumor immune response. *Biomaterials*, 35(2):814-24.
- #(97) JM Rutkowski, JE Ihm, ST Lee, WW Kilarski, VI Greenwood, MC Pasquier, A Quazzola, D Trono, JA Hubbell, and MA Swartz (2013). VEGFR-3 neutralization inhibits ovarian lymphangiogenesis, follicle maturation, and murine pregnancy. *Am. J. Pathol.* 183(5):1596-607.
- (96) Kilarski WW, Muchowicz A, Wachowska M, Mężyk-Kopec R, Golab J, Swartz MA, Nowak-Sliwinska P (2014). Optimization and regeneration kinetics of lymphatic-specific photodynamic therapy in the mouse dermis. *Angiogenesis* 17(2):347-57.
- (95) BJ Kim, P Hannanta-Anan, M Chau, YS Kim, MA Swartz, M Wu (2013). Cooperative roles of SDF-1a and EGF gradients on tumor cell migration revealed by a robust 3D microfluidic model. *PLoS One* 8(7):e68422.

- (94) S Traub, J Morgner, MM Martino, S Höning, MA Swartz, SA Wickström, JA Hubbell, SA Eming (2013). The promotion of endothelial cell attachment and spreading using FNIII10 fused to VEGF-A165. *Biomaterials* 34(24):5958-68.
- #(93) IC Kourtis, S Hirosue, A deTitta, J Stegmann, JA Hubbell, and MA Swartz (2013). Peripherally administered nanoparticles target monocytic myeloid cells, secondary lymphoid organs and tumors in mice. *PLoS One* 8(4):e61646.
- #(92) WW Kilarski, E Güç, JCM Teo, SR Oliver, AW Lund, MA Swartz (2013). Intravital immunofluorescence for visualizing the microcirculatory and immune microenvironments in the mouse ear dermis. *PLoS One* 8(2):e57135.
- #(91) A Stano, EA Scott, KY Dane, MA Swartz\*, and JA Hubbell\* (2013). Tunable T cell immunity towards a protein antigen using polymersomes versus solid-core nanoparticles. *Biomaterials* 34(17):4339-46.
- (90) C. Martel, W. Li, B. Fulp, A.M. Platt, E.L. Gautier, M. Westerterp, R. Bittman, A.R. Tall, S.-H. Chen, M.J. Thomas, D. Kreisel, M.A. Swartz, M.G. Sorci-Thomas, and G.J. Randolph (2013). Macrophage reverse cholesterol transport in mice relies on the lymphatic vasculature. *J. Clin. Invest.* 123(4):1571-9. doi: 10.1172/JCI63685.
- (89) Platt AM, Rutkowski JM, Martel C, Kuan EL, Ivanov S, Swartz MA, Randolph GJ. (2013) Normal dendritic cell mobilization to lymph nodes under conditions of severe lymphatic hypoplasia. *J Immunol.* 2013 May 1;190(9):4608-20. doi: 10.4049/jimmunol.1202600.
- #(88) JM Munson, RV Bellamkonda, and MA Swartz (2013). Interstitial flow in a 3D microenvironment increases glioma invasion by a CXCR4-dependent mechanism. *Cancer Res.* Mar 1; 73(5):1536-46.
- (87) S Das, M Czarnek, M Bzowska, R Mężyk-Kopeć, K Stalińska, B Wyroba, J Sroka, J Jucha, D Deneka, P Stokłosa, J Ogonek, MA Swartz, Z Madeja, J Bereta (2012). ADAM17 silencing in mouse colon carcinoma cells: The effect of tumoricidal cytokines and angiogenesis. *PLoS One* 7(12):e50791.
- (86) A Stano, C Nembrini, MA Swartz, JA Hubbell, E Simeoni (2012). Nanoparticle size influences the magnitude and quality of mucosal immune responses after intranasal immunization. *Vaccine* Dec 14;30(52):7541-6.
- #(85) MA Swartz, S Hirosue, JA Hubbell (2012). Engineering approaches to immunotherapy. *Sci. Transl. Med.* Aug 22;4:148rv9.
- #(84) SN Thomas, JM Rutkowski, M Pasquier, EL Kuan, K Alitalo, GJ Randolph, and MA Swartz (2012). Weak humoral immunity and acquired autoimmunity in mice with impaired dermal lymphatic drainage. *J. Immunol.* Sep 1;189(5):2181-90.
- #(83) EA Scott, A Stano, M Gillard, AC Maio-Liu, MA Swartz\*, JA Hubbell\* (2012). Dendritic cell activation and T cell priming with adjuvant- and antigen-loaded oxidation-sensitive polymersomes. *Biomaterials* 33:6211-19.
- (82) H Wiig and MA Swartz (2012). Interstitial fluid and lymph formation and transport: Physiological regulation and roles in inflammation and cancer. *Physiol Rev* July;92(3):1005-60.
- (81) JK Eby, KY Dane, CP O'Neil, S Hirosue, MA Swartz, and JA Hubbell. Polymer micelles with pyridyl disulfide-coupled antigen traffic through lymphatics and show enhanced cellular responses following immunization. *Acta Biomater.* 8(9):3210-7
- #(80) A.W. Lund, F.V. Duraes, S. Hirosue, S.N. Thomas, C. Nembrini, S. Hugues, and M.A. Swartz (2012). Tumor VEGF-C promotes immune tolerance and tumor antigen cross-presentation by lymphatics. *Cell Reports* 1(3): 191 - 199. Comment: Cancer Res. 72:1589-90, 2012; named "Best of Cell Reports 2012" (among most downloaded).
- #(79) MA Swartz and AW Lund (2012). Lymphatic and interstitial flow in the tumor microenvironment: Linking tumor mechanobiology with lymph node immunity. *Nature Rev. Cancer* 12:210-219.
- (78) MA Swartz, I Noriho, EW Roberts, S Sangaletti, MH Wong, FE Yull, LM Coussens, and YA DeClerck (2012). Tumor Microenvironment Complexity: Emerging Roles in Cancer Therapy. *Cancer Res.* 15;72(10):2473-2480.
- #(77) U Haessler, JCM Teo, D Foretay, P Renaud, MA Swartz (2012). Migration dynamics of breast cancer cells in a tunable 3D interstitial flow chamber. *Integr. Biol.* 4:401-9.

- (76) T Roose and MA Swartz (2012). Multiscale modeling of lymphatic drainage from tissues using homogenization theory. *J. Biomech.* 45(1):107-15.
- #(75) C Nembrini, A Stano, KY Dane, M Ballester, A van der Vlies, BJ Marsland, MA Swartz\*, and JA Hubbell\* (2011). Nanoparticle conjugation of antigen enhances cytotoxic T cell responses in pulmonary vaccination. *Proc. Natl. Acad. Sci. U.S.A.* 108(44):E989-97
- (74) D Velluto, SN Thomas, E Simeoni, MA Swartz, and JA Hubbell (2011). PEG-b-PPS-b-PEI micelles and PEG-b-PPS/PEG-b-PPS-b-PEI mixed-micelles as non-viral vectors for plasmid DNA: tumor immunotoxicity in B16F10 melanoma. *Biomaterials* 32:9839-47.
- (73) KY Dane, C Nembrini, AA Tomei, JK Eby, CP O'Neil, D Velluto, MA Swartz, L Inverardi, and JA Hubbell (2011). Nano-sized drug-loaded micelles deliver payload to lymph node immune cells and prolong allograft survival. *J. Controlled Rel.* 156(2):154-60.
- #(72) M. Ballester, C. Nembrini, N. Dhar, A. de Titta, C. de Piano, M. Pasquier, E. Simeoni, A.J. van der Vlies, J.D. McKinney, J.A. Hubbell, and M.A. Swartz (2011). Nanoparticle conjugation and pulmonary delivery enhance the protective efficacy of Ag85B and CpG against tuberculosis. *Vaccine* 29:6959– 6966.
- #(71) U. Haessler, M. Pisano, M. Wu, and M.A. Swartz (2011). Dendritic cell chemotaxis in 3D under defined chemokine gradients reveals differential response to CCL21 and CCL19. *Proc. Natl. Acad. Sci. U.S.A.* 108:5614-18
- #(70) AC Shieh, HA Rozansky, B Hinz and MA Swartz (2011). Tumor cell invasion is promoted by interstitial flow-induced matrix priming by stromal fibroblasts. *Cancer Res.* 71(3):790-800.
- #(69) SN Thomas, AJ van der Vlies, CP O'Neil, SS Yu, TD Giorgio, MA Swartz\*, and JA Hubbell\* (2011). Engineering complement activation on polypropylene sulfide vaccine nanoparticles. *Biomaterials* 32(8):2194-203.
- (68) A Stano, AJ van der Vlies, MM Martino, MA Swartz, JA Hubbell, and E Simeoni (2011). PPS nanoparticles as versatile delivery system to induce systemic and broad mucosal immunity after intranasal administration. *Vaccine* 29(4):804-12.
- #(67) AC Shieh and MA Swartz (2011). Regulation of tumor invasion by interstitial fluid flow. *Physical Biol.* 8: 015012.
- #(66) S Hirose, IC Kourtis, AJ van der Vlies, JA Hubbell\*, and MA Swartz\* (2010). Antigen delivery to dendritic cells by poly (propylene sulfide) nanoparticles with disulfide conjugated peptides: Cross-presentation and T cell activation. *Vaccine* 28:7897-7906.
- #(65) AW Lund and MA Swartz (2010). Role of lymphatic vessels in tumor immunity: Passive conduits or active participants? *J Mammary Gland Biol Neoplasia* 15:341-52.
- #(64) JD Shields, I.C. Kourtis, AA Tomei, J. Roberts, and MA Swartz (2010). Induction of lymphoid-like stroma and immune escape by tumors that express the chemokine CCL21. *Science* 328(5979):749-52. (comment: "Perspectives," *Science* 328:697-7, 2010; "Research Highlights," *Nature Rev. Cancer*, 10(5):292, 2010).
- #(63) DO Miteva, JB Dixon, W Kilarski, JM Rutkowski, JD Shields, MA Swartz (2010). Transmural flow modulates cell and fluid transport functions of lymphatic endothelium: A potential early cue for inflammation. *Circ. Res.* 106(5):920-31.
- #(62) JA Pedersen, S. Lichter, MA Swartz (2010). Cells in 3D matrices under interstitial flow: Effects of pericellular matrix alignment on cell shear stress and drag forces. *J Biomech* 43:900-5.
- #(61) C Bonvin, J Overney, AC Shieh, JB Dixon, MA Swartz (2010). A multichamber fluidic device for long-term 3D cultures under interstitial flow with live imaging. *Biotechnol Bioeng* 105(5):982-91.
- #(60) JM Rutkowski, CE Markhus, C.C. Gyenge, K. Alitalo, H. Wiig, MA Swartz (2010). Dermal collagen and fat accumulation correlate with tissue swelling and hydraulic conductivity in murine lymphedema. *Am J Pathol.* 176(3):1122-9.
- #(59) JA Hubbell\*, SN Thomas, MA Swartz\* (2009). Materials engineering for immunomodulation. *Nature* 462(7272):449-460.
- #(58) AA Tomei, S Siegert, MR Britschgi, SA Luther, MA Swartz (2009). Fluid flow regulates stromal cell organization and CCL21 expression in a tissue-engineered lymph node model. *J Immunol* 183(7):4273-83 (featured article).

- (57) HY Lim, JM Rutkowski, J Helft, ST Reddy, MA Swartz, GJ Randolph, V Angeli (2009). Hypercholesterolemic mice exhibit lymphatic vessel dysfunction and degeneration. *Am J Pathol* 175(3):1328-1337.
- #(56) JB Dixon, S Rangunathan, MA Swartz (2009). A tissue engineered model of the intestinal microenvironment for evaluating lipid uptake into lacteals. *Biotech Bioeng* 103(6):1224-35. (Cover photo)
- (55) K Bérubé, M Aufderheide, D Breheny, R Clothier, R Combes, R Duffin, B Forebs, M Gaça, A Gray, I Hall, M Kelly, M Lethem, M Liebsch, L Merolla, JP Morin, JC Seagrave, MA Swartz, TD Tetley, and M Umachandran (2009). In vitro models of inhalation toxicity and disease: Report of a FRAME workshop. *Alt Lab Anim* 37:1-53.
- (54) U Haessler, Y Kalinin, MA Swartz, M Wu (2009). An agarose-based microfluidic platform with a gradient buffer for 3D chemotaxis studies. *Biomed. Microdev.* 11(4):827-35.
- #(53) AA Tomei, F Boschetti, F. Gervaso, MA Swartz (2009). Culturing 3D collagen cultures under well-defined dynamic strain: a novel strain device with a porous elastomeric support. *Biotech Bioeng* 103: 217-225 (featured “Spotlight”).
- #(52) A Issa, TX Le, AN Shoushtari, JD Shields, & MA Swartz (2009). VEGF-C and CCL21 in tumor cell – lymphatic crosstalk promote invasive phenotype. *Cancer Res.* 69:349-357.
- #(51) MA Swartz, JA Hubbell, and ST Reddy (2008). Lymphatic drainage function and its immunological implications: From dendritic cell homing to vaccine design. *Semin. Immunol.*, 20(2):147-56.
- (50) F Boschetti, AA Tomei, S Turri, MA Swartz, M Levi (2008). Design, fabrication and characterization of a composite scaffold for bone tissue engineering. *Int J Artif Org* 8:697-707.
- #(49) AA Tomei, MM Choe, and MA Swartz (2008). Effects of dynamic compression on lentiviral transduction in an in vitro airway wall model. *Am. J. Physiol. Lung Cell Mol. Physiol.* 294:L79-L86.
- #(48) MA Swartz and ME Fleury (2007). Interstitial flow and its effects in soft tissues. *Annu. Rev. Biomed. Eng.* 9:229-56
- #(47) ST Reddy, AJ van der Vlies, E Simeoni, V Angeli, GJ Randolph, MA Swartz\*, and JA Hubbell\* (2007). Exploiting lymphatic transport and complement activation in nanoparticle vaccines. *Nature Biotechnol.* 25(10):1159-64.
- #(46) JD Shields, ME Fleury, C. Yong, AA Tomei, GJ Randolph, and MA Swartz (2007). Autologous chemotaxis as a mechanism of tumor cell homing to lymphatics via interstitial flow and autocrine CCR7 signaling. *Cancer Cell* 11:526-538. (comment J. Cell Biol. 178:4; won Servier Award by the Microcirculatory Society in 2008; ranked “must read” by Faculty of 1000).
- #(45) JM Rutkowski and MA Swartz (2007). A driving force for change: Interstitial flow as a morphoregulator. *Trends Cell Biol.* 17(1):44-50.
- (44) AL Thawgawng, RS Ruoff, MA Swartz, MR Glucksberg (2007). An ultra-thin PDMS membrane as a bio/micro-nano interface: fabrication and characterization. *Biomed Microdev* 9(4):587-95
- #(43) J Goldman, JM Rutkowski, JD Shields, MC Pasquier, Y Cui, HG Schmoekel, S Wiley, DJ Hicklin, B Pytowksi, MA Swartz (2007). Cooperative and redundant roles of VEGFR-3 and VEGFR-2 signaling in adult lymphangiogenesis. *FASEB J.* 21:1003-12.
- (42) J Goldman, KA Conley, A Raehl, DM Bondy, B Pytowski, MA Swartz, JM Rutkowksi, DB Jaroch, EL Ongstad (2007). Regulation of lymphatic capillary regeneration by interstitial flow in skin. *Am. J. Physiol, Heart Circ. Physiol.* 292(5):H2176-83
- (41) AL Thawgawng, MA Swartz, MR Glucksberg, and RS Ruoff (2007). Bond-detach lithography: A method for micro/nanolithography by precision PDMS patterning . *Small* 3 (1): 132-138.
- #(40) CE Helm, AH Zisch, and MA Swartz (2007). Engineered blood and lymphatic capillaries in 3D VEGF-fibrin-collagen matrices with interstitial flow. *Biotech. Bioeng.* 96(1):167-176.
- #(39) JA Pedersen, F. Boschetti, MA Swartz (2007). Effects of extracellular matrix architecture on velocity and shear stress profiles on cells within a 3-D collagen matrix. *J. Biomech.* 40:1484-92.
- #(38) ST Reddy, MA Swartz\*, and JA Hubbell\* (2006). Targeting dendritic cells with biomaterials: Developing the next generation of vaccines. *Trends Immunol.* 7(12):573-9

- #(37) ST Reddy, DA Berk, RK Jain, and MA Swartz (2006). A sensitive *in vivo* model for quantifying interstitial transport of injected macromolecules and nanoparticles. *J. Appl. Physiol.* 101(4):1162-9.
- #(36) MM Choe, AA Tomei, and MA Swartz (2006). 3D culture model of the human airway mucosa. *Nature Protocols* 1:357-362.
- (35) LG Griffith and MA Swartz (2006). Capturing complex 3D tissue physiology in vitro. *Nature Rev. Mol. Cell Biol.* 7:211-224.
- #(34) JM Rutkowski, M. Moya, J. Johannes, J. Goldman, and MA Swartz (2006). Secondary lymphedema in the mouse tail: lymphatic hyperplasia, VEGF-C upregulation, and the protective role of MMP-9. *Microvasc. Res.* 72:161-171.
- #(33) JM Rutkowski, KC Boardman, and MA Swartz (2006). Characterization of lymphangiogenesis in a model of adult skin regeneration. *Am. J. Physiol. Heart Circ. Physiol.* 291: H1402–H1410.
- #(32) ME Fleury, KC Boardman, and MA Swartz (2006). Autologous morphogen gradients by subtle interstitial flow and matrix interactions. *Biophys. J.* 91(1) 113–121.
- #(31) MM Choe, PHS Sporn, and MA Swartz (2006). Extracellular matrix remodeling by dynamic strain in a 3D airway wall model. *Am. J. Resp. Cell Mol. Biol.* 35(3):306-13.
- #(30) ST Reddy, A. Rehor, HG Schmoekel, JA Hubbell, and MA Swartz (2006). Targeting dendritic cells in lymph nodes with PPS-PEG nanoparticles. *J Contrl Rel* 112(1):26-34 (awarded “Highest Cited Original Research Award 2006” by J Contr. Rel).
- #(29) CP Ng and MA Swartz. (2006). Mechanisms of interstitial flow-induced remodeling of fibroblast-collagen cultures. *Ann Biomed Eng* 34(3):446-54.
- (28) LG Griffith, MA Swartz, and RT Tranquillo (2006). Education for careers in tissue engineering and regenerative medicine. *Ann Biomed Eng* 34(2):265-9.
- #(27) CE Helm, ME Fleury, AH Zisch, F Boschetti, and MA Swartz (2005). Synergy between interstitial flow and VEGF directs capillary morphogenesis in vitro through a gradient amplification mechanism. *Proc Natl Acad Sci USA* 44:15779-15784.
- #(26) JA Pedersen and MA Swartz (2005). Mechanobiology in the third dimension. *Ann. Biomed. Eng.* 33(11):1469-1490. (named “best paper of 2005” for most downloads between 2005-2007)
- #(25) C Yong, EA Bridenberg, DC Zawieja, MA Swartz (2005). Microarray analysis of VEGF-C responsive genes in cultured primary human lymphatic endothelial cells. *Lymphatic Res Biol* 3:183-207.
- #(24) CP Ng, B Hinz, and MA Swartz (2005). Interstitial fluid flow induces myofibroblast differentiation and collagen alignment in vitro. *J Cell Sci* 118(20):4731-4739.
- (23) GJ Randolph, V Angeli, and MA Swartz (2005). Dendritic cell trafficking to lymph nodes via lymphatic vessels. *Nature Rev. Immunol.* 5: 1-12.
- #(22) J Goldman, TX Le, M Skobe, and MA Swartz (2005). Overexpression of VEGF-C causes transient lymphatic hyperplasia but not increased lymphangiogenesis in regenerating skin. *Circ. Res.* 96:1193-1199 (Comment: *Circ Res.* 96:1132-1134, 2005).
- #(21) B Pytowski, J Goldman, K Persaud, Y Wu, L Witte, DJ Hicklin, M Skobe, KC Boardman, and MA Swartz (2005). Complete and specific inhibition of adult lymphatic regeneration by a novel VEGFR-3 neutralizing antibody. *J Natl Cancer Inst* 97(1):14-21 (Comments: *J. Natl. Cancer Inst.* 97(1):1-2, 2005; *Lab Invest.* 85 (6): 719, 2005; *Lymphatic Res. Biol.* 3(2):87-88, 2005).
- #(20) CP Ng, CE Helm, & MA Swartz (2004). Interstitial flow differentially stimulates blood and lymphatic endothelial cell morphogenesis *in vitro*. *Microvasc Res* 68:258-264.
- #(19) KC Boardman and MA Swartz (2003). Interstitial fluid flow as a guide for lymphangiogenesis. *Circ. Res.* 92:801-808, 2003 (Comment: *Circ. Res.* 92:701-3).
- #(18) MA Swartz (2003). Signaling in morphogenesis: Biotransport cues in morphogenesis. *Curr. Opin. Biotech.* 14:547-550.
- #(17) MM Choe, PHS Sporn, and MA Swartz (2003). An *in vitro* airway wall model of remodeling. *Am. J. Physiol.* 285(2):L427-33.
- #(16) CP Ng and MA Swartz (2003). Fibroblast alignment under interstitial fluid flow using a novel 3-D tissue culture model. *Am J Physiol* 284:H1771-7.
- #(15) MA Swartz and KC Boardman (2002). The role of interstitial stress in lymphatic function and lymphangiogenesis. *Ann. N.Y. Acad. Sci.* 979:197-210.
- (14) MA Swartz. Physiology of the lymphatic system (2001). *Adv. Drug Deliv Rev.* 50:3-20.



- (13) MA Swartz and M Skobe (2001). Lymphatic function, lymphangiogenesis, and cancer metastasis. *Microsc. Res. Tech.* 55(2):92-99.
- (12) DJ Tschumperlin, JD Shively, MA Swartz, ES Silverman, KJ Haley, G Raab, and JM Drazen (2002). *Am J Physiol Lung Cell Mol Physiol* 282: L904-L911.
- (11) MA Swartz, DJ Tschumperlin, RD Kamm, and JM Drazen (2001). Mechanical stress is communicated between cell types to elicit matrix remodeling. *Proc Natl Acad Sci USA* 98:6180-6185.
- (10) A Losken, MA Swartz, AD Van den Abbeele, RK Jain, and SA Slavin (2001). A potential murine model for flap related investigations. *Plastic Reconstr Surg* 107(6):1504-1508.
- (9) PA Netti, DA Berk, MA Swartz, AJ Grodzinsky, and RK Jain (2000). Role of extracellular matrix assembly in interstitial transport in solid tumors. *Cancer Res* 60(9):2497-2503.
- (8) MA Swartz, A Kaipainen, PA Netti, C Brekken, Y Boucher, AJ Grodzinsky, and RK Jain (1999). Mechanics of interstitial-lymphatic fluid transport: theoretical foundation and experimental validation. *J Biomech* 32:1297-1301.
- (7) MA Swartz, CK Kristensen, S Roberge, RJ Melder, and RK Jain (1999). Cells shed from tumors show reduced *in vitro* clonogenicity and *in vivo* tumorigenicity. *Br J Cancer* 81:756-759.
- (6) SA Slavin, AD Van den Abbeele, A Losken, MA Swartz\*, and RK Jain\* (1999). Return of lymphatic function after flap transfer for acute lymphedema. *Ann Surg* 229:421-427.
- (5) DM Eckmann, MA Swartz, MR Glucksberg, N Gavriely, and JB Grotberg (1998). Perfluorocarbon induced alterations in pulmonary mechanics. *Artif. Cells, Blood Sub., & Immob. Biotech.* 26:259-71.
- (4) DM Eckmann, MA Swartz, N Gavriely, MR Glucksberg, and JB Grotberg (1998). Influence of intravenous perfluorocarbon administration on the dynamic behavior of lung surfactant. *Artif Cells Blood Sub Immob Biotech* 26: 359-66.
- (3) M Jeltsch, A Kaipainen, V Joukov, X Meng, M Lakso, H Rauvala, M Swartz, D Fukumara, RK Jain, and K Alitalo (1997). Hyperplasia of lymphatic vessels in VEGF-C transgenic mice. *Science* 276:1423-5.
- (2) DA Berk, MA Swartz, AJ Leu, and RK Jain (1996). Transport in lymphatic capillaries: II. Microscopic velocity measurement with fluorescence recovery after photobleaching. *Am J Physiol* 270:H330-337.
- (1) MA Swartz, DA Berk, and RK Jain (1996). Transport in lymphatic capillaries: I. Macroscopic measurement using residence time distribution analysis. *Am J Physiol* 270:H324-H329.

### **Invited editorials**

- Swartz MA (2015). Tissue mechanics: Cell jam. *Nature Mater.* 14(10):970-1.
- Swartz MA (2014). Inflammatory lymphangiogenesis in postpartum breast tissue remodeling. *J. Clin. Invest.* 124(9):3704-7.

### **Book chapters**

- JD Shields and MA Swartz\*. Physiology of the lymphatic vasculature in healthy tissues and cancer. In: S.A. Stacker and M.G. Achen (eds), "Lymphangiogenesis in Cancer Metastasis"; Cancer Metastasis – Biology and Treatment 13, Springer, 2009.

### **Patents**

- "Immunofunctional nanoparticles" U.S. Application
- "CCR7 ligand delivery and co-delivery in immunotherapy", U.S. Application

### **Teaching**

- Courses taught at University of Chicago:
- Engineering Principles of Conservation* (2016 -)
- Transport Phenomena II* (2017-)
- Courses taught at EPFL (average of 80-90 lecture hours per year):
- Advanced Transport Phenomena* (BS course; 2006-2014)
- Material and Energy Balances* (BS course in Life Sciences; 2009)
- Responsible Research Conduct* (graduate course; 2005-2015)

*Biological and Physiological Transport (graduate course; 2004-2006)*

*Biomechanics (part of multi-instructor course, 2004, 2012)*

*Portion of Bioengineering Design for 3<sup>rd</sup> year students (2005-2014)*

Courses taught at Northwestern (average 84 lecture hours per year):

*Transport in Living Systems (CHEM\_ENG 371)*

*Introduction to Fluid Mechanics (CHEM\_ENG 321)*

*Introduction to Biomedical Fluid Mechanics (BME 270)*

*Advanced Tissue Mechanics (BME 371)*

*Introduction to Biomedical Engineering (BME 101)*

**Postdocs trained (\*indicates current faculty):**

**Dr. Maria Stella Sasso** (11/2015-present). PhD in Oncology, University of Padova, Italy

**Dr. Katharina Maisel** (3/2015-present). PhD Chemical Engineering, Johns Hopkins Univ.

**Dr. Luis Alonzo** (2/2015-present). PhD Bioengineering, Univ. California, Irvine.

**Dr. Cara Buchanan** (7/2013-present) PhD Bioengineering, Virginia Institute of Technology

**Dr. Maria Broggi** (7/2013-present) PhD Immunology, University of Basel, Switzerland

**Dr. Shann Yu** (3/2013-present) PhD Bioengineering, Vanderbilt University

**Dr. Alexandra Magold** (9/2011-1/2014). PhD Biology, EPFL, Switzerland. Currently: postdoctoral fellow, Weissman Institute, Israel.

**Dr. Catherine Card** (6/2012-5/2015). PhD Immunology, University of Manitoba. Currently: on maternity leave.

**Dr. Dan Bonner** (7/2012-6/2014, Whitaker International Fellow). PhD Medical Engineering and Physics, MIT and Harvard. Currently: Scientist, Entrega Biosciences, Boston, MA

**Dr. Ed Phelps** (7/2012-present; Whitaker International Fellow; joint with Hubbell and Baekkeskov labs). PhD Biomedical Engineering, Georgia Tech.

\***Dr. Jennifer Munson** (11/11-9/13, Whitaker International Fellow). PhD Biomedical Engineering, Georgia Tech. Currently: Assistant Professor of Bioengineering, Univ. Virginia.

**Dr. Isabelle Magold** (9/11-12/13). PhD Neuroscience, EPFL. Currently postdoc at the Weissman Institute of Technology, Tel Aviv.

**Dr. Francesca Capotosti** (1/11-12/12). PhD Biochemistry, Univ. of Lausanne. Currently: scientist at AC Immune, Lausanne.

**Dr. Ryan Oliver** (3/10-4/14). PhD Biophysics, Ohio State Univ. Currently: Instructor, University of Alaska, Fairbanks.

\***Dr. Evan Scott** (8/09-9/13, Whitaker International Fellow). PhD Biomedical Eng, Washington University. Currently: Assistant Professor of Biomedical Engineering, Northwestern University.

\***Dr. Amanda Lund** (6/09-6/13). PhD Biology, Rensselaer Polytechnic Institute, New York. Currently: Assistant Professor, Oregon Health & Science University, Portland OR.

**Dr. Witold Kilarski** (1/08-present). PhD Vascular Biology, University of Uppsala, Sweden. Currently a senior scientist, Institute for Molecular Engineering, University of Chicago.

\***Dr. Susan Thomas** (6/08-9/11, Whitaker International Fellow). PhD Chemical Engineering, Johns Hopkins University. Currently: Assistant Professor, Georgia Institute of Technology.

**Dr. Sachiko Hirose** (4/08-present). Sci.D. Medical Engineering and Medical Physics, Massachusetts Institute of Technology, Cambridge MA. Currently senior scientist in my lab.

\***Dr. Jeremy Teo** (10/09-12/11). PhD Biomechanics, National Univ of Singapore. Currently: Assistant professor, Khalifa University, Abu Dhabi.

\***Dr. Adrian Shieh** (7/06-6/10, Whitaker International Fellow). PhD Bioengineering, Rice University. Currently: Assistant Professor, Drexel University, Philadelphia PA.

\***Dr. Brandon Dixon** (6/06-7/09, K99 Award from the NIH). PhD Biomedical Engineering, Texas A&M University. Currently: Associate Professor of Mechanical Engineering and Biomedical Engineering, Georgia Institute of Technology.

\***Dr. Jacqueline Shields** (12/04-11/10, Lymphatic Research Foundation-Susan G. Komen Young Investigator Scholar (2006); British Microcirculation Society Early Career Investigator Award (2007); Latsis Foundation Prize (2007), Servier Award, Microcirculatory Society (2008)). PhD Microvascular Physiology, University of Bristol, UK. Currently: Assistant Professor, Medical Research Council Cancer Cell Unit, Cambridge UK.

- Dr. Riccardo Nisato** (10/05-12/06, Roche Research Foundation Postdoctoral Fellow; Lymphatic Research Foundation-Susan G. Komen Young Investigator Scholar). PhD Biology, Univ. Geneva. Currently: Director of Manufacturing & Clinical Business Development, Stemedica Intl.
- \*Dr. Yingjie Cui, M.D.** (9/04-4/05). Currently: Associate Professor of Medicine, Case Western Reserve University
- \*Dr. Jeremy Goldman**, (4/02-8/04). PhD Biomedical Engineering, Northwestern. Univ. Currently: Associate Professor of Biomedical Engineering, Michigan Technological Institute

**PhD students (\*indicates current faculty):**

- Gustavo Montoya** (2016-), PhD student in Molecular Engineering, University of Chicago. Co-supervised with Prof. Juan de Pablo.
- Chitavi Mauloo** (2016-), PhD student in Molecular Engineering, University of Chicago. Co-supervised with Prof. Jeffrey Hubbell.
- Ruolan Zhou** (2016-), PhD student in Molecular Engineering, University of Chicago.
- Peyman Hossein** (2016-), PhD student in Molecular Engineering, University of Chicago.
- Léa Maillat** (2015-), PhD student in Molecular Engineering, University of Chicago.
- Sylvie Hauert** (2014-), PhD student in Chemical Engineering, EPFL, expected 2018. MS in Chemical Engineering, EPFL.
- Gabriele Galliverti** (2013-), PhD in Bioengineering, EPFL, expected 2017. MS in Molecular and Cellular Medical Biotechnology, Università San Raffaele, Milano, Italy.
- Lambert Potin** (2013-), PhD in Bioengineering, EPFL, expected 2017. MS in Bioengineering, EPFL.
- Ingrid van Mier** (2012-), PhD in Bioengineering, EPFL, expected 2016. MS in Pharmaceutical Sciences, ETH Zurich.
- Manuel Fankhauser** (2011-16), PhD in Bioengineering, EPFL, expected 2016. MS in Life Science, University of Amsterdam 2011. Currently: Postdoctoral fellow, EPFL.
- Efthymia Vokali**, (2011-16), PhD in Bioengineering, EPFL, March 2016. MS in Bioengineering, EPFL 2011. Currently: Postdoctoral fellow, EPFL.
- Marcela Rinçon Ristrepo** (2011-16), PhD in Bioengineering, EPFL, Jan. 2016. Currently: Postdoctoral fellow, University Hospital of Canton Vaud (CHUV).
- Valentina Triacca** (2009-14), PhD in Bioengineering, EPFL, May 2014. “*Active transport mechanisms by lymphatic endothelium and their modulation by inflammatory mediators*”. Currently: Postdoctoral fellow, University of Lausanne, Switzerland.
- Marco Pisano** (2009-14), PhD in Bioengineering, EPFL; May 2014. “*Engineering the lymphatic microenvironment for investigating tumor invasion, immune cell trafficking and parasite infection under relevant biomechanical conditions.*” Currently: Postdoctoral fellow, University of Lausanne, Switzerland.
- Laura Jeanbart** (2009-13), PhD in Bioengineering, EPFL, Nov 2013. “*Targeting and modulating tumor-associated sites with novel nanoparticle-based immunotherapies*”. Currently: Project Leader, Molecular Partners, Zurich Switzerland.
- Alexandre de Titta** (2009-14), PhD in Bioengineering, EPFL; June 2014. “*Engineering adjuvants for prophylactic and therapeutic subunit vaccines*”. Currently: Scientist for Nitto Denko, Lausanne, Switzerland.
- Esra Güç** (2009-14); PhD in Bioengineering, EPFL; June 2014. “*Engineering lymphangiogenesis: Methods, characterization and functional consequences*”. Currently: Postdoctoral fellow, University of Edinburgh.
- Marie Ballester** (2009-13); PhD in Bioengineering, EPFL; Feb 2013. “*Development of novel nanoparticle-based vaccines and immunotherapies: tuberculosis, lung metastasis, and allergy as models*”. Currently: Medical Resident, University of Lausanne.
- Sandeep Raghunathan** (2008-13); PhD in Bioengineering, EPFL, June 2013 “*Engineering nanoparticle vaccines: Design principles for lymphatic targeting*”. Currently: Co-Founder and Chief Scientific Officer, PB&B SA (MedTech startup company), Lausanne.
- Iraklis Kourtis** (2007-12); PhD in Bioengineering, EPFL; Jan. 2012 “*Therapeutic Immunomodulation of the Lymphoid-like Tumor Environment Using Nanoparticulate Formulations.*” MS in Biomedical Engineering, Technical University of Athens, Greece (2006). Currently: Project Manager, CellPly SA, Italy.

- Ulrike Haessler** (2006-10): PhD in Bioengineering, EPFL, August 2010. MS in Biology, Univ. of Manchester. (EPFL École Doctorale Fellow, 2006). Currently: Postdoctoral fellow, ETH Zurich.
- Dimana Miteva** (2006-10): PhD in Bioengineering, EPFL, April 2010 “*Biophysical regulation of lymphatic vessel function: Flow as a mediator of immune cell and fluid transport*”. (EPFL École Doctorale Fellowship, 2006). Currently: Clinical Research Scientist, Clinical Development, Celgene R&D.
- Amine Issa** (2004-08): PhD in Bioengineering, EPFL December 2008 “*Interplay between the VEGF-C/VEGFR-3 and CCL21/CCR7 axes in tumor cell invasion*”. Awards: Lymphatic Research Foundation-Susan G. Komen Young Investigator Scholarship (2006), Zweifach Student Travel Award, Microcirculatory Society (2007). Current position: Scientist, Novartis (Basel).
- \***Alice Tomei** (2004-08): PhD in Bioengineering, EPFL, Oct. 2008. (Awarded European Society of Biomechanics Student Award, 2006; Outstanding Poster Presentation Award, Annual Meeting of the Biomedical Engineering Society, 2005). Currently: Assistant Professor, Department of Biomedical Engineering, University of Miami.
- \***Sai Reddy** (2004-08): PhD in Bioengineering, EPFL, Oct. 2008. (Awarded KPMG Innovation Award for nanoparticle vaccine development, 2007). Currently: Assistant Professor of Biomolecular Engineering, ETH Zurich.
- \***Joseph Rutkowski** (2003-08): PhD in Bioengineering, EPFL, August 2008. (Awarded Lymphatic Research Foundation-Andrew Moisoff Young Investigator Scholarship, 2006). Currently: Assistant Professor of Physiology, Texas A&M University, College Station TX.
- Mark Fleury** (2003-08): PhD in Bioengineering, EPFL, June 2007. “*Effects of dynamic environments on extracellular morphogen gradients*”. (Awarded Biomedical Engineering Society Graduate Student Research Award (2006); Servier Award from the Microcirculatory Society (shared with Jacqui Shields), 2008). Currently: Associate Director of Science Policy, American Association for Cancer Research, Washington DC.
- Carolyn Yong** (2003-07): PhD in Bioengineering, EPFL, Aug 2007. “*In Vitro Lymphatic Endothelial Morphogenesis: Molecular vs. Biophysical Regulation*”. Currently: FDA Commissioner’s Fellow in Regenerative Medicine, U.S. Food and Drug Administration, Bethesda, MD.
- John Pedersen** (2002-06): MS in Biomedical Engineering, Northwestern Univ. 2004. “*A model system for observing fibroblast response to shear strain in 3D collagen gels*”. PhD in Biomedical Engineering, Oct. 2006 “*The Role of Extracellular Matrix Fibers in Modifying Pericellular Flow Fields in Interstitial Flow*”. Currently: Senior process development engineer, ev3, Minneapolis, MN.
- Cara-Lynn Helm** (2001-06): PhD in Chemical Engineering, May 2006 “*Tissue Engineering of Blood and Lymphatic Capillary Networks via Synergy of Mechanical and Chemical Cues*”. Awards: Outstanding Poster Presentation Award, Hilton Head Workshop on Cardiovascular Tissue Engineering (2004), Outstanding Poster Presentation Award, Annual Meeting of the Biomedical Engineering Society (2004), National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM) Fellowship recipient (2000-1). Currently scientist for the U.S. Patent Office.
- Chee Ping Ng** (2000-05): MS in Chemical Engineering, Northwestern Univ. 2002. “*Development of an interstitial flow model: Foundations for studying cell response and matrix remodeling in vitro*”. PhD in Chemical Eng., Northwestern Univ. 2005. “*Interstitial Flow: Effects on Cell Morphology, Differentiation, and Organization in Novel 3-Dimensional Tissue Cultures*”. Currently Research Scientist, Institute of Bioengineering and Nanotechnology, Singapore.
- Melanie Choe** (2000-05): MS in Biomedical Engineering, Northwestern Univ. 2002. “*A novel in vitro airway wall model of remodeling*”. PhD in Biomedical Eng., Northwestern Univ. “*Matrix Remodeling in a Novel Tissue Engineered Airway Wall Model: Effects of Compressive Strain*”. Currently a Scientist at the U.S. Food & Drug Administration, Bethesda MD.
- Kendrick Boardman** (1999-2004): Ph.D. in Biomedical Eng, Northwestern University, Oct 2004 “*Lymphangiogenesis in a Mouse Model of Skin Regeneration*”. Currently: Associate Director, Medical Affairs Operations, Astellas Pharma, Chicago, IL

#### Sabbatical visitors:

**Prof. Vera Krymskaya** (10/16-1/17), Professor of Medicine, Univ. Pennsylvania

**Prof. Kartiki Desai** (10/16-12.16), Assoc. Professor, Natl. Inst. Biomedical Genomics, India  
**Prof. Sanjay Kumar** (7/14-12/14), Assoc. Prof. of Bioengineering, Univ. California Berkeley  
**Prof. Jennifer Elisseeff** (3/13-7/13), Professor of Biomedical Engineering, Johns Hopkins Univ.  
**Prof. Jerome Breslin** (July 2012), Assoc. Prof., Tulane University  
**Prof. Mingming Wu** (12/08-7/09,12/10-7/10). Assoc. Professor of Physics, Cornell University  
**Prof. Kenneth Barbee** (9/09-5/10). Professor, Biomedical Engineering, Drexel University

#### Visiting scientists:

**Aaron Mayer** (9/13-7/14). Fulbright fellow  
**Amy Sessions** (9/12-8/13). Fulbright fellow  
**Dr. Renata Meżyk-Kopeć** (2/11-8/11 and 4/12-7/12 and 7/2014-6/2016), visiting Scientist from Jongellian University (Krakow, Poland) as part of a joint Swiss-Polish fellowship  
**Vidya Raghunathan** (9/10-7/11). Fulbright fellow  
**Vanessa Kennedy** (9/10-6/11), Whitaker Fellow  
**Jennifer Munson** (9/09-7/10). Fulbright Fellow during her PhD at Georgia Tech  
**Dr. Tine Karlsen** (9/09-7/10). Norwegian Visiting Fellow (Dept Physiology, University of Bergen)

#### MS students:

**Elodie da Costa**, MS in Bioengineering, University of Lyon (Erasmus exchange), 2015.  
**Petra Aigner**, MS in biology, University of Vienna (Erasmus exchange), 2015.  
**Sylvie Hauert**, MS in Chemical Engineering, EPFL, 2014.  
**Iro Oikononidi**, MS in Bioengineering, EPFL 2012. *“Role of leptins in lymphatic endothelial biology in vitro.”*  
**Sabrina Riedl**, MS in Biology, University of Vienna (Erasmus exchange), 2012. *“The influence of different inflammatory microenvironments on lymphatic endothelial cells in vitro.”*  
**Efthymia Vokali**, MS in Bioengineering, EPFL 2011. *“Elucidating the mechanisms of paclitaxel-loaded nanoparticle-induced immune response”*  
**Marcela Rinçon Ristrepo**, MS in Bioengineering, ETH Zurich 2010. *“Development of a recombinant nanoparticle-based vaccine against hemorrhagic arenaviruses”*  
**Carmen Bonvin**, MS in Bioengineering, EPFL 2009. *“High throughput microfluidic devices for 3D angiogenesis assays”*  
**Alba Jiménez**, MS in Industrial Engineering, Polytechnic University of Catalonia, Spain, 2009. (Erasmus student; thesis work in our lab). Thesis: *“Tumor strategies for metastasis through lymphatics and the escape of immune surveillance”*.  
**Carine Rosa Tsamo Nintedem**, MS in Bioengineering, EPFL 2008. *“Uptake and intracellular trafficking of nanoparticle vaccines by dendritic cells”*  
**Sandeep Rangunathan**: MS in Bioengineering, EPFL 2008. *“Characterization studies of an in-vitro system of the gut-lymphatic interface designed to study the transport of drug delivery systems across the intestine”*.  
**Marie Ballester**: MS in Bioengineering, EPFL 2008. *“Towards a nanoparticle vaccine for tuberculosis”*.  
**Simone Bottan**, MS in Biomedical Engineering, Politecnico di Milano, 2008 (Erasmus student). *“Mass transport models of CCR7 ligands in dynamic microenvironments”*  
**Elena Seminati**, MS in Biomedical Eng, Politecnico di Milano, 2007. *“Computational mass transport models of the interactions between tumors and lymphatics”*  
**Alice Tomei**, MS in Biomedical Engineering, Politecnico di Milano, 2004 (Erasmus student).  
**Sai Krishna (Reddy)**: MS in Biomedical Engineering, Northwestern University, 2004. *“A quantitative model for interstitial convective transport of injected particles”*  
**Thomas Le**: MS in Biomedical Eng, Northwestern Univ. 2004 *“Interplay between biophysical & biochemical factors on mammary tumor-endothelial interactions in vitro”*.

#### Major Invited Talks

6/2017 Gordon Research Conference on Cancer Nanotechnology, Stowe, VT  
6/2017 Lymphatic Forum 2017, Chicago, IL  
6/2017 4th Lymphoid Tissue Meeting, St. Gallen, Switzerland

4/2017 American Transplant Congress, Chicago IL

4/2017 Annual Meeting of the American Association for Cancer Research (AACR), Major Symposium on Biology of Metastasis, Washington DC

12/2016 Am. Society for Cell Biology Doorstep Meeting: Cell Biology of Cancer, San Francisco

10/2016 22<sup>nd</sup> Annual Cancer Symposium, Penn State Hershey Cancer Center, Hershey, PA

10/2016 19<sup>th</sup> International Vascular Biology Meeting, Boston, MA

9/2016 4<sup>th</sup> International Nanomedicine & Drug Delivery Symposium (NanoDDS'16), Baltimore MD

9/2016 9<sup>th</sup> International Kloster Seeon Meeting on Angiogenesis, Kloster Seeon, Germany

2016 Physiology 2016, Dublin, Ireland

2016 AACR Special Conference on Engineering and Physical Sciences in Oncology, Boston, MA

2016 Immune Engineering Symposium, Cambridge, MA

2016 Gordon Research Conference on Lymphatics, Ventura, CA

2016 Midwinter Conference of Immunologists, Pacific Grove, CA

2015 Harvard Conference on Fascia, Acupuncture and Cancer, Cambridge, MA

2015 Chicago Breast and Lymphedema Symposium, Chicago IL

2015 The Third Circulation: Lymphatics as Regulators in Health and Disease Symposium, Bethesda MD

2015 CNIO Frontiers Meeting "Metastasis Initiation: Mechanistic Insight and Therapeutic Opportunities", Madrid, Spain

2015 Max Planck Institute workshop "Grand Challenges on Analyzing and Manipulating the Pathophysiology of Cells on the Nanoscale", Heidelberg, Germany

2015 Immunology 2015, New Orleans, LA

2015 U Chicago Ben May Symposium on Cancer Immunotherapy, Chicago, IL

2015 20<sup>th</sup> Annual International 2015 LAM meeting, Chicago, IL

2015 Sudaath Symposium on Immunobiology and Immunoengineering, Atlanta, GA

2014 Ragon Institute Symposium on Synthetic Vaccines

2014 Goodbye Flat Biology: 3D Models and the Tumour Microenvironment, Berlin, Germany

2014 World Congress of Biomechanics, Boston, MA (Plenary)

2014 International Society for Stem Cell Research Annual Meeting, Vancouver, Canada

2014 Imaging 2020, "Imaging the Immune System", Grand Teton Natl Park, WY

2014 Immunology 2014, special symposium "Lymphatic Function and the Immune Response to Microbial or Viral Infection", Pittsburgh, PA

2014 International Vascular Biology Meeting, Kyoto, Japan

2014 Keystone Symposia on Engineering Cell Fate and Function, Olympic Valley, CA

2014 ISREC Symposium 2014, "Metastatic Colonization: Microenvironments, mechanisms, and therapeutic targeting", Crans-Montana, Switzerland

2013 Joint Meeting of the Swiss Society for Allergology and Immunology and the Swiss Respiratory Society, Bern, Switzerland

2013 5th Intl Conference on Tumor Microenvironment and Angiogenesis, Ascona, Switzerland

2013 Roche - Nature Medicine Immunology Symposium, "Host immunity to cancer and chronic viral infections", Buonas, Switzerland

2013 Annual Meeting of the Japanese Physiological Society (plenary), Fukuoma, Japan

2013 "Bridging the Gap" Workshop, Medical University of Vienna, Austria

2013 AACR Special Conference on Tumor Invasion and Metastasis, San Diego, CA

2012 Workshop "Targeting dendritic cells for immunity and tolerance", Ravello, Italy

2012 International conference "Tumor Ecosystem in Cancer and Progression", Nice, France

2012 Harvard Medical School- Department of Immunology Annual Retreat (Keynote)

2012 NanoBio 2012, Seattle, WA USA (Plenary)

2012 Emerging Biomaterials 2012 (Tae Gwan Park Memorial Symposium), Seoul, Korea

2012 14<sup>th</sup> Int'l Congress on Biorheology, Istanbul (Plenary)

2012 Conference on Mathematical & Experimental Models in Mechanobiology, Oxford, UK

2012 Gordon Research Conference on Lymphatic Biology, Ventura, CA

2011 Am. Assoc. Cancer Research "Complexity in the Tumor Microenvironment"

2011 Euromech Colloquium: Biomedical flows at low Reynolds numbers, Zurich (keynote)

2011 Pezcoller Symposium "Engineering in Cancer Research", Trento, Italy

2011 Gordon Research Conference on Mammary Gland Biology, Newport RI, USA

2011 DFG (German Cancer Society) Annual Meeting, Lake Como, Italy  
 2011 Am. Assoc. Cancer Research (AACR) Annual Meeting, “Major symposium” speaker  
 2011 World Immune Regulation Meeting V, Davos Switzerland  
 2011 Chicago Bioengineering Consortium Annual Meeting (plenary), Chicago USA  
 2010 Am. Inst Chemical Engineers (AIChE) Annual meeting (plenary talk), Salt Lake City  
 2010 4<sup>th</sup> Int’l Conf on Tumor-Host Interactions and Angiogenesis, Ascona, Switzerland  
 2010 61<sup>st</sup> National Congress of the Italian Physiological Society (plenary), Varese Italy  
 2010 Gordon Research Conference on Lymphatic Biology, Il Ciocco, Italy  
 2010 EPFL Life Sciences Symposium, Lausanne Switzerland (plenary)  
 2010 Am. Assoc. Cancer Res. Annual Meeting “Meet the Experts” Session, Washington DC  
 2010 Cancer Forum, Arizona State University (NCI-funded workshop)  
 2010 International Conference on Bioengineering and Nanotechnology, Singapore (plenary)  
 2010 3rd International workshop on "Cell communication in health and disease", Vienna  
 2009 Joint meeting of the Swiss & German Societies of Microcirculation, Berne  
 2009 DFG/VWFB International Symposium “The tumor - vessel interface: Cellular and molecular mechanisms of tumor progression and metastasis”, Kloster Seeon, Germany  
 2009 Gordon Research Conference on Collagens, New Hampshire  
 2009 Vanderbilt-Ingram Spring Cancer Center Retreat, Nashville TN  
 2009 Annual Meeting of the N. Am. Vascular Biology Org (NAVBO), New Orleans  
 2009 Keystone Symposium on Mechanotransduction in Physiology and Disease, Taos, NM  
 2008 Annual Meeting of the USGEB, Lausanne  
 2008 Workshop on Computational Systems Immunology, Duke Univ., Durham, NC  
 2008 Am. Assoc. Immunologists “Major Symposium Talk”, Annual Meeting of Experimental Biology, San Diego CA  
 2008 Gordon Research Conference Molecular Mechanisms in Lymphatic Function & Disease, Ventura, CA  
 2008 Gordon Research Conference in Biointerface Science, Aussois, France  
 2008 ISREC Conference on Cancer and the Cell Cycle, Lausanne (plenary)  
 2008 Metastasis Research Society / American Association for Cancer Research Special Conference on Metastasis, Vancouver  
 2008 NCI Workshop “Bridging the gap from molecules to cell behavior in cancer: new technologies and models”, Seattle, WA  
 2007 Gordon Research Conference on Angiogenesis, Newport, RI  
 2007 ELSO, Satellite symposium on the Mechanisms of Cell Migration, Dresden, Germany  
 2007 TERMIS REGENERATE Symposium on Regenerative Medicine and Cancer, Toronto  
 2007 ECI Conference on Engineering Cell Biology: The Cell in Context, Boston  
 2007 AACR-NCI-EORTC International Conference on “Molecular Targets and Cancer Therapeutics: Discovery, Biology, and Clinical Applications”, San Francisco  
 2007 FRAME workshop on In Vitro Models of Inhalation Toxicity, Cambridge, UK  
 2006 Cardiovascular Systems Dynamics Society (keynote), Masstricht, Netherlands  
 2006 Gordon Research Conference in Molecular Mechanisms in Lymphatic Function & Disease, Les Diablerets, Switzerland  
 2006 European Conference for Microcirculation, Amsterdam  
 2006 Subtle Technologies Symposium, Toronto, Canada  
 2006 “Molecular basis of structural and functional barriers in the skin”, Cologne, Germany  
 2005 Am Soc Cell Biology Symposium on “Signaling in 3D Environments”, San Francisco  
 2004 National Meeting of the Am Society of Matrix Biology, San Diego, CA  
 2004 European Society of Biomechanics, s’Hertogenbosch, The Netherlands  
 2004 Gordon Research Conference on Signal Transduction by Engineered Extracellular Matrices, Lewistown, Maine  
 2004 Swiss Society of Microcirculation, Zurich  
 2004 Swiss Society of Biomechanics, Zurich  
 2003 International Congress of Lymphology, Freiburg, Germany  
 2003 Gordon Research Conference in Tissue Repair and Regeneration, Il Ciocco, Italy  
 2003 National Science Foundation workshop in Computation in Biology, Salt Lake City

- 2003 Annual British Microcirculation Meeting, Bristol, England
- 2002 Biocomplexity Workshop, South Bend, Indiana
- 2002 Annual Meeting of the European Society for Microcirculation, Exeter, England
- 2002 NIH think-tank workshop “The Lymphatic Continuum”, Bethesda MD
- 2001 Rita Schaffer Award Lecture, Biomedical Engineering Society Annual Meeting

**Invited Seminars**

- 2017 Univ California San Francisco, Department of Immunology Seminar Series
- 2017 Immunology and Infectious Disease Seminar Series, Genentech, South San Francisco CA
- 2017 University of Washington, Department of Bioengineering, Seattle WA
- 2017 Stanford University, Bio-X Frontiers in Interdisciplinary Biosciences Seminar Series
- 2017 Johns Hopkins University, Dept. Biomedical Engineering Distinguished Lecture Series
- 2016 Cornell Weill Cancer Center, New York, NY
- 2016 University of Michigan, Department of Biomedical Engineering, Ann Arbor MI
- 2016 Washington University St. Louis, Department of Immunology, St. Louis, MO
- 2016 University of Texas, Austin, Department of Biomedical Engineering, Austin TX
- 2016 Immunology and Infectious Disease Seminar Series, Genentech, So. San Francisco, CA
- 2016 University of California, San Francisco, Immunology Seminar Series, San Francisco CA
- 2015 Trudeau Institute, Saranac Lake, NY
- 2015 Cornell University, Department of Biomedical Engineering, Ithaca, NY
- 2015 Malmo Cancer Center, Malmo, Sweden
- 2015 University of Texas Southwestern Medical Center, Simmons Cancer Center
- 2015 University of Wisconsin-Madison, Department of Biomedical Engineering
- 2015 Illinois Institute of Technology, Department of Biomedical Engineering
- 2015 Northwestern University, Feinberg School of Medicine, Vascular Biology Seminar Series
- 2014 Dana-Farber Cancer Institute “Seminars in Oncology Lecture Series”, Boston, MA
- 2014 Freshman Convocation Keynote Address, University of Alaska, Anchorage
- 2014 University of Granada Center for Genomics and Oncological Research, Granada, Spain
- 2013 Britton Chance Lecture, University of Pennsylvania
- 2013 Department of Immunology Seminar, Oxford University, UK
- 2013 Distinguished Lecture Series, Kitasato University School of Medicine, Japan
- 2012 Departmental Seminar, Thoracic Oncology, University of Basel, Switzerland
- 2012 Distinguished Lecture Series, Koch Inst for Cancer Research, MIT, Cambridge MA
- 2012 Seminar series “Biology and Integrative Genomics”, University of Lausanne
- 2011 Diabetes Research Institute, University of Miami, Miami FL USA
- 2011 Cancer Research UK London Research Institute
- 2011 Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Vienna
- 2010 Pasteur Institute, Department of Immunology
- 2010 University Hospital of Vaud (CHUV), Department of Oncology
- 2010 Massachusetts Institute of Technology, Department of Biological Engineering
- 2010 ETH Zurich, Seminar Series "Cutting Edge Topics in Immunology"
- 2010 University of Lausanne, Transbugnon Translational Seminar
- 2010 University of California, San Francisco, Physical Sciences and Oncology Group
- 2010 Stanford University, Department of Bioengineering
- 2010 Istituto Clinico Humanitas, Milan, Italy
- 2010 University of Heidelberg, National Center for Tumor Diseases
- 2010 Friedrich Miescher Institute for Biomedical Research, University of Basel
- 2009 GIGA Research Centre, Université de Liège, Belgium
- 2009 Hoffman-LaRoche AG, Basel, Switzerland
- 2009 Princeton University, Dept Chemical Engineering
- 2009 Mt Sinai School of Medicine, Dept Immunology
- 2007 University of Texas, Austin, Department of Biomedical Engineering
- 2007 University of Geneva School of Medicine, “Frontiers in Biology”
- 2006 University of Virginia, Department of Biomedical Engineering
- 2006 University of Bergen, Department of Physiology



2006 Center for Integrative Genomics, University of Lausanne  
 2005 Stanford University Medical Center, Division of Medicine  
 2005 Department of Pathology, University of Lausanne  
 2005 Swiss Institute for Experimental Cancer Research (ISREC)  
 2005 Mt. Sinai Medical School, Center for Gene Therapy  
 2005 University of Berne, Institute of Anatomy  
 2004 University of Zurich, Research Division of Gynecology  
 2003 University of Kansas, Department of Anatomy and Cell Biology  
 2003 University of Geneva Medical Center, Department of Cell Biology  
 2003 Yale University, Department of Biomedical Engineering  
 2003 University of Illinois Chicago, Department of Pharmacology  
 2003 Johns Hopkins University, Department of Chemical Engineering  
 2003 Duke University, Department of Biomedical Engineering  
 2003 Maine Medical Center, Department of Cell Biology  
 2002 Texas A&M University, Department of Physiology  
 2002 University of Michigan Ann Arbor, Department of Biomedical Engineering  
 2001 University of Illinois Chicago, Department of Biomedical Engineering  
 1998 University of California at San Diego, Department of Biomedical Engineering  
 1998 Northwestern University, Department of Biomedical Engineering  
 1998 Pennsylvania State University, Department of Biomedical Engineering  
 1998 Notre Dame University, Department of Chemical Engineering  
 1998 Ohio State University, Department of Chemical Engineering

### **Sponsored Research – Extramural**

#### **Current**

**2014-16:** Principal Investigator, “Roles of lymphatic drainage function in modulating adaptive immunity”, Swiss National Science Foundation (31003A\_153471)  
**2014-16:** Principal Investigator, “Targeting tumor-associated lymphatics for cancer immunotherapy”, Swiss Cancer League (KFS 3312-08-2013)  
**2013-18:** *Principal Investigator*, “Flow in the tumor microenvironment: Linking mechanobiology with immunology”, European Research Council (AdG – 323053)  
**2013-16:** *Co-investigator (Hanahan, PI)*, “Co-clinical trials multi-targeting oncogenic drivers, angiogenesis, and the tumor-promoting lymphatic microenvironment in melanoma,” Swiss TransMed  
**2012-15:** *Principal Investigator (with Stefan Kunz, co-PI)*, “Immunoengineering a synthetic vaccine against emerging human pathogenic viruses”, Swiss National Science Foundation (CR2312\_143754)

#### **Completed:**

**2011-14:** *Principal Investigator* “Roles of lymphatic endothelium in immunomodulation”, Swiss National Science Foundation (31-135756), SFr 586,578 *Note: This grant was awarded a “Bonus of Excellence” for being in top percentage*  
**2011-14:** *Principal Investigator* “Roles of tumor CCL21 and VEGF-C in immunological tolerance”, Swiss Cancer League (2696-08-2010); SFr 350,000  
**2011-14:** *Co-PI (joint with Stephanie Hugues)*, “Role of tumor lymphangiogenesis in immunological tolerance”, Leenaards Foundation; funds to Swartz lab: SFr 366,375  
**2009-13:** *Principal Investigator (Dual with Gwen Randolph)* “Cholesterol and the lymphatic transport of molecules and cells”, NIH-NHLBI (RO1 HL096539), US\$1,000,000.  
**2008-13:** *PI* “DC-LYMPH: The role of lymphatic vessels in dendritic cell homing and maturation”, European Research Council (206653-2) €1,740,000  
**2008-12:** *Co-Investigator* “AngioScaff: Angiogenesis-inducing Bioactive and Bioresponsive Scaffolds in Tissue Engineering”, European Framework Project 7 (FP7-NMP-2007-LARGE); funds to Swartz lab: €391,600 / 4 years  
**2009-12:** *Project leader*, Swiss National Centre for Competence in Research Molecular Oncology, Swiss National Science Foundation; funds to Swartz lab: SFr 300,000

- 2009-11** *Co-Investigator* “Development of a novel recombinant Lassa vaccine using a nanoparticle platform”, Swiss Vaccine Research Institute, SFr 150,000
- 2008-11:** *Principal Investigator* “Mechanisms of tumor cell entry and trafficking in lymphatic vessels and lymph nodes”, Swiss Natl Science Fndn (310010) SFr 479,000
- 2008-11:** *Principal Investigator* “Roles of CCR7 and VEGF-C in lymphatic metastasis of breast and skin cancers”, Swiss Cancer League (02114-08-2007); SFr 311,100
- 2009-10** *Principal Investigator* “Nanoparticle cancer vaccines targeting surviving”, Merck-Serono, SFr 250,000
- 2009-10** *Principal Investigator* “Lymph Node-Targeting Nanoparticle Vaccine for Breast Cancer”, U.S. DoD Breast Cancer Research Program, US\$75,000
- 2009-10** *Principal Investigator* “Nanoparticle platform for TB vaccine targeting lymph nodes”, Bill and Melinda Gates Foundation (Grand Challenges Explorations), US\$100,000
- 2008-10:** *Principal Investigator* “Synergistic Roles of the Biophysical and Cellular Microenvironments in Breast Cancer Invasion and Metastasis”, Susan G. Komen Fndn US\$150,000
- 2007-8:** *Principal Investigator* “Tumor Cell Homing into the Lymphatics via Autologous Chemokine Signaling and Interstitial Flow”, Novartis Foundation
- 2006-10:** *Co-Investigator* “Immunofunctional nanoparticles”, Competence Center in Materials Science (CCMX), ETH; SFr 300,000
- 2005-8:** *P.I.* “Cooperative Roles of Interstitial Flow and VEGF-C in Adult Lymphangiogenesis: Characterization and Mechanisms”, Swiss National Science Foundation, CHF
- 2003-7:** *Principal Investigator* “Lymph vs. blood angiogenesis: functional differences in vivo and in vitro”, NIH/NHLBI R01 HL075217-01
- 2002-7** *Principal Investigator* “Career: Effects of Interstitial Flow on Extracellular Matrix Architecture”, National Science Foundation
- 2005-6:** *Principal Investigator* “An In Vitro Study of Breast Cancer Invasion into the Lymphatics”, Department of Defense Concept Award
- 2003-4** *Principal Investigator* “Expression of VEGFR-3 by Mammary Epithelium and its Role in Lymphatic Metastasis”, Avon Foundation
- 2002-5** *Principal Investigator* “*In Vitro* Formation of a Functional Capillary Bed”, Arnold and Mabel Beckman Foundation
- 2002-3** *Career Development Award* “Targeted Delivery of Anticancer Drugs to the Lymph Nodes” NIH (part of Breast Cancer SPORE (C. Jordan, PI))
- 2001-2** *Principal Investigator* “Biomechanics of the Cell Cytoskeleton in a 3-D Environment”, Northwestern University / Institute for Biology and Nanoscience in Medicine seed grant
- 2001-4** *Principal Investigator* “The Role of Interstitial Fluid Flow on Lymphangiogenesis”, Whitaker Foundation
- 2001-2** *Principal Investigator* “An Experimental Model for Lymphangiogenesis and Lymphatic Metastasis”, Department of Defense Concept Award in Breast Cancer Research
- 2000/2** *Principal Investigator* “The Development of a Novel *In Vivo* Model for Lymphangiogenesis”, American Cancer Society, Illinois Division

**University Service: University of Chicago**

Institute of Molecular Engineering (IME) Faculty search committee, 2014-  
 IME undergraduate curriculum committee, 2014-  
 University Committee on Campus Planning, 2015-  
 Committee on Immunology, 2014-  
 Committee on Cancer Biology, 2014-

**University Service: EPFL**

Director, Institute of Bioengineering, 2012-2014  
 Founder and Director, Doctoral School in Biotechnology & Bioengineering, 2004-present  
 School of Life Sciences “Direction de Faculté” (Council), 2010-2014  
 School of Life Sciences Promotion & Tenure Committee, 2011-14  
 Organizer of Research Day 2006  
 WISH Foundation, *Friends of the WISH*, Treasurer (2008-2012) and President (2012-)

Steering committee, flow cytometry core facility (presiding member) 2008-present  
Organizer, departmental seminar series, 2004-2006  
Faculty search committee, Institute of Chemistry and Chemical Engineering, 2004-present  
Faculty search committee, Institute of Bioengineering, 2004-present  
Faculty search committee, CIME (Electron Microscopy Center) director, 2006  
Faculty search committee, Swiss Institute for Cancer Research (ISREC), 2007-8; 2009-pres.  
Faculty search committee, Global Health Institute, 2008  
Faculty search committee, Center for Integrative Genomics, UNIL, 2006  
Discussion leader, Journée Scientifique et Pédagogic, 2006 and 2008

**University Service: Northwestern**

Organizer, Engineering Education Workshop for New Faculty (w/ Lonnie Shea), 9/00, 1/02  
Organizer for annual Nonlinear Workshop (U. Chicago and Northwestern), 2001  
Faculty search committee, Biomedical Engineering Department, 1999-2002  
Graduate recruiting committee, Biomedical Engineering Department, 2000-2004  
Long-range planning committee, Biomedical Engineering Department, 2000-2004  
Steering committee, NIH Biotechnology Training Grant, 1999-2004  
Undergraduate program committee, Biomedical Engineering Department, 2000-2004  
Undergraduate program committee, Chemical Engineering Department, 2000-2004  
Steering committee, Nanobiomechanics Seminar Series (Interdisciplinary), 2000-1  
Organizer, Nanobiomechanics Seminar Series, 2001-3  
Organizer, Biomedical Engineering Departmental Seminar Series, 2001-3  
Faculty advisor, IGERT (NSF) program for Dynamics in Complex Systems, 1999-2004  
Faculty preceptor, Interdisciplinary Biological Sciences Program, 1999-2004