

# Mark A. LaBarge, Ph.D

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## Research and Other Professional Experience

- 1993-1996 University of California, Davis. B.S., Genetics  
Research: Biological control and molecular taxonomy of *Rhizomonas suberifaciens*  
Mentor: Dr. Ariena Van Bruggen
- 1995 Summer Intern, Research and Development Department, Genentech, S.San Francisco, CA  
Research: Sialidase assay development  
Mentor: Dr. Lynn Krummen
- 1996-1999 Research Assistant, Department of Molecular Pharmacology, Stanford University  
Research: cDNA library screens, cell-specific targeting of retroviral envelope proteins  
Mentor: Dr. Garry P. Nolan
- 1999-2004 Graduate Student, Stanford University. Ph.D. in Molecular Pharmacology  
Research: Mechanisms of bone marrow cell-derived myogenesis, muscle stem cell biology.  
Mentor: Dr. Helen M. Blau
- 2000-2004 Consultant on PANTHER project, Celera Genomics, Foster City, CA
- 2004-2009 Postdoctoral Fellow, Lawrence Berkeley National Laboratory, Cancer Biology  
Research: Microenvironment-directed fate decisions and signal integration in adult stem cells of the mammary gland Mentor: Dr. Mina J Bissell
- 2007-2010 Consultant for Rigel Pharmaceuticals, South San Francisco, CA
- 2009-2013 Staff Scientist career track (~Assist Prof ), Life Science Division, LBNL
- 2013-pres Career Staff Scientist, Life Science Division, Lawrence Berkeley National Laboratory
- 2013-pres Principal Investigator, UC Berkeley Stem Cell Center, Berkeley, CA
- 2014-pres Nodexus, scientific advisory board
- 2014-2015 Program Leader, Human Tissue and Microenvironment Biology, LBNL Life Science Division
- 2015-pres Interim Deputy Director of the Biological Systems and Engineering Division, LBNL
- 2015-pres Chairman, Department of Organismal Systems and Bioresilience, LBNL BSE Division

## Current Funding

- 1) R01 NIA, R01AG040081 (2011-2016)
- 2) Era of Hope Scholar Award, BC141351. CDMRP Breast Cancer Research Program (2015-2020)
- 3) California Breast Cancer Research Program IDEA award (2015-2016)
- 4) NHGRI, Library of Integrated Network-based Cellular Signatures (LINCS) (PI: J.Gray) (2014-2019)

## Completed Funding

- 1) US Department of Energy Low Dose Radiation program, (PI: Karpen)
- 2) Laboratory Directed Research and Development, US Department of Energy contract# DE-AC02-05CH11231
- 3) K99/R00 National Institute on Aging, R00AG033176
- 4) NCI Physical Sciences in Oncology Center, UCSF/UCB Pilot Project and Transnetwork Initiative
- 5) American Cancer Society Postdoctoral Fellowship

## Honors, Awards, and Courses

- 2003 Keystone Scholarship, "From Stem Cells to Therapy", Steamboat Springs, Colorado
- 2005 American Cancer Society Postdoctoral Fellowship (accepted, 2006-2008, ranking 1 out of 19)
- 2005 National Cancer Institute's National Research Service Award (awarded, not accepted, ranking 9 out of 376)
- 2008 "Future Leaders, New Directions", American Association for Cancer Research.
- 2008 LBNL SPOT Recognition Award for outstanding contributions on an LBNL project
- 2009 K99/R00 Pathway to Independence Award, National Institute on Aging, NIH
- 2009 NIA Summer Course on Experimental Aging Research, The Buck Institute for Age Research, CA
- 2010 LBNL Leadership Development Program
- 2012 Representative for LBNL Life Sciences to U.S. House and Senate at "UC Day in DC"
- 2012 "Future Leaders, New Directions in Aging Research", Gerontological Society of America
- 2015 LBNL SPOT Recognition Award for designing and launching Biosciences Mentoring Program
- 2015 Era of Hope Scholar Award, CDMRP Breast Cancer Research Program

2015 Inducted into the Quartz Hill High School Hall of Fame for achievements in science, October 2

### Professional and Community Service

2000-2001 Student representative, Committee on Graduate Admissions and Policy, Stanford University  
2009-2013 NCI Investigational new drug task force for cancer stem cell therapeutics  
2011-2013 LBNL Life Science Division Recognition Committee  
2011 LBNL Life Science Division Director search committee.  
2011-2013 LBNL Life Science Division Advisory Committee, *ad hoc* member  
2012 LBNL Biosciences Strategic Planning Committee  
2012 LBNL Life Science Division Deputy Director of Operations search committee  
2010-pres Grant reviewer for NSF, European Research Council, Human Frontiers, Breast Cancer Campaign UK, and other international organizations.  
2012-pres Scientist boots on the ground, Glorietta Elementary, Orinda, CA  
2013-pres NIH study sections: NCI special emphasis (ER+ breast cancers) ZCA1 GRB-I (J1), provocative questions ZCA SRLB-U (J1), ZCA1-GRB-P (A1), and Breast Cancer Consortium ZES1-SET K BC.  
2013 Biosciences area strategic plan development team, LBNL  
2014, 15 Mentor/coach, Odyssey of the Mind, Glorietta Elementary, Orinda, CA  
2014-2015 LBNL Life Science Division Scientific Advisory Committee member  
2014 LBNL Biosciences mentoring program – launch team  
2014-pres LBNL Biosciences Strategic Plan implementation lead  
2015 CDMRP Breast Cancer Research Program study section  
2015 Co-leader for LBNL Biosciences area-wide reorganization, Biological Systems and Engineering Division

### Journal Publications (ordered from most recent to earliest)

1. LaBarge MA, Mora-Blanco EL, Samson S, Miyano M. Breast cancer beyond the age of mutation. *Gerontology* (2015), in press.
2. Lin CH, Pelissier FA, Zhang H, Lakins J, Weaver VM, Park C, and LaBarge MA. Microenvironment rigidity modulates responses to HER2 receptor tyrosine kinase inhibitor lapatinib via YAP and TAZ transcription factors. *Molecular Biology of the Cell* (2015) Sept 2, In press
3. Todhunter M, Jee N, Coyle M, Cerchiari A, Farlow J, Garbe JC, LaBarge MA, Desai T, and Gartner ZJ. Programmed synthesis of 3D tissues. *Nature Methods* (2015) Aug 31. In press
4. Lee JK, Garbe JC, Vrba L, Miyano M, Futscher BW, Stampfer MR, and LaBarge MA. Age and the means of bypassing stasis influence the intrinsic subtype of immortalized human mammary epithelial cells. *Frontiers in Cell and Developmental Biology* (2015), Mar 11;3:13
5. Cerchiari A, Garbe JC, Jee N, Todhunter M, Peehl D, Desai T, LaBarge MA, Thomson M, and Gartner ZJ. A strategy for tissue self-organization that is robust to cellular heterogeneity and plasticity. *PNAS* (2015) Jan 29
6. Cerchiari A, Garbe JC, Todhunter M, Jee N, Pinney J, LaBarge MA, Desai T, and Gartner ZJ. Formation of spatially and geometrically controlled 3D tissues in soft gels by Sacrificial Micromolding. *Tissue Eng Part C Methods*. (2014) Oct 29.
7. Garbe JC, Vrba L, Sputova K, Fuchs L, Novak P, Brothman AR, Jackson M, Chin K, LaBarge MA, Watts G, Futscher BW, and Stampfer MR. Immortalization of Normal Human Mammary Epithelial Cells in Two Steps by Direct Targeting of Senescence Barriers Does Not Require Gross Genomic Alterations. *Cell Cycle*. (2014) Nov 1;13(21):3423-35.
8. Pelissier FA, Garbe JC, Ananthanarayanan B, Miyano M, Lin CH, Jokela T, Kumar S, Stampfer R, Lorens JB, and LaBarge MA. Age-related dysfunction of mechano-transduction impairs differentiation of human mammary epithelial progenitors. *Cell Reports* (2014), June 26
9. LaBarge MA, Parvin B, Lorens JB. Molecular deconstruction, detection, and computational prediction of microenvironment-modulated cellular responses to cancer therapeutics. *Adv Drug Deliv Rev*. (2014) Feb 26.
10. Wang Y, Wen M, Kwon Y, Xu Y, Liu Y, Zhang P, Wang Q, Huang Y, Jen KY, LaBarge MA, You L, Kogan SC, Gray JW, Mao JH, and Wei G. CUL4A induces epithelial-to-mesenchymal transition and promotes cancer metastasis by regulating ZEB1 expression. *Cancer Research* (2014) Jan 15;74(2):520-31.
11. LaBarge MA. Breaking the canon: indirect regulation of Wnt signaling in mammary stem cells by MMP3. *Cell Stem Cell* (2013) September 5; 13(3) 259-260.
12. Sputova K, Garbe JC, Pelissier FA, Chang E, Stampfer MR, and LaBarge MA. Aging phenotypes in cultured normal human mammary epithelial cells are correlated with decreased telomerase activity independent of telomere length. *Genome Integrity* (2013) May 29;4(1):4
13. LaBarge MA, Garbe JC, and Stampfer MR. Processing of human reduction mammoplasty and mastectomy tissues for cell culture. *Journal of Visualized Experimentation* (2013). Jan 3;(71)

14. Liu JSE, Farlow J, LaBarge MA, and Gartner ZJ. Programmed cell-to-cell variability in Ras activity triggers emergent behaviors during mammary epithelial morphogenesis. *Cell Reports* (2012). Oct 3 (68).
15. Garbe JC, Pepin F, Pelissier FA, Fridriksdottir A, Sputova K, Guo DE, Villadsen R, Park M, Petersen OW, Barowsky A, Stampfer MR, and LaBarge MA<sup>#</sup>. Accumulation of multipotent progenitors with a basal differentiation bias during aging of human mammary epithelia. *Cancer Research* (2012). Jul 15;72(14):3687-3701. Epub 2012 May 2. (Included in "Cell Biology 2012" press book as one of 2012's Most Novel and Newsworthy Top 10 Picks at the 52<sup>nd</sup> ASCB Annual Meeting.)
16. Lin CH, Lee J, and LaBarge MA<sup>#</sup>. Fabrication and use of MicroEnvironment microArrays. *Journal of Visualized Experimentation* (2012). Oct 11 [epub and video online]
17. LaBarge MA<sup>#</sup>. On stem cells in the human breast. *Cold Spring Harb Perspect Biol.* (2012) May 1;4(5). PMID: 22550235
18. Chanson L\*, Brownfield D\*, Garbe, JC, Kuhn I, Stampfer MR, Bissell MJ, and LaBarge MA<sup>#</sup>. Self-organization is a dynamic and lineage-intrinsic property of mammary epithelial cells. *PNAS* (2011), 108(8)3264-9. PMID: PMC3044373
19. LaBarge MA<sup>#</sup>. The difficulty of targeting cancer stem cell niches. (2010) *Clinical Cancer Research*. June 15;16(12):3121-9
20. LaBarge MA<sup>#</sup>, Nelson CM, Villadsen R, Fridriksdottir A, Ruth JR, Stampfer MM, Petersen OW, and Bissell MJ. Human mammary progenitor cell fate decisions are products of interactions with combinatorial microenvironments. (2009) *Integrative Biology*. January 1(1):70-79.
21. LaBarge MA<sup>#</sup> and Bissell MJ (2008). Is CD133 a marker of colon cancer stem cells? *The Journal of Clinical Investigation*. Jun;118(6):2021-4.
22. Radisky D\* and LaBarge MA<sup>#\*</sup> (2008). Epithelial-Mesenchymal Transition and the Stem Cell Phenotype. *Cell Stem Cell*. Jun 5;2(6):511-2
23. LaBarge MA<sup>#</sup>, Petersen OW, and Bissell MJ. (2007). Of Microenvironments and Mammary Stem Cells. *Stem Cell Reviews*. 2007 Jun;3(2):137-46.
24. Villadsen R, Fridriksdottir AJ, Gudjonsson T, Rank F, Rønnov-Jessen L, LaBarge MA, Bissell MJ, and Petersen OW (2007). Evidence for a stem cell hierarchy in the adult human mammary gland. *Journal of Cell Biology*, Apr 9;177(1):87-101
25. Sacco A, Doyonnas R, LaBarge MA, Hammer MM, Kraft P, and Blau HM (2005). IGF-I Increases Bone Marrow Contribution to Adult Skeletal Muscle and Enhances the Fusion of Myelomonocytic Precursors. *Journal of Cell Biology*, Nov 7;171(3):483-92.
26. Bissell MJ, LaBarge MA. (2005). Context, tissue plasticity, and cancer: are tumor stem cells also regulated by the microenvironment? *Cancer Cell*, January; 7(1):17-23.
27. Palermo AT\*, LaBarge MA\*, Doyonnas R, Pomerantz J, Blau HM. (2005). Bone marrow contribution to skeletal muscle: A physiological response to stress. *Developmental Biology*. March 15; 279(2):336-44
28. Doyonnas R, LaBarge MA, Sacco A, Charlton C, Blau HM. (2004). Myelomonocytic precursors, not mature macrophages, contribute to skeletal muscle regeneration.(2004) *PNAS*, Sept 14; 101(37):13507-12
29. LaBarge MA, Blau HM. (2002). Biological progression from adult bone marrow to mononucleate muscle stem cell to multinucleate muscle fiber in response to injury. *Cell*, Nov 15;111(4):589-601
30. Hitoshi Y, Lorens J, Kitada SI, Fisher J, LaBarge M, Ring HZ, Francke U, Reed JC, Kinoshita S, Nolan GP. (1998). Toso, a cell surface, specific regulator of Fas-induced apoptosis in T cells. *Immunity* Apr;8(4):461-71

\*: Indicates equal authorship #: Indicates corresponding author

### Chapters in Books

- B1. Culture of mammary stem cells. Mark A LaBarge (2015). Culture of human stem cells. John Wiley & Sons, Hoboken, NJ
- B2. An Integrated Human Mammary Epithelial Cell Culture System for Studying Carcinogenesis and Aging. James C Garbe, Mark A LaBarge, and Martha R Stampfer Cell and Molecular Biology of Breast Cancer. Springer Publishing. (2013)
- B3. The tumor microenvironment as a transient niche: A modulator of epigenetic states and stem cell functions. E.Lorena Mora-Blanco, James B Lorens, and Mark A LaBarge. Trends in stem cell differentiation and cancer research. Springer Publishing. (2013)
- B4. Culture of mammary stem cells. Mark A LaBarge, Ole W Petersen, and Mina J Bissell (2007). Culture of human stem cells. John Wiley & Sons, Hoboken, NJ.
- B5. Skeletal Muscle Stem Cells. Mark A. LaBarge and Helen M. Blau. (2004). Handbook of Adult and Fetal Stem Cells. Elsevier Science Press.
- B6. Skeletal Muscle Stem Cells. Mark A. LaBarge and Helen M Blau. (2004). Essentials of Stem Cell Biology. Elsevier Science Press.

### **Manuscripts in review (not yet in press and not in preparation)**

1. C Tiron, FA Pelissier, K Wnuk-Lipinska, I Stefansson, R Virtakoivu, M Miyano, E Mattila, V Fey, T Sandal, D Micklem, JC Garbe, MR Stampfer, J Ivaska, LA Akslen, MA LaBarge\*, JB Lorens\*. Axl receptor is a functional marker of human and mouse mammary stem cells required for maintaining the stem cell phenotype.
2. Ertsas H, LaBarge MA\*, and Lorens JB\*. Microenvironment-controlled growth factor signaling is attenuated with age

### **Patents**

1. US2013324439-A1; Fabrication and use of MicroEnvironment microarrays (MEArrays)
2. US2013203069-A1; Dynamic assay for maintenance and disruption of tissue level organization and architecture.

### **Editorial Boards (current)**

Frontiers in Cell and Developmental Biology (Associate editor)  
Journal of Breast Cancer Survival

### **Speaking Invitations**

- 2015 UC Berkeley Department of Bioengineering, Berkeley, CA
- 2015 UCSF Breast Oncology Program, San Francisco, CA
- 2015 UCSF Helen Diller Comprehensive Cancer Center, San Francisco, CA
- 2015 Susan Love Research Foundation's International Symposium of the Breast. Santa Monica, CA
- 2015 Stem Cell Online Conference, Target Meeting
- 2014 Department of Cellular and Structural Biology, University of Texas San Antonio, TX
- 2014 UC Berkeley Stem Cell Center, Monterey, CA
- 2014 Life Science Division Seminar Series, Lawrence Berkeley National Lab, Berkeley, CA
- 2014 Center for Cancer Biomarkers (CCBIO), University of Bergen, Bergen, Norway
- 2014 National Breast Cancer Coalition, Artemis Project meeting, Napa, CA
- 2013 OHSU Dept of Cell and Developmental Biology, Portland, OR
- 2013 Stem Cells and Aging Symposium, UC Santa Cruz, Santa Cruz, CA
- 2013 Medical School Seminar Series, University of Arizona, Tucson, AZ
- 2012 University of Oregon Health Sciences Bioengineering Seminar Series, Portland, OR
- 2012 3rd Predictive In Vitro Models Summit, Boston, MA
- 2012 World Stem & Progenitor Cell Online Symposium Series
- 2012 Gerontological Society of America, San Diego, CA
- 2011 Bay Area Breast Oncology Program, UCSF, CA
- 2011 University of California Davis, Department of Pathology; Davis, CA
- 2011 Epigenetics in Clinical Medicine; Nobel Forum, Karolinska Institute; Stockholm, Sweden
- 2011 Regenerative Medicine Seminar Series, Stanford University Medical Center; Palo Alto, CA
- 2011 Mayo Clinic; Jacksonville, FL
- 2010 Annual meeting of the International Society for Stem Cell Research; San Francisco, CA
- 2010 Keynote, Bergen Cancer Center, University of Bergen; Bergen, Norway
- 2009 2<sup>nd</sup> Annual Norwegian Cancer Symposium on Cancer Stem Cells; Oslo, Norway
- 2009 Keynote, Swedish Research Council meeting on "Progenitor cells, Microenvironment and Cell Fusion in Cancer Progression"; Djuronaset, Stockholm, Sweden
- 2009 Boston University, Department of Medicine Hematology/Oncology; Boston, MA
- 2009 University of California, Department of Radiation Oncology; San Francisco, CA
- 2009 Boston University, Department of Biochemistry; Boston, MA
- 2008 NCI Cancer stem cell therapeutics task force meeting; Bethesda, MD
- 2008 American Cancer Society Postdoctoral Fellows Symposium; Asheville, NC
- 2008 American Association for Cancer Research; "Future Leaders, New Directions" symposium; San Diego, CA
- 2007 University of California, Davis; Inaugural Breast Cancer Symposium
- 2007 Rigel Pharmaceuticals; South San Francisco, CA
- 2007 University of California, San Francisco; Breast Oncology Program
- 2007 Radium Hospital; Oslo, Norway
- 2007 Keystone Symposium on Stem Cell Biology; Keystone, CO
- 2006 Federation of Clinical Immunology Society Annual Meeting – Ideashop V; San Francisco, CA
- 2002 Biomedical Research Center, University of British Columbia, Vancouver, Canada
- 2002 The Sixth Joint Meeting of The Japan Society of Histochemistry and Cytochemistry and The Histochemical Society, University of Washington, Seattle, WA

**Teaching Experience**

- 2013-present Lectures (annually) on tumor microenvironments to 1st year Oncology residents at UCSF.
- 2009-present A number of random lectures on stem cell-microenvironment interactions for undergraduate courses, UC Berkeley (e.g. MCB15 and DECAL).
- 2007 Postgraduate course on primary cell culture, Panum Institute, University of Copenhagen, Denmark
- 2001-2002 Teaching Assistant: M & I 231, "Stem cells and gene therapy", Stanford University
- 1996, Spring Teaching Assistant: "Advanced Biochemistry Laboratory", UC Davis

**Society Memberships**

- American Society for Cell Biology
- International Society for Stem Cell Research