Aaron S. Meyer

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Education

Ph.D., Biological Engineering — April 2014
Massachusetts Institute of Technology, Cambridge, MA
Thesis: Quantitative approaches to understanding signaling regulation of 3D cell migration

B.S., Bioengineering, magna cum laude — June 2009
University of California, Los Angeles, CA

Research Experience

Principal Investigator & Research Fellow — September 2014 – Present
Koch Cancer Institute, MIT, Cambridge, MA

- Developing systems cancer cell resistance model allowing predictive precision therapy selection
- Refining models of TAM receptor activation for optimal immunotherapeutic targeting

Postdoctoral Associate in the labs of Forest White & Douglas Lauffenburger — June – September 2014
Department of Biological Engineering & Koch Cancer Institute, MIT, Cambridge, MA

- Performed global phosphotyrosine analysis of TAM receptor transactivation
- Utilized systems analysis to identify receptor localization importance to transactivation effects

Graduate Researcher in the labs of Douglas Lauffenburger & Frank Gertler — 2009 – 2014
Department of Biological Engineering & Koch Cancer Institute, MIT, Cambridge, MA

- Identified similarities in migration response between dimensionalities, suggesting relevant migration assays for invasive disease
- Studied transactivation of TAM receptors and its role in promoting motility response
- Developed systems models of TAM signaling, unifying conflicting observations regarding the receptors in normal biology and suggesting new methods of intervention to modulate activity

Undergraduate Researcher in the lab of Daniel Kamei — 2006 – 2009
Department of Bioengineering, University of California, Los Angeles, CA

- Investigated biomarker purification using novel aqueous micellar systems
- Extended a previous statistical mechanics model to nucleic acid partitioning
- Designed and executed experiments to analyze the partitioning of surfactant systems
- Developed assays for quantifying the concentration of charged and uncharged surfactants

Summer Intern, Bioprocess Development Division — 2008
Schering-Plough Corporation, Watchung, NJ

- Developed a novel method for high-throughput batch culture within deep-welled microtiter plates
- Investigated the social behavior of nonproducing impurities within monoclonal cultures
- Provided statistical basis for process-based confidence in monoclonality

Refereed Publications

Richards, E.J., S. Manole, **A.S. Meyer**. "Engineering more precise and potent TAM-targeted therapies." *In preparation*.

Zweemer, A.J.M., C.B. French, J. Mesfin, S. Gordonov, **A.S. Meyer**[2], D.A. Lauffenburger[2]. "Apoptotic Cell Bodies Elicit Gas6-Mediated Migration Of AXL-Expressing Tumor Cells." *Submitted.*

Archer, T.C., E.J. Fertig, S.J.C. Gosline, M. Hafner, S.K. Hughes, B.A. Joughin, **A.S. Meyer**[1], S.P. Piccolo, A. Shajahan-Haq. "Systems Approaches to Cancer Biology." *Cancer Research.* 2016. *Accepted*.

Manole, S., E.J. Richards, **A.S. Meyer**. "JNK pathway activation modulates acquired resistance to EGFR/HER2 targeted therapies." *Cancer Research.* 2016 Sept 15; 76 (18): 5219-5228.

McConnell, R.E., J.E. Van Veen, M. Vidaki, A.V. Kwiatkowski, **A.S. Meyer**, D.A. Lauffenburger, F.B. Gertler. "A Requirement for Filopodia Extension Towards Slit During Robo-Mediated Axon Repulsion." *Journal of Cell Biology.* 2016 Apr 18; 213 (2): 261.

Miller, M.A., M.J. Oudin, R.J. Sullivan, D.T. Frederick, **A.S. Meyer**, S. Wang, H. Im, J. Tadros, L.G. Griffith, H. Lee, R. Weissleder, K.T. Flaherty, F.B. Gertler, D.A. Lauffenburger. "Reduced proteolytic shedding of receptor tyrosine kinases is a post-translational mechanism of kinase inhibitor resistance." *Cancer Discovery.* 2016 Apr; 6:331-333.

Miller, M.A., M. Moss, G. Powell, R. Petrovich, L. Edwards, **A.S. Meyer**, L.G. Griffith, D.A. Lauffenburger. "Targeting autocrine HB-EGF signaling with specific ADAM12 inhibition using recombinant ADAM12 prodomain." *Scientific Reports.* 2015 Oct 19; 5:15150.

Meyer[2]**, A.S.**, A.J.M. Zweemer, D.A. Lauffenburger[2]. "The AXL receptor is a sensor of ligand spatial heterogeneity." *Cell Systems.* 2015 Nov 29; 1(1):25-36.

Riquelme, D.N., **A.S. Meyer**, M. Barzik, A. Keating, F.B. Gertler. "Selectivity in subunit composition of Ena/VASP tetramers." *Biosci. Rep.* 2015 Jul 28;35(5). pii: e00246.

Meyer, A.S., M.A. Miller, F.B. Gertler, D.A. Lauffenburger. "The receptor AXL diversifies EGFR signaling and limits the response to EGFR-targeted inhibitors in triple-negative breast cancer cells." *Science Signaling.* 2013 Aug 6; 6(287):ra66.

Miller[3], M.A., **A.S. Meyer**[3], M. Beste, Z. Lasisi, S. Reddy, K. Jeng, C.-H. Chen, J. Han, K. Isaacson, L.G. Griffith, D.A. Lauffenburger. "ADAM-10 and -17 regulate endometriotic cell migration via concerted ligand and receptor shedding feedback on kinase signaling." *Proc. Natl. Acad. Sci. U.S.A.* 2013 May 28; 110(22):E2074-83.

Meyer, A.S., S.K. Hughes-Alford, J.E. Kay, A. Castillo, A. Wells, F.B. Gertler, D.A. Lauffenburger. "2D protrusion but not motility predicts growth factor-induced cancer cell migration in 3D collagen." *Journal of Cell Biology.* 2012 Jun 11; 197(6):721-9.

Kim, H.D., **A.S. Meyer**, J.P. Wagner, S.K. Alford, A. Wells, F.B. Gertler, D.A. Lauffenburger. "Signaling network state predicts Twist-mediated effects on breast cell migration across diverse growth factor contexts." *Mol. Cell. Proteomics.* 2011 Nov;10(11):M111.008433.

Meyer, A.S., R.G. Condon, G. Keil, N. Jhaveri, Z. Liu, Y.-S. Tsao. "Fluorinert, an oxygen carrier, improves cell culture performance in deep square 96-well plates by facilitating oxygen transfer." *Biotechnol. Prog.* 2012 Jan; 28(1):171-8.

[1]Corresponding author.
[2]Co-corresponding authors.
[3]Equally contributing authors.

Mashayekhi, F., **A.S. Meyer**, S.A. Shiigi, V. Nguyen, D.T. Kamei. "Concentration of mammalian genomic DNA using two-phase aqueous micellar systems." *Biotechnol. Bioeng.* 2009 Apr 15; 102(6):1613-23.

Research Support & Awards

Fellowship Grant 2017 – 2019
Terri Brodeur Breast Cancer Foundation
"Decoding the Role of TAM Receptors *In Vivo* Using More Specific and Potent Inhibitors"

Ten to Watch, Amgen Scholars Foundation 2016

AMIGOS Program Award 2016 – 2020
Jayne Koskinas Ted Giovanis Foundation and Breast Cancer Research Foundation
"Understanding the Role of Cell Plasticity in Mediating Drug Resistance"

Frontier Research Program Initiator Award 2015
Koch Institute for Integrative Cancer Research
"Multiplexed Tools for Probing Chemokine Receptor Activation State in Breast Cancer"

NIH Director's Early Independence Award 2014 – 2019
DP5-OD019815 – "Adapter-Layer RTK Signaling: Basic Understanding & Targeted Drug Resistance"
Highlighted by the NIH director's office.

Siebel Scholar, Class of 2014 2013

Whitaker Fellowship 2013
Massachusetts Institute of Technology

Repligen Fellowship in Cancer Research 2012
Koch Institute for Integrative Cancer Research

Frontier Research Program Initiator Award 2011
Koch Institute for Integrative Cancer Research
"Global Growth Factor Reprogramming and Invasion By AXL Expression And Shedding In Breast Carcinoma"

Breast Cancer Research Predoctoral Fellowship 2010 – 2014
Department of Defense
W81XWH-11-1-0088 – "Molecular Regulatory Network Dysregulation in Breast Cancer Cell Migration & Invasion"

Graduate Research Fellowship 2009 – 2014
National Science Foundation

Momenta Presidential Fellowship 2009
Massachusetts Institute of Technology

Teaching & Mentoring Experience

Faculty of the Citizen Science Program July 2015 – January 2016
Bard College, Citizen Science Program, Annandale-on-Hudson, NY
- Led a short course introducing students to the natural sciences and scientific method

Undergraduate Mentor 2009 – Present
MIT, Department of Biological Engineering, Cambridge, MA
- Designed and supervised projects for nine undergraduate students

Teaching Assistant, Thermodynamics of Biomolecular Systems 2010
MIT, Department of Biological Engineering, Cambridge, MA
- Taught at weekly discussion sections, office hours, and individual appointments
- Helped write and graded problem sets and exam questions

Conference & Invited Presentations

Momenta Pharmaceuticals, Invited Oral Presentation April 2017
Robinett, R.A., N. Guan, **A.S. Meyer**. "Dissecting FcγR Regulation Through a Multivalent Binding Model."

Univ. of Pennsylvania, Department of Bioengineering, Invited Departmental Speaker March 2017
Meyer, A.S.. "Engineering more precise and potent TAM-targeted therapies."

Univ. of Calif., Los Angeles, Department of Bioengineering, Invited Departmental Speaker March 2017
Meyer, A.S.. "Engineering more precise and potent TAM-targeted therapies."

Biomedical Engineering Society Annual Meeting, Selected Oral Presentation October 2016
Manole, S., E.J. Richards, **A.S. Meyer**. "JNK pathway activation modulates acquired resistance to EGFR/HER2 targeted therapies."

MD Anderson Cancer Center, Dept. of Systems Biology, Invited Departmental Speaker September 2016
Richards, E.J., A. Zweemer, **A.S. Meyer**. "Engineering more precise and potent TAM-targeted therapies."

MD Anderson Cancer Center, Future of Science Symposium, Invited Oral Presentation September 2016
Manole, S., **A.S. Meyer**. "Toward precision therapy: Identifying molecular commonalities among RTK bypass resistance mechanisms."

FASEB Protein Kinase Signaling Network Regulation, Invited Oral Presentation July 2016
Richards, E.J., A. Zweemer, **A.S. Meyer**. "Engineering more precise and potent TAM-targeted therapies."

Univ. of Calif., Irvine, Center for Complex Biological Systems, Invited Departmental Speaker May 2016
Manole, S., E.J. Richards, **A.S. Meyer**. "Data-driven design of targeted therapies and immunotherapies for cancer."

Systems Approaches to Cancer Biology, NCI Invited Oral Presentation April 2016
Manole, S., E.J. Richards, **A.S. Meyer**. "Looking across resistance mechanisms to identify molecular commonalities and precision therapy approaches."

Applied Mathematics in Germinating Oncology Solutions Workshop, NCI Invited Participant March 2016

NIH Common Fund High-Risk High-Reward Symposium December 2015
Manole, S., E.J. Richards, **A.S. Meyer**. "Conserved RTK-intrinsic signaling consequences result in distinct bypass resistance capacity dependent upon pathway dependencies."

Harvard Medical School, Brugge lab, Invited Oral Presentation November 2015
Manole, S., E.J. Richards, **A.S. Meyer**. "Conserved RTK-intrinsic signaling consequences result in distinct bypass resistance capacity dependent upon pathway dependencies."

Biomedical Engineering Society Annual Meeting October 2015
Manole, S., **A.S. Meyer**. "Conserved RTK-intrinsic signaling consequences result in distinct bypass resistance capacity dependent upon pathway dependencies."

ICBP Principal Investigators Meeting May 2015
Manole, S., **A.S. Meyer**. "Conserved RTK-intrinsic signaling consequences result in distinct bypass resistance capacity dependent upon pathway dependencies."

NIH Common Fund High-Risk High-Reward Symposium December 2014
Meyer, A.S.. "Adapter-Layer Integration of RTK Signaling: Basic Understanding and Application to Prediction of Targeted Drug Resistance."

Biomedical Engineering Society Annual Meeting, Selected Oral Presentation October 2014
Meyer, A.S., C.A. Riley, D.A. Lauffenburger. "AXL Is a Spatial Ligand Differentiation Sensor."

Interdisciplinary Signaling Workshop, Selected Oral Presentation July 2014
Meyer, A.S., C.A. Riley, D.A. Lauffenburger. "AXL Is a Spatial Ligand Differentiation Sensor."

ICBP Principal Investigators Meeting May 2014
Meyer, A.S., C.A. Riley, D.A. Lauffenburger. "AXL is a spatial ligand differentiation sensor."

AACR Molecular Targets and Cancer Therapeutics October 2013
Meyer, A.S., F.B. Gertler, D.A. Lauffenburger. "AXL amplifies EGFR signaling and drives resistance in triple negative breast carcinoma cells."

Merrimack Pharmaceuticals, Invited Oral Presentation October 2013
Meyer, A.S., C.A. Riley, D.A. Lauffenburger. "AXL is a spatial ligand differentiation sensor."

ICBP Principal Investigators Meeting May 2013
Meyer, A.S., F.B. Gertler, D.A. Lauffenburger. "AXL amplifies EGFR signaling and drives resistance in triple negative breast carcinoma cells."

Merrimack Pharmaceuticals, Invited Oral Presentation January 2013
Meyer, A.S., F.B. Gertler, D.A. Lauffenburger. "AXL amplifies EGFR signaling and drives resistance in triple negative breast carcinoma cells."

PTMs in Cell Signaling, Copenhagen Bioscience Conferences, Travel Award December 2012
Meyer, A.S., F.B. Gertler, D.A. Lauffenburger. "AXL amplifies EGFR signaling and drives resistance in triple negative breast carcinoma cells."

Biomedical Engineering Society Annual Meeting, Selected Oral Presentation October 2012

Meyer, A.S., S.K. Hughes-Alford, J.E. Kay, A. Castillo, A. Wells, F.B. Gertler, D.A. Lauffenburger. "2D protrusion but not motility predicts growth factor-induced cancer cell migration in 3D collagen."

Signaling of Adhesion Receptors, Gordon Research Conference June 2012
Meyer, A.S., S.K. Hughes-Alford, J.E. Kay, A. Castillo, A. Wells, F.B. Gertler, D.A. Lauffenburger. "2D protrusion but not motility predicts growth factor-induced cancer cell migration in 3D collagen."

Systems Biology of Human Disease, Travel Award May 2012
Meyer, A.S., S.K. Hughes-Alford, J.E. Kay, A. Castillo, A. Wells, F.B. Gertler, D.A. Lauffenburger. "2D protrusion but not motility predicts growth factor-induced cancer cell migration in 3D collagen."

Fibronectin and Related Integrins, Gordon Research Conference May 2011
Meyer, A.S., S.K. Hughes-Alford, J.E. Kay, A. Castillo, A. Wells, F.B. Gertler, D.A. Lauffenburger. "2D protrusion but not motility predicts growth factor-induced cancer cell migration in 3D collagen."

Fibronectin and Related Integrins, Gordon Research Seminar, Selected Oral Presentation May 2011
Meyer, A.S., S.K. Hughes-Alford, A. Wells, F.B. Gertler, D.A. Lauffenburger. "Heterogeneity of growth factor motility responses among a panel of carcinoma and endometriosis cell lines."

Professional Service

Co-Chair, Association of Early Career Cancer Systems Biologists	2017 – Present
Graduate Research Fellowship Program Review Panelist, National Science Foundation	2016 – Present
Meeting Organizer & Member, Association of Early Career Cancer Systems Biologists	2015 – 2016
Ad Hoc Reviewer, Drug Discovery Today	2016
Ad Hoc Reviewer, Molecular Cell	2015
Member, Biomedical Engineering Society	2010 – Present
Coordinator, MIT Biological Engineering Graduate Student Board	2010 – 2013
Ad Hoc Reviewer, Oncogene	2013
Ad Hoc Reviewer, Nature	2013
Member, MIT Biological Engineering Retreat Organizing Committee	2010 – 2012
Ad Hoc Reviewer, J. Cell Biol.	2011 – 2012

Patents/Disclosures

Richards, E.J., **A.S. Meyer**. "Receptor Ig domain fragments for specific and potent TAM RTK inhibition." Disclosure filed, 2016.

Richards, E.J., S. Manole, **A.S. Meyer**. "Modulating JNK activation to impede lung & breast cancer RTK inhibitor bypass resistance." Disclosure filed, 2016.

Miller, M.A., M.J. Oudin, **A.S. Meyer**, L.G. Griffith, F.B. Gertler, D.A. Lauffenburger. "Methods of Reducing Kinase Inhibitor Resistance." US patent application 14/690,001,2015.