

Nicholas A. Graham, Ph.D.

Contact Information:

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Education:

Postdoctorate, Molecular and Medical Pharmacology (*Oct. 2007 – Dec. 2014*)

University of California, Los Angeles
Advisor: Thomas G. Graeber

Ph.D., Chemical Engineering (*June 2007*)

California Institute of Technology
Advisor: Anand R. Asthagiri
Thesis: Crosstalk between soluble factors and cell-cell interactions:
Implications for cell cycle control and tumor development

M.S., Chemical Engineering (*June 2004*)

California Institute of Technology

B.S., Chemical Engineering and French (*May 2001*)

Washington University in Saint Louis
Magna Cum Laude

Professional Experience:

2015-present	Assistant Professor (Mork Family Dept. of Chemical Engineering and Materials Science, University of Southern California)
2016-present	Associate Member, Norris Comprehensive Cancer Center, University of Southern California
2013-2014	Assistant Project Scientist (Dept. Molecular and Medical Pharmacology, UCLA)
2012-2013	Postdoctoral Scholar in Oncologic Molecular Imaging (Dept. Molecular and Medical Pharmacology, UCLA)
2008-2012	Postdoctoral Fellow, Tumor Cell Biology Training Program (Dept. Molecular and Medical Pharmacology, UCLA)
2007-2008	Postdoctoral Scholar in Oncologic Molecular Imaging (Dept. Molecular and Medical Pharmacology, UCLA)
May-July 2007	Visiting Postdoctoral Fellow (Dept. Molecular Biology and Biochemistry, Simon Fraser University, Burnaby, British Columbia, Canada)
2004-2007	Graduate Student Researcher (Dept. Chemical Engineering, Caltech)
2001-2004	National Defense Science and Engineering Graduate Research Fellow (Dept. Chemical Engineering, Caltech)
June-Aug. 2006	NSF East Asia and Pacific Summer Institute (Dept. of Biotechnology, Yonsei University, Seoul, South Korea)
May-Aug. 2001	Intern in Baby Wipes Engineering Department (Procter and Gamble, Cincinnati, OH)
May-Aug. 2000	Intern in Baby Care Process Development (Procter and Gamble, Cincinnati, OH)
May-Aug. 1999	Intern in Process Engineering (Elf Atochem (now Arkema), Lyon, France)

Peer-reviewed publications:

1. **Graham NA***, Minasyan A*, Lomova A, Cass A, Balanis N, Friedman M, Chan S, Zhao S, Delgado A, Go J, Beck, L, Hurtz C, Ng C, Qiao R, ten Hoeve J, Palaskas N, Wu H, Muschen M, Port E, Larson S, Schultz N, Brass D, Christofk HR, Mellinshoff IK and Graeber TG (2017). Recurrent aneuploidy patterns enable fitness gains in tumor metabolism. *Molecular Systems Biology*, 13:914. PMID: PMC5327725 (*denotes equal contribution).
2. Drake JM, Paull EO, **Graham NA**, Lee JK, Smith BA, Titz B, Stoyanova T, Faltermeier CM, Uzunangelov V, Carlin DE, Fleming DT, Wong CK, Newton Y, Sudha S, Vashisht AA, Huang J, Wohlschlegel JA, Graeber TG, Witte ON and Stuart JM (2016). Phosphoproteome Integration Reveals Patient-Specific Networks in Prostate Cancer. *Cell*, 166(4), 1041-54. PMID: PMC4985183
3. Hong CS, **Graham NA**, Gu W, Camacho CE, Mah V, Maresh EL, Alavi M, Bagryanova L, Krotee PAL, Gardner BK, Behbahan IS, Horvath S, Chia D, Mellinshoff IK, Hurvitz SA, Dubinett SM, Critchlow SE, Kurdistani SK, Goodglick L, Braas D, Graeber TG, Christofk HR (2016). MCT1 modulates cancer cell pyruvate export and growth of tumors that co-express MCT1 and MCT4. *Cell Reports*, 14(7), 1590-601. PMID: PMC4816454
4. Goodwin JF, Kothari V, Drake JM, Zhao S, Dylgjeri E, Dean JL, Schiewer MJ, McNair C, Jones JK, Aytes A, Magee MS, Snook AE, Zhu Z, Den RB, Birbe RC, Gomella LG, **Graham NA**, Vashisht AA, Wohlschlegel JA, Graeber TG, Karnes RJ, Takhar M, Davicioni E, Tomlins SA, Abate-Shen C, Sharifi N, Witte ON, Feng FY, and Knudsen KE (2015). DNA-PKcs mediated transcriptional regulation drives prostate cancer progression and metastasis. *Cancer Cell*, 28(1), 97-113. PMID: PMC4531387
5. Thai M, **Graham NA**, Braas D, Nehil M, Komisopoulou E, Kurdistani SK, McCormick F, Graeber TG and Christofk HR (2014). Adenovirus E4ORF1-induced MYC activation promotes host cell anabolic glucose metabolism and virus replication. *Cell Metabolism*, 19(4), 694-701. PMID: PMC4294542
6. Drake JM, **Graham NA**, Lee JK, Stoyanova T, Faltermeier CM, Sudha S, Titz B, Huang J, Pienta, KJ, Graeber TG and Witte ON (2013). Metastatic castration-resistant prostate cancer reveals intrapatient similarity and interpatient heterogeneity of therapeutic kinases. *Proceedings of the National Academy of Sciences (USA)*, 110(49), E4762-9. PMID: PMC3856845
7. **Graham NA**, Tahmasian M, Kohli B, Komisopoulou E, Zhu M, Vivanco I, Teitell MA, Wu H, Ribas A, Lo RS, Mellinshoff IK, Mischel PS, and Graeber TG (2012). Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death. *Molecular Systems Biology*, 8:589. PMID: PMC3397414 (profiled in accompanying News & Views)
8. Koya RC, Mok S, Otte N, Blacketer KJ, Comin-Anduix B, Tumei PC, Minasyan A, **Graham NA**, Graeber TG, Chodon T, Ribas A (2012). BRAF Inhibitor Vemurafenib Improves the Antitumor Activity of Adoptive Cell Immunotherapy. *Cancer Research*, 72(16), 3928-37. PMID: PMC3422880
9. Drake JM, **Graham NA**, Stoyanova T, Sedghi A, Goldstein AS, Cai H, Smith DA, Zhang H, Komisopoulou E, Huang J, Graeber TG, and Witte ON (2012). Oncogene-specific activation of tyrosine kinase networks during prostate cancer progression. *Proceedings of the National Academy of Sciences (USA)*, 109(5), 1643-8. PMID: PMC3277127
10. Tumei PD, Koya RC, Chodon T, **Graham NA**, Graeber TG, Comin-Anduix B, and Ribas A (2010). The impact of ex vivo clinical grade activation protocols on human T-cell phenotype and function for the generation of genetically modified cells for adoptive cell transfer therapy. *The Journal of Immunotherapy*, 33(8), 759-68. PMID: PMC3114626
11. Sun J*, Masterman-Smith M*, **Graham NA***, Jiao J*, Mottahedeh J, Laks DR, Ohashi M, DeJesus J, Kamei K, Lee KB, Wang H, Yu ZT, Lu YT, Hou S, Li K, Liu M, Zhang N, Wang S, Angenieux B, Panosyan E, Samuels ER, Park J, Williams D, Konkankit V, Nathanson D, van Dam RM, Phelps ME, Wu H, Liao LM, Mischel PS, Lazareff JA, Kornblum HI, Yong WH, Graeber TG and Tseng HR (2010). A microfluidic platform for systems pathology: multiparameter single-cell signaling measurements of clinical brain tumor specimens. *Cancer Research*, 70(15), 6128-38. PMID: PMC3163840 (*denotes equal contribution)
12. Kim JH, Kushiro K, **Graham NA**, Asthagiri AR (2009). Tunable Interplay between epidermal growth factor and cell-cell contact governs the spatial dynamics of epithelial growth. *Proceedings of the National Academy of Sciences (USA)*, 106(27), 11149-53. PMID: PMC2708686
13. Pope MD, **Graham NA**, Huang BK, and Asthagiri AR (2008). Automated quantitative analysis of epithelial cell scatter. *Cell Adhesion & Migration*, 2(2), 110-6. PMID: PMC2634994

14. **Graham NA**, Pope MD, Rimchala T, Huang BK, and Asthagiri AR (2007). A microtiter assay for quantifying protein-protein interactions associated with cell-cell adhesion. *The Journal of Biomolecular Screening*, 12(5), 683-93.
15. **Graham NA** and Asthagiri AR (2004). EGF-mediated Tcf/Lef transcriptional activity is essential, but not sufficient, for cell cycle progression in non-transformed mammary epithelial cells. *The Journal of Biological Chemistry*, 279(22), 23517-24.

Invited Commentaries:

1. **Graham NA**, Graeber TG (2014). Complexity of metastasis-associated SDF-1 ligand signaling in breast cancer stem cells. *Proceedings of the National Academy of Sciences (USA)*, Epub May 14.
Invited commentary on Yi et al (2014). Quantitative phosphoproteomic analysis reveals system-wide signaling pathways downstream of SDF-1/CXCR4 in breast cancer stem cells. *Proceedings of the National Academy of Sciences (USA)*, Epub April 29.

Conference Presentations:

Invited Oral Presentations

1. University of Southern California, Da Vinci Convergent Science Symposium, March 2017
2. University of Southern California, Department of Chemistry, Sept. 2015
3. The Ohio State University, Lowrie Department of Chemical and Biomolecular Engineering, April 2014
4. University of Southern California, Mork Family Department of Chemical Engineering and Materials Science, March 2014
5. Virginia Commonwealth University, Department of Chemical and Life Science Engineering, Feb. 2014
6. Arizona State University, Department of Chemical Engineering, Feb. 2014
7. University of California, Los Angeles, Chemistry-Biology Interface Training Program, Feb. 2014
8. University of California, Los Angeles, Department of Molecular and Medical Pharmacology 'Pharm Fridays', Sept. 2012
9. Los Angeles Tissue Engineering Initiative, Dec. 2006
10. California Institute of Technology Department of Biology BioLunch Seminar, Nov. 2006
11. California Institute of Technology, Department of Chemical Engineering Graduate Student Seminar Series, 2004.

Contributed Oral Presentations

1. American Institute of Chemical Engineers (AIChE) Annual Meeting, *Recurrent Patterns of DNA Copy Number Alterations in Tumors Reflect Metabolic Selection Pressures*, Nov. 2016.
2. AIChE Annual Meeting, *Phospho-proteomics reveals oncogenic phospho-tyrosine signaling networks in cancers lacking mutated or amplified tyrosine kinases*, Nov. 2013.
3. Biomedical Engineering Society (BMES) Annual Meeting, *Oncogenic phospho-tyrosine signaling in the absence of mutated or amplified tyrosine kinases*, Sept. 2013.
4. Society for Melanoma Research Congress, *Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death*, Nov. 2012.
5. AIChE Annual Meeting, *Analysis and Visualization of Multiparameter, Single-Cell Data Using Self-Organizing Maps*, Nov. 2012.
6. AIChE Annual Meeting, *Phospho-proteomics reveals a metabolic and signaling amplification loop leading to cell death following glucose deprivation*, Oct. 2012.
7. BMES Annual Meeting, *Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death*, Oct. 2012.
8. UCLA Dept. Molecular and Medical Pharmacology Annual Retreat, *Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death*, Nov. 2011.
9. AIChE Annual Meeting, *Parsing the crosstalk between prominent oncogenic signaling pathways*, Nov. 2006.

10. Society for Biological Engineering's International Conference on Bioengineering and Nanotechnology, *Parsing the crosstalk between prominent oncogenic signaling pathways*, Sept. 2006.
11. AIChE Annual Meeting, *Topology and dynamics of pro-mitogenic β -catenin signaling in mammary epithelial cells*, Nov. 2005.
12. California Tissue Engineering Meeting, *Antagonistic signaling between cell-cell contact and EGF regulates contact-inhibition of proliferation*, Sept. 2005.
13. UCLA Biomedical Engineering Conference, *Intercellular contact inhibits proliferation by regulating intracellular signals*, Jan. 2005.
14. AIChE Annual Meeting, *Intercellular contact inhibits proliferation by restricting spatial localization of pro-mitogenic intracellular signals*, Nov. 2004

Contributed Poster Presentations

1. Keystone Symposium on Tumor Metabolism, *Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death*, Feb. 2013.
2. UCLA Dept. of Molecular and Medical Pharmacology Annual Retreat, *DNA copy number alterations of energy metabolism genes are enriched in highly glycolytic and genomically unstable tumors*, Nov. 2012.
3. City of Hope Beckman Symposium: Cancer as a metabolic disease, *Glucose deprivation activates a metabolic and signaling amplification loop leading to cell death*, Nov. 2011.
4. American Association of Cancer Research Systems Biology: Confronting the Complexity of Cancer Meeting, *A microfluidic platform for systems pathology: Multiparameter single-cell measurements of cell signaling in clinical brain tumor specimens*, Feb. 2011.
5. UCLA Dept. Molecular and Medical Pharmacology Annual Retreat, *Cross-talk between metabolism and signaling: Glucose withdrawal induces a positive feedback loop between reactive oxygen species, tyrosine phosphatase inhibition and kinase signaling that results in cell death*, Oct. 2010
6. Salk Institute Meeting on Protein Phosphorylation and Cell Signaling: 30 Years of Tyrosine Phosphorylation, *A Microfluidic Platform for Systems Pathology: Multiparameter Single-cell Measurements of Cell Signaling in Clinical Brain Tumor Specimens*, Aug 2010.
7. UCLA Dept. Molecular and Medical Pharmacology Annual Retreat, *Microfluidic image cytometry technology for analysis of signaling and metabolic pathways in individual tumor cells*, Nov. 2009.
8. American Association of Cancer Research Metabolism and Cancer Meeting, *A microfluidic platform for systems analysis of signaling and metabolism: single-cell measurements of clinical brain tumor specimens*, Sept. 2009.
9. UCLA Dept. Molecular and Medical Pharmacology Annual Retreat, *Interactions between signaling and metabolism: Glucose Addiction in Glioblastoma Cell Lines*, Nov. 2008
10. Society for Biological Engineering's International Conference on Biomolecular Engineering, *Parsing the crosstalk between prominent oncogenic signaling pathways*, Jan. 2007

Fellowships, Honors, and Awards:

2013	Best postdoctoral poster, UCLA Dept. Molecular and Medical Pharmacology Annual Retreat
2013	Best postdoctoral oral presentation, Crump Institute for Molecular Imaging Research Seminar
2012-2014	Scholars in Oncologic Molecular Imaging Postdoctoral Fellowship (National Cancer Institute Cancer Education and Career Development Program #R25T CA098010)
2011	Best postdoctoral oral presentation, UCLA Dept. Molecular and Medical Pharmacology Annual Retreat
2011	Axel Ullrich Scholar-in-Training award for AACR-NCI Conference on Systems Biology
2009-2012	Tumor Cell Biology Postdoctoral Fellowship (USHHS Ruth L. Kirschstein Institutional National Research Service Award #T32 CA009056)
2007-2008	Scholars in Oncologic Molecular Imaging Postdoctoral Fellowship (National Cancer Institute Cancer Education and Career Development Program #R25 CA092408)
2006	NSF East Asia and Pacific Summer Institute
2001-2004	National Defense Science and Engineering Graduate Fellowship

- 1997-2001 Stanley C. Pace Undergraduate Fellowship (School of Engineering and Applied Science, Washington University)
1997-2001 National Merit Scholar (Honeywell Foundation)

Membership / Services:

- 2016-2017 Session co-chair “Cell Culture Engineering”, “Cell Culture Process Design” and “Engineering in Cancer Biology and Therapy” for AIChE Annual Meeting
2016-2017 Reviewer for *Molecular Systems Biology* and *Science Signaling*
2008-2013 Reviewer for *Nature Communications* (with Heather Christofk, UCLA), Reviewer for *BBA Molecular Cell Research*, *Nature Biotechnology*, *PLoS Computational Biology*, *PLoS ONE*, and *Molecular Systems Biology* (with Thomas Graeber, UCLA)
2005-2007 Biophysics Lecture Series Planning Committee (Caltech)
1998-2001 Tau Beta Pi Engineering Honor Society (Washington University)