Curriculum Vitae

Jonathan M. Irish, Ph.D.

Education

1998	University of Michigan, B.S. Chem. in Chemistry
1998	University of Michigan, B.S. in Biochemistry
1998	University of Michigan, B.S. in Honors Biology
2004	Stanford University, Ph.D. in Cancer Biology

Academic Positions

1995-1998	**Student Instructor** with Dr. Brian P. Coppola, Arthur F. Thurnau Professor of Chemistry, Associate Chair for Curriculum and Faculty Affairs, University of Michigan, Ann Arbor, MI.
1998-2004	**Graduate Student** with Dr. Garry P. Nolan, PhD, Professor of Microbiology and Immunology, Baxter Laboratories, Stanford University, Stanford, California.
2004-2009	**Postdoctoral Scholar** with Dr. Ronald Levy, MD, Professor of Medicine; Chief, Division of Oncology, Stanford University School of Medicine, Stanford, CA.
2009-2011	**Instructor of Medicine** with Dr. Ronald Levy, MD, Professor of Medicine; Chief, Division of Oncology, Stanford University School of Medicine, Stanford, CA.
2011-	**Assistant Professor**, Department of Cancer Biology Vanderbilt University School of Medicine, Nashville, Tennessee. Single cell systems biology and translational research in cancer and immunology.

Vanderbilt Department and Program Affiliations

Primary	CANB – Department of Cancer Biology
Secondary	PMI – Department of Pathology, Microbiology & Immunology
	VICC – Vanderbilt-Ingram Cancer Center
	CQS – Center for Quantitative Sciences
	VICB – Vanderbilt Institute of Chemical Biology
	VUIIS – Vanderbilt University Institute of Imaging Science

Major Research Interests

Single cell biology
Cancer
Immunology
Personalized medicine
Machine learning
Computational biology

Fellowships

2000-2003 James H. Clark Graduate Fellow, Stanford University

2003-2004 G.J. Lieberman Fellow, Stanford University

2004-2005 Postdoctoral Fellowship in Immunology, Stanford University

2005-2008 Fellow of the Leukemia and Lymphoma Society

2009-2012 K99 Howard Temin Pathway to Independence Award in Cancer Research (NIH/NCI)

Ongoing Research Grants with Effort

2015-2017 Incyte Clinical Research (PI: **Irish JM**)
High dimensional monitoring of myeloid and T cell immune response signatures in MDS and AML patient biopsies.
Role: PI; sub-project of the Vanderbilt/Incyte Alliance (PI: Savona).

2016 Vanderbilt-Ingram Cancer Center Pilot (PI: **Irish JM** & Jagasia M)
Predicting GVHD response: using CyTOF to interrogate alloreactivity
Role: co-PI

2014-2016 Vanderbilt University: Discovery Grant (PI: **Irish JM**, Bachmann BO, Sulikowsky GA)
Targeting the B cell receptor signaling network in lymphoma
Role: co-PI

2012-2015 NIH/NCI R01 CA116021-11 (PI: Richmond AR)
Improved therapy for p53wt melanoma by functionally restoring the CDKN1A pathway
Role: 5% effort by JMI for advanced cytometry

2015-2019 VA Merit Application (PI: Massion P)
Molecular Determinants of Small Cell Lung Cancer Behavior
Role: 5% effort by JMI and 50% effort by Irish lab graduate student for advanced cytometry

Completed Research Grants

2012-2015 NIH/NCI R00 CA143231-03 (PI: **Irish JM**)
Targeting the B cell receptor signaling network in lymphoma
Role: PI

2009-2012 NIH/NCI K99 CA143231-01 (PI: **Irish JM**)
Targeting the B cell receptor signaling network in lymphoma
Role: PI

2012-2013 Vanderbilt-Ingram Cancer Center (VICC): Provocative Questions (PI: **Irish JM** & Kelley MC)
Thanks to: Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation (http://www.klebergfoundation.org/), T.J. Martell Foundation (http://www.tjmartell.org/), and VICC NIH/NCI P30 CA068485
Targeting signaling networks in subpopulations of B-RAF mutation positive melanoma cells during B-RAF and MEK targeted therapy
Role: PI

2012-2014 VICC Ambassadors: Discovery Grant (PI: **Irish JM**)
Thanks to: VICC Ambassadors (http://youngambassadors.vicc.org/) and VICC NIH/NCI P30 CA068485
Single cell signaling profiles of melanoma and tumor infiltrating T cells before and after combination therapy targeting signaling in both tumor & immune system
Role: PI

Completed Research Grants, continued

2013-2014 Hematology Helping Hand Fund: Discovery Grant (PI: **Irish JM**)
Thanks to: Team Chad (http://www.teamchad.us/) and VICC NIH/NCI P30 CA068485
Novel Prognostic Biomarkers of Resistance in AML
Role: PI

Invited Speaking & Course Instruction (invited unless noted as "Abstract Selected")

2003 ► EMBO Practical Course, Advanced Cytometry

2004 ► Banbury Center Meeting, Cold Spring Harbor

2005 ► American Society of Hematology (ASH) Annual Meeting, Abstract Selected

2007 ► NIH/NCI, Integrative Cancer Biology Program (ICBP), Data Integration Workshop

2008 ► EMBO Practical Course, Advanced Cytometry

2009 ► University of Bergen, Cancer Research Retreat (Keynote) ► Harvard Medical School
► Keystone Symposium, "B Cells in Context", Abstract Selected

2010 ► ASH Annual Meeting, Abstract Selected ► Memorial Sloan Kettering Cancer Center

2011 ► Stanford University ► Center for Immunology Marseille-Luminy, Advanced Cytometry Course
► INSERM Toulouse, Cytometry Workshop ► International Society of Analytic Cytometry (ISAC), CYTO Annual Meeting PreCongress ► International Clinical Cytometry Society (ICCS)

2012 ► French Association of Cytometry, Annual Meeting (Plenary) ► University of Alabama Birmingham
► ISAC, CYTO Annual Meeting PreCongress ► INSERM Toulouse, Intracellular Flow Cytometry Workshop
► NIH/NCI ICBP Junior Investigator Meeting, "Science & Career"

2013 ► Harvard/MIT ► MD Anderson Cancer Center ► EMBO Practical Course, Advanced Cytometry
► INSERM Bordeaux, Advances in Cytometry Workshop ► ISAC, CYTO Annual Meeting, PreCongress
► Webinar: "Single cell systems biology of signaling networks in human disease using mass cytometry"

2014 ► University of Virginia Cancer Center ► American Academy of Allergy, Asthma, & Immunology, Annual Meeting ► Eastern Cooperative Oncology Group (ECOG), Leukemia Group ► Southeastern Immunology Symposium
► PittCon, Annual Meeting

2015 ► Australasian Cytometry Society, Annual Meeting (Plenary) ► Society for Melanoma Research, Annual Meeting
► Stanford University ► MD Anderson, Hematology Grand Rounds ► Washington University St. Louis
► King's College, London ► Translational Summit on the Immune Microenvironment in Cancer, Washington DC ► Novartis Institutes for Biomedical Research, Boston ► ISAC, CYTO Annual Meeting, Abstract Selected
► Webinar: "Human solid tumor cytomics: revealing novel melanoma and immune cell subsets"

2016 ► University of Virginia (Plenary) ► Moffitt Cancer Center ► University of Texas, Baylor
► Southeast Flow Cytometry Interest Group (SEFCIG), Annual Meeting

Mentoring, Instructor at Stanford University

Mentoring of Pre-docs as Instructor (3):

2005-2010 Nikesh Kotecha, PhD, Consulting Assistant Professor, Stanford University; Co-founder Cytobank Inc.
h-index: 7, Publications: Google Scholar | Pubmed

2006-2009 Maria Jabon, M.S., Senior Software Engineer, LinkedIn

2009-2011 Kacey Sachen, PhD, Senior Research Scientist I at Kyowa Hakko Kirin California, Inc.
Publications: Pubmed

Mentoring of Post-docs as Instructor (1):

2007-2009 June H. Mykelbust, PhD, Assistant Professor, The Norwegian Radium Hospital, Oslo, Norway
Publications: Pubmed

Mentoring of Irish Lab Members, Assistant Professor at Vanderbilt University

Mentoring of Pre-docs as Assistant Professor (5)

2012-current Deon Doxie, BS, PhD Candidate in Cancer Biology at Vanderbilt University
h-index: 3, Publications: Google Scholar | Pubmed | orcid.org/0000-0002-5383-0441

2012-current Cara Wogsland, BS, PhD Candidate in Microbiology & Immunology at Vanderbilt University
h-index: 1, Publications: Google Scholar | Pubmed | orcid.org/0000-0003-1797-7902

2013-current Allison Greenplate, BS, PhD Candidate in Microbiology & Immunology at Vanderbilt University
h-index: 5, Publications: Google Scholar | Pubmed | orcid.org/0000-0002-2614-3072

2013-current Kirsten Diggins, BS, PhD Candidate in Cancer Biology at Vanderbilt University;
h-index: 2, Publications: Google Scholar | Pubmed | orcid.org/0000-0003-1622-0158

2013-current Nalin Leelatian, MD, Clin Path, PhD Candidate in Cancer Biology at Vanderbilt University
h-index: 1, Publications: Google Scholar | Pubmed | orcid.org/0000-0003-4284-8272

Mentoring of Post-docs as Assistant Professor (3)

2013-2014 Kanutte Huse, PhD, Postdoctoral Fellow & Head Engineer at Flow Cytometry Core Facility, University of Oslo, Norway. (Pubs)
h-index: 6, Publications: Google Scholar | Pubmed | orcid.org/0000-0001-9128-670X

2014-2015 Mikael Roussel, MD/PhD, Faculty of Medicine, CHU Rennes, France
h-index: 12, Publications: Google Scholar | Pubmed | orcid.org/0000-0002-9741-0668

2012-current P. Brent Ferrell, MD – Instructor of Medicine, Vanderbilt University.
h-index: 2, Publications: Google Scholar | Pubmed | orcid.org/0000-0003-1140-9154

Other Mentoring as Assistant Professor (1)

2012-2014 Hannah Polikowsky, BS, Consultant at Cytobank Inc.
h-index: 2, Publications: Google Scholar | Pubmed | orcid.org/0000-0001-7226-9752

Graduate Program Qualifying Exams and Thesis Committees (Vanderbilt University)

2012 Michelle Krakowiak (Peek) – Cancer Biology, Qualifying Exam

2012-2014 Chase Spurlock (Aune) – Microbiology & Immunology, Qualifying Exam + Thesis Committee

2013 Catherine Meador (Pao) –Cancer Biology / MSTP, Qualifying Exam

2012-2015 Akshata Udyavar (Quaranta & Massion) – Chemical & Physical Biology, QE + Thesis Committee

2012-current Huapeng Yu (Reynolds) – Cancer Biology, Qualifying Exam + Thesis Committee

2012-current David Earl (Bachmann & Sulikowski) – Chemical Biology, Qualifying Exam + Thesis Committee

2012-current Katie Nicholas (Kalams) – Microbiology & Immunology, Qualifying Exam + Thesis Committee

2013-current Chris Wilson (Moore) – Microbiology & Immunology, Qualifying Exam + Thesis Committee

2013-current Jessica Finn (Crowe) – Microbiology & Immunology, Qualifying Exam + Thesis Committee

2013-current Kirsten Guckes (Hadjifrangiskou) – Microbiology & Immunology, Qualifying Exam + Thesis Committee

Teaching, Leadership, and Responsible Conduct of Research

1995-1998 President, American Chemical Society Students, University of Michigan

1996-1998 President, Students of Biology, University of Michigan

1996-1998 Undergraduate Student Instructor, **Organic Chemistry**, Univ. of Michigan Chemistry Dept.
Role: Teaching and grading four hour lab and 2 hour discussion once per week as part of Honors Undergraduate Teaching Fellowship with Dr. Brian P. Coppola.

2000 & 2001 Student Chair, Cancer Biology Admissions Planning Committee, Stanford University

2001-2002 Designer, Graduate Student Instructor, **Cancer Biology 241** (core course), Stanford University

2003, 2008 Instructor, EMBO Course on Advanced Cytometry and Cell Sorting, DRFZ Berlin

2006-2010 Leader, Cytobank Bioinformatics and Systems Biology group, Stanford University
Role: Lead a team of biology and computer programming students to produce a new analysis tool for phospho-specific flow cytometry through weekly planning meetings.

2007-2011 Instructor and Organizer, Advanced Flow Cytometry Workshop, University of Bergen

2005-2011 Instructor, yearly "Phospho-Flow 101" Lab Practical Training Course, Stanford University

2012 Instructor, **Responsible Conduct of Research** course, Vanderbilt University
Role: Attended the full day seminar series and taught a 1-hour section that explored responsible conduct of research scenarios with Vanderbilt graduate and postdoctoral students.

2012-current Lecturer for **M&IM 3283**, Vanderbilt Graduate Course: **Molecular & Cellular Immunology**
Role: Taught a 2 hour didactic lecture on tumor immunology.

2013-current Lecturer for **CANB 347**, Vanderbilt Graduate Course: **Cancer Systems Biology**
Role: Taught a 1.5 hour didactic lecture on quantitative single cell analysis of cancer signaling.

2013-2014 Lecturer for **M&IM 334**, Vanderbilt Graduate Course: **Foundations in Micro. & Immunology**
Role: Taught a 1 hour didactic lecture on signaling & led a 2 hour journal club on "The initiation of antigen-induced B cell antigen receptor signaling viewed in living cells by fluorescence resonance energy transfer", Tolar P, Sohn HW, and Pierce SK 2005 *Nature Immunology*

2015-current Lecturer for **BMIF 310**, Vanderbilt Graduate Course: **Foundations of Bioinformatics**
Role: Taught two 1 hour lectures on biomedical informatics and quantitative signaling analysis.

Teaching, Leadership, and Responsible Conduct of Research, continued

2015-current Lecturer for **M&IM 334**, Vanderbilt Graduate Course: **Foundations in Micro. & Immunology**
Role: Taught a 1 hour didactic lecture on signaling & led a 2 hour journal club on "High-dimensional analysis of the murine myeloid cell system", Becher et al. 2014 *Nature Immunology*

2016 Organizer of Vanderbilt **Tumor Immunology Work-in-Progress** student seminar series
Role: Initiated and organized a monthly 1-hour pair of 2 lectures from graduate and postdoctoral students on the topic of tumor immunology. Each pair of lectures was designed to include two different departments or schools and included Cancer Biology, Microbiology & Immunology, Medicine, Chemistry, and Engineering. Organized with conjunction with the Center for Immunobiology with Jeff Rathmell.

Academic Service

2013 Institutional Data Retention – SOP Taskforce, Vanderbilt University Office of Research

2014 Working Group, Qualifying Exam/Thesis Committees, Vanderbilt University Microbiology & Immunology Ph.D. Program

2014 Working Group, Student Mentoring/Career Advising, Vanderbilt University Microbiology & Immunology Ph.D. Program

2014-2015 Institutional Shared Resources Oversight Committee (ISROC), Vanderbilt University

Other Honors

1993, 1994 US National 1st Place in Science Olympiad, Grand Haven High School

1994 National Science Scholar, USA

1997 Regents Alumni Scholar, University of Michigan

1998 Distinguished Leadership Award, University of Michigan

2004 Immunology Training Award, Federation of Clinical Immunology Societies (FOCiS)

2006 Keystone Symposia Scholarship

2015 Grand Haven High School Hall of Fame

Patents

Methods and Compositions for Risk Stratification, US Patent (US 7,393,656, US 7,939,278, US US 8,206,939, US 8,309,316, US 8,394,599)

Consulting & External Interests, Disclosures

2007-2009 Consultant, Nodality Inc.

2010-current Co-Founder, Board Member, Chief Science Officer, Cytobank Inc.

2012-current Invited Speaking, CYTO Satellite Meeting and Webinars, Fluidigm

2015 Speaking Honorariums: Novartis, Kite, Stanford

2015 Research Collaboration, Karyopharm

2015-current Sponsored Research, Incyte

Publications – Undergraduate

1. Fields RF and **Irish JM**, Generate and Select: An expert-system-derived, active-learning approach for teaching organic chemistry. ***Chemical Educator*** Feb 1998; Vol 3(1). DOI: 10.1007/s00897980176a

   ► Report on the 'Generate and Select' approach that teaches undergraduate chemistry students to create a framework for evaluating new data and ideas (rather than memorization).

2. Blum SA and **Irish JM**, The MATCH Program: Integrating student learning in science and math. ***Chemical Educator*** Feb 1998; Vol 3(1). DOI: 10.1007/s00897980168a

   ► Report on teaching integrated mathematics and chemistry through modeling and data visualization.

Publications – Ph.D. thesis research, Stanford University

3. Armstrong JS, Steinauer KK, Hornung B, **Irish JM**, Lecane P, Birrell GW, Peehl DM, Knox SJ. Role of glutathione depletion and reactive oxygen species generation in apoptotic signaling in a human B lymphoma cell line. ***Cell Death and Differentiation*** 2002 Mar;9(3):252-63. PMID: 11859408

4. Krutzik PO, **Irish JM**, Nolan GP, Perez OD, Analysis of protein phosphorylation and cellular signaling events by flow cytometry: techniques and clinical applications. ***Clinical Immunology*** 2004 Mar;110(3):206-21. PMID: 15047199

5. **Irish JM**, Hovland R, Krutzik PO, Perez OD, Bruserud Ø, Gjertsen BT, Nolan GP. Single cell profiling of potentiated phospho-protein networks in tumor cells. ***Cell*** 2004 Jul 23;118(2):217-28. PMID: 15260991

   ► Created a new single cell approach to profiling cell signaling and used this technique to analyze acute myelogenous leukemia patient samples. Showed patterns of JAK/STAT and MAPK signaling stratify AML patient clinical outcomes, including the response to induction chemotherapy.

6. **Irish JM**, Kotecha N, Nolan GP. Mapping normal and cancer cell signalling networks: towards single-cell proteomics. ***Nature Reviews Cancer*** 2006 Feb;6(2):146-55. PMID: 16491074

   ► Described the 'single cell signaling profile' approach to dissecting cancer cell signaling networks and stratification of patient outcome.

7. **Irish JM**, Ånensen N, Hovland, R, Borreson-Dale AL, Bruserud Ø, Nolan GP, Gjertsen BT. Flt3 Y591 duplication and Bcl-2 overexpression are detected in acute myeloid leukemia cells with high levels of phosphorylated wild-type p53. ***Blood*** 2006 Nov 14. PMID: 17105820

Publications – Postdoctoral Fellow, Stanford University

8. **Irish JM**, Czerwinski DK, Nolan GP, Levy R. Kinetics of B cell receptor signaling in human B cell subsets mapped by phosphospecific flow cytometry. ***Journal of Immunology*** 2006 Aug 1;177(3):1581-9. PMID: 16849466

   ► Defined cell-intrinsic mechanisms regulating differential signaling kinetics in mature and memory B cells from healthy human blood.

9. **Irish JM**, Czerwinski DK, Nolan GP, Levy R. Altered B-cell receptor signaling kinetics distinguish human follicular lymphoma B cells from tumor-infiltrating nonmalignant B cells. ***Blood*** 2006 Nov 1;108(9):3135-42. PMC1895530

   ► Identified lymphoma cell specific changes signaling network kinetics by comparing individual tumor and non-tumor B cells within the same patient sample.

10. Van Meter ME, Diaz-Flores E, Archard JA, Passegue E, **Irish JM**, Kotecha N, Nolan GP, Shannon K, Braun BS. K-RasG12D expression induces hyperproliferation and aberrant signaling in primary hematopoietic stem/progenitor cells. ***Blood*** 2007 May 1;109(9):3945-52. PMC1874575

11. Kotecha N, Flores NJ, **Irish JM**, Simonds E, Sakaguchi D, Archambeault S, Diaz-Flores E, Coram M, Shannon KM, Nolan GP, Loh ML. Single cell profiling identifies aberrant STAT5 activation in myeloid malignancies with specific clinical and biologic features. ***Cancer Cell*** 2008 Oct 7;14(4):335-43. PMC2647559

Publications – Postdoctoral Fellow, Stanford University continued

12. Hammer MM, Kotecha N, **Irish JM**, Nolan GP, Krutzik PO. WebFlow: a software package for high-throughput analysis of flow cytometry data. ***Assay & Drug Development Technology*** 2009 Feb;7(1):44-55. PMID: 19187010

13. Houot R, Goldstein MJ, Kohrt HE, Myklebust JH, Alizadeh AA, Lin JT, **Irish JM**, Torchia JA, Kolstad A, Chen L, Levy R. Therapeutic effect of CD137 immunomodulation in lymphoma and its enhancement by Treg depletion. ***Blood*** 2009 Oct 15;16(4):3431-3438. PMC2765679

14. Sachs K, Gentles AJ, Youland R, Itani S, **Irish J**, Nolan GP, Plevritis SK. Characterization of patient specific signaling via augmentation of Bayesian networks with disease and patient state nodes. ***Conference Proceedings: IEEE Engineering in Medicine and Biology Society*** 2009;2009:6624-7. PMID: 19963681

15. **Irish JM**, Myklebust JH, Alizadeh AA, Houot R, Sharman JP, Czerwinski DK, Nolan GP, Levy R. Inaugural Article: B cell signaling networks reveal a negative prognostic human lymphoma cell subset that emerges during tumor progression. ***Proceedings of the National Academy of Sciences USA*** 2010 Jul 20;107(29):12747-54.

    ►Identified a novel, clinically significant type of lymphoma cell based on systems analysis of hundreds of B and T cell signaling events and demonstrated these cells are associated with poor overall survival.

16. Kotecha N, Krutzik PO, **Irish JM**. Web-based Analysis and Publication of Flow Cytometry Experiments. ***Current Protocols in Cytometry*** 2010 Jul, Chapter 10, Unit10.17.

    ► Created Cytobank cloud software for single cell data analysis, now hosted by Cytobank Inc. and in use at 100s of the top academic centers and pharmaceutical companies (http://www.cytobank.org/).

Publications – Assistant Professor at Vanderbilt University

17. Blix E, **Irish JM**, Husebekk A, Delabie, Tierens AM, Myklebust JH, Kolstad A. Altered BCR and CD40 signaling are associated with clinical outcome in small lymphocytic lymphoma/chronic lymphocytic leukemia and marginal zone lymphoma patients. ***Br. J. Hematology*** 2012 Dec;159(5):0.

18. Blix E, **Irish JM**, Husebekk A, Delabie J, Forfang L, Tierens AM, Myklebust JH, Kolstad A. Phospho-specific flow cytometry identifies aberrant signaling in indolent B-cell lymphoma. ***BMC Cancer*** 2012 Oct 16;12(1):478.

19. Green MR, Gentles AJ, Nair RV, **Irish JM**, Kihira S, Kela I, Hopmans ES, Myklebust JH, Ji H, Plevritis SK, Levy R, Alizadeh AA. Hierarchy in somatic mutations arising during genomic evolution and progression of Follicular Lymphoma. ***Blood*** 2013 Jan 7.

20. Myklebust JH, **Irish JM**, Brody J, Czerwinski DK, Houot R, Kohrt HE, Timmerman J, Said J, Green MR, Delabie J, Kolstad A, Alizadeh AA, Levy R. High PD-1 expression and suppressed cytokine signaling distinguish T cells infiltrating follicular lymphoma tumors from peripheral T cells. ***Blood*** 2013 Jan 7.

21. Doxie DB, **Irish JM**. High-dimensional single-cell cancer biology. **Curr. Top. in Microbiology & Immunology** 2014.

    ► Described biological features quantifiable in individual cells and applications in cancer research.

22. Huse K, Wogsland CE, Polikowsky HG, Diggins KE, Myklebust JH, **Irish JM**. Deep profiling human germinal center B cell signaling and immunophenotype. **Keystone Symposia Poster**, Biology of B cell Responses 2014

23. Pyne S, Lee SX, Wang K, **Irish J**, Tamayo P, Nazaire MD, Duong T, Ng SK, Hafler D, Levy R, Nolan GP, Mesirov J, McLachlan GJ. Joint modeling and registration of cell populations in cohorts of high-dimensional flow cytometric data. **PLoS ONE** 2014 Jul.

24. Ferrell B, Diggins KE, Polikowsky HG, Myklebust JH, **Irish JM**. Mass Cytometry of Acute Myeloid Leukemia Captures Early Therapy Response in Rare Cell Subsets. **American Society of Hematology Poster** 2014

25. **Irish JM**. Beyond the age of cellular discovery. **Nature Immunology** 2014 Nov 14.

    ► Described how mass cytometry & machine learning are powering comprehensive single cell studies of primary tissues.

26. Green MR, Kihira S, Liu CL, Nair RV, Salari R, Gentles AJ, **Irish J**, Stehr H, Vicente-Dueñas C, Romero-Camarero I, Sanchez-Garcia I, Plevritis SK, Arber DA, Batzoglou S, Levy R, Alizadeh AA.. Mutations in early follicular lymphoma progenitors are associated with suppressed antigen presentation. ***Proceedings of the National Academy of Sciences USA***. 2015 Mar 10;112(10):E1116-25. Epub 2015 Feb 23. PMID: 25713363

Publications – Assistant Professor at Vanderbilt University, continued

27. Greenplate AR, Nicholas KJ, Doxie DB, Kelley MC, Sosman JA, Kalams SA, **Irish JM**. "High-dimensional analysis of stimulated human T cells in healthy donors and patients with melanoma" **Keystone Symposia Poster** 2015

28. Shah AT, Diggins KE, **Irish JM**, Skala MC. "Label free microscopy quantifies treatment-induced heterogeneity in vivo". **Advances in Optics XIV Poster** 2015

29. Diggins KE, Ferrell BG, **Irish JM**. Methods for discovery and characterization of cell subsets in high dimensional mass cytometry data. **Methods** 2015
    ► **Developed automated, unsupervised workflow for mass cytometry by combining existing tools.**

30. Polikowsky HG, Wogsland CE, Diggins KE, Huse K*, **Irish JM***. Redox signaling hypersensitivity distinguishes human germinal center B cells. **Journal of Immunology** 2015
    ► **Used phospho-specific flow cytometry and high-dimensional mass cytometry (CyTOF) to compare signaling responses in mature human tonsillar B cells undergoing germinal center (GC) reactions.**

31. Leelatian N, Diggins KE, **Irish JM**. Characterizing phenotypes and signaling networks of human cells by mass cytometry. **Methods in Molecular Biology** 2015.
    ► **Protocols for preparation, cyropreservation, and mass cytometry analysis of human tissue biopsies.**

32. Simmons A, Banerjee A, McKinley E, Scurrah C, Herring C, Franklin J, Gerdes M, **Irish JM**, Coffey R, Lau K. Cytometry-based single cell analysis of intact epithelial signaling reveals divergent MAPK activation from TNF-α-induced apoptosis in vivo. **Molecular Systems Biology** 2015.

33. Nicholas KJ, Greenplate AR, Flaherty DK, Matlock BK, San Juan J, Smith RM, **Irish JM**, Kalams SA. Multiparameter analysis of stimulated human peripheral blood mononuclear cells: a comparison of mass and fluorescence cytometry. **Cytometry** 2015.

34. Shah AT, Diggins KE, **Irish JM**, Skala MC. In Vivo Autofluorescence Imaging of Head and Neck Cancer Quantifies Treatment-Induced Metabolic Shifts in Single Cells. **Neoplasia** 2015

Publications – *In press* – Assistant Professor at Vanderbilt University

35. Roussel M, Greenplate AG, **Irish JM**. Dissecting complex cellular systems with mass cytometry. **Human Innate Immunity** 2016 *in press*.
    ► **100 years characterizing myeloid cell subsets: from microscopy to mass cytometry.**

36. Greenplate AR, Johnson DB, Roussel M, Savona MR, Sosman JA, Puzanov I, Ferrell PB*, **Irish JM***. Systems Immunology of Checkpoint Inhibitor Therapy: A Case Study of Myelodysplastic Syndrome Revealed in a Melanoma Patient Undergoing Anti-PD-1 Therapy. **Cancer Immunology Research** 2016 *in press*

37. Johnson DB, Estrada MV, Salgado R, Sanchez V, Doxie DB, Opalenik SR, Johnson AS, Greenplate AR, Sanders ME, Lovly CM, Frederick DT, Kelley MC, **Irish JM**, Shyr Y, Sullivan RJ, Puzanov I, Sosman JA, Balko JM. Melanoma-specific MHC-II expression represents a tumour-autonomous phenotype and predicts response to anti-PD-1/PD-L1 therapy. **Nature Communications** 2016 *in press*.

Complete List of Published Work in MyNCBI Bibliography (28 manuscripts)

http://www.ncbi.nlm.nih.gov/sites/myncbi/jonathan.irish.1/bibliography/44179499/public/?sort=date&direction=ascending

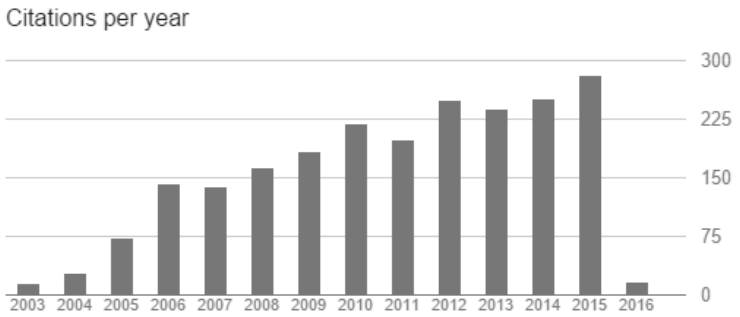
ORC ID (43 works)

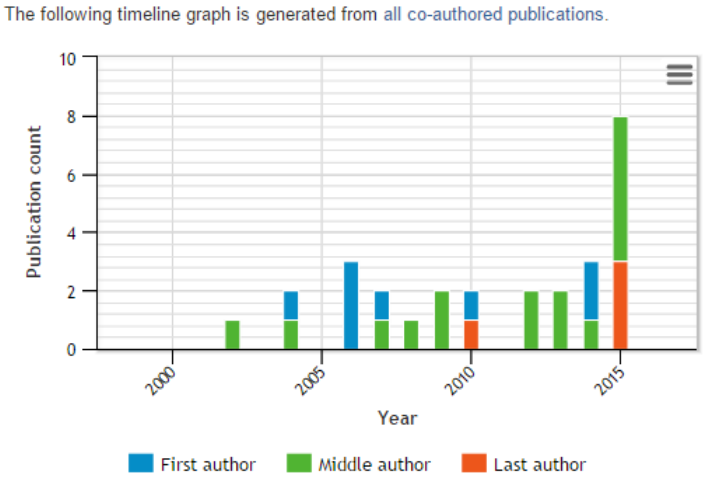
orcid.org/0000-0001-9428-8866

Google Scholar Profile for Jonathan Irish (69 entries, h-index: 15)

https://scholar.google.com/citations?user=-IJndUMAAAAJ&hl=en

Citation indices	All	Since 2011
Citations	2236	1231
h-index	15	15
i10-index	20	19





Grad School: 1998 – 2004 | Postdoc & Instructor: 2004 – 2011 | Assistant Professor: 2012 – current

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Updated January 2016