Nicholas Ingolia

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Positions

Assistant Professor 2014 - present
UC Berkeley, Dept. of Molecular and Cell Biology

Staff Member 2010 - 2013
Carnegie Institution, Dept. of Embryology

Adjunct Assistant Professor 2010 - 2013
Johns Hopkins University, Dept. of Biology
Johns Hopkins Medical Institute, Dept. of Molecular Biology and Genetics

Education

University of California, San Francisco Postdoctoral fellow

Harvard University Ph.D., Biology, 2006
Thesis: Bistability and positive feedback in genetic networks

Massachusetts Institute of Technology S.B., Biology, 2000
S.B., Mathematics, 2000

Research Experience

University of California, San Francisco 2006 - 2010
Postdoctoral Fellow, Dept. of Cellular and Molecular Pharmacology
Advisor: Jonathan Weissman

Harvard University 2000 - 2006
Graduate student researcher, Dept. of Molecular and Cellular Biology
Advisor: Andrew Murray

Massachusetts Institute of Technology 1997 - 2000
Undergraduate student researcher, Laboratory for Computer Science
Advisor: Bonnie Berger
Undergraduate student researcher, Department of Biology
Advisor: Leonard Guarente

Fellowships and Honors

NIH Director's New Innovator Award (2015)
Damon Runyon-Rachleff Innovator (2015)
Searle Scholar (2011)
NIH NRSA postdoctoral fellowship (2007 - 2009; F32GM080853)
Howard Hughes Medical Institute predoc fellowship (2000 - 2006)
NSF graduate research fellowship (declined)

Research Publications

Werner A, Iwasaki S, McGourty C, Medina-Ruiz S, Teerikorpi N, Fedrigo I, **Ingolia NT**, Rape M. Cell fate determination by ubiquitin-dependent regulation of translation. *Nature*, in press.

Sen ND, Zhou F, **Ingolia NT**, Hinnebusch AG. Genome-wide analysis of translational efficiency reveals distinct but overlapping functions of yeast DEAD-box RNA helicases Ded1 and eIF4A. *Genome Res* advance online (2015).

Research Publications (continued)

Sidrauski C, McGeachy AM, **Ingolia NT**, Walter P. The small molecule ISRIB reverses the effects of eIF2α phosphorylation on translation and stress granule assembly. *Elife* 4 (2015).

Pop C, Rouskin S, **Ingolia NT**, Han L, Phizicky EM, Weissman JS, Koller D. Causal signals between codon bias, mRNA structure, and the efficiency of translation and elongation. *Mol Syst Biol* 10: 770 (2014).

Yoon JH, De S, Srikantan S, Abdelmohsen K, Grammatikakis I, Kim J, Kim KM, Noh JH, White EJ, Martindale JL, Yang X, Kang MJ, Wood WH 3rd, Noren Hooten N, Evans MK, Becker KG, Tripathi V, Prasanth KV, Wilson GM, Tuschl T, **Ingolia NT**, Hafner M, Gorospe M. PAR-CLIP analysis uncovers AUF1 impact on target RNA fate and genome integrity. *Nat Commun* 5: 5248 (2014).

Jensen BC, Ramasamy G, Vasconcelos EJ, **Ingolia NT**, Myler PJ, Parsons M. Extensive stage-regulation of translation revealed by ribosome profiling of Trypanosoma brucei. *BMC Genomics* 15: 199 (2014).

Ingolia NT, Brar GA, Stern-Ginossar N, Harris MS, Talhouarne GJS, Jackson SE, Wills MR, Weissman JS. Ribosome profiling reveals pervasive translation outside of annotated protein-coding genes. *Cell Reports* 8: 1365 (2014).

Castañeda J, Genzor P, van der Heijden GW, Sarkeshik A, Yates JR, **Ingolia NT**, Bortvin A. Reduced pachytene piRNAs and translation underlie spermiogenic arrest in Maelstrom mutant mice. *EMBO J* 33: 1999 (2014).

Brubaker SW, Gauthier AE, Mills EW, **Ingolia NT**, Kagan JC. A Bicistronic MAVS Transcript Highlights a Class of Truncated Variants in Antiviral Immunity. *Cell* 156: 800 (2014).

Toyama BH, Savas JN, Park SK, Harris MS, **Ingolia NT**, Yates JR, Hetzer MW. Identification of long-lived proteins reveals exceptional stability of essential cellular structures. *Cell* 154: 971 (2013).

Guttman M, Russell P, **Ingolia NT**, Weissman JS, Lander ES. Ribosome profiling provides evidence that large noncoding RNAs do not encode proteins. *Cell* 154: 240 (2013).

Thorburn RR, Gonzalez C, Brar GA, Christen S, Carlile TM, **Ingolia NT**, Sauer U, Weissman JS, Amon A. Aneuploid yeast strains exhibit defects in cell growth and passage through START. *Mol Biol Cell* advance online (2013).

Nakatsu F, Baskin JM, Chung J, Tanner LB, Shui G, Lee SY, Pirruccello M, Hao M, **Ingolia NT**, Wenk MR, De Camilli P. PtdIns4P synthesis by PI4KIIIα at the plasma membrane and its impact on plasma membrane identity. *J Cell Biol* 199: 1003 (2012).

Research Publications (continued)

Stern-Ginossar N, Weisburd B, Michalski A, Le VT, Hein MY, Huang SX, Ma M, Shen B, Qian SB, Hengel H, Mann M, **Ingolia NT**, Weissman JS. Decoding human cytomegalovirus. *Science* 338: 1088 (2012).

Ingolia NT†, Brar GA, Rouskin S, McGeachy AM, Weissman JS. The ribosome profiling strategy for monitoring translation in vivo by deep sequencing of ribosome-protected mRNA fragments. *Nature Protocols* 7: 1534 (2012).

Michel AM, Roy Choudhury K, Firth AE, **Ingolia NT**, Atkins JF, Baranov PV. Observation of dually decoded regions of the human genome using ribosome profiling data. *Genome Res* 22: 2219 (2012).

Hsieh AC, Liu Y, Edlind MP, **Ingolia NT**, Janes MR, Sher A, Shi EY, Stumpf CR, Christensen C, Bonham MJ, Wang S, Ren P, Martin M, Jessen K, Feldman ME, Weissman JS, Shokat KM, Rommel C, Ruggero D. The translational landscape of mTOR signalling steers cancer initiation and metastasis. *Nature* 485: 55 (2012).

Brar GA, Yassour M, Friedman N, Regev A, **Ingolia NT**†, Weissman JS. High-Resolution View of the Yeast Meiotic Program Revealed by Ribosome Profiling. *Science* 335: 552 (2012).

Ingolia NT†, Lareau LF, Weissman JS. Ribosome Profiling of Mouse Embryonic Stem Cells Reveals the Complexity and Dynamics of Mammalian Proteomes. *Cell* 147: 789 (2011).

Gracheva EO, Cordero-Morales JF, Gonzalez-Carcacia JA, **Ingolia NT**†, Manno C, Aranguren CI, Weissman JS, Julius D. Ganglion-specific splicing of TRPV1 underlies infrared sensation in vampire bats. *Nature* 476: 88 (2011).

Takacs JE, Neary TB, **Ingolia NT**, Saini AK, Martin-Marcos P, Pelletier J, Hinnebusch AG, Lorsch JR. Identification of compounds that decrease the fidelity of start codon recognition by the eukaryotic translational machinery. *RNA* 17: 439 (2011).

Guo H, **Ingolia NT**, Weissman JS, Bartel DP. Mammalian microRNAs predominantly act to decrease target mRNA levels. *Nature* 466: 835 (2010).

Gracheva EO*, **Ingolia NT***, Kelly YM, Cordero-Morales JF, Hollopeter G, Chesler AT, Sánchez EE, Perez JC, Weissman JS, Julius D. Molecular basis of infrared detection by snakes. *Nature* 464: 1006 (2010).

Bassik MC, Lebbink RJ, Churchman LS, **Ingolia NT**, Patena W, LeProust EM, Schuldiner M, Weissman JS, McManus MT. Rapid creation and quantitative monitoring of high coverage shRNA libraries. *Nature Methods* 6: 443 (2009).

Ingolia NT†, Ghaemmaghami S, Newman JR, Weissman JS. Genome-wide analysis in vivo of translation with nucleotide resolution using ribosome profiling. *Science* 324: 218 (2009).

Research Publications (continued)

Ingolia NT, Murray AW. Positive-feedback loops as a flexible biological module. *Curr Biol* 17: 668 (2007).

Ingolia NT†. Topology and robustness in the Drosophila segment polarity network. *PLoS Biol.* 2: e123 (2004).

* denotes equal contribution; † denotes corresponding authorship

Reviews

Ingolia NT. Ribosome profiling: new views of translation, from single codons to genome scale. *Nat Rev Genet* 15: 205 (2014).

Ingolia NT. Many Paths to the Same End: Histone Transcripts Recruit Canonical Initiation Factors through Unconventional Interactions. *Mol Cell* 41: 133 (2011).

Fordyce P, **Ingolia N**. Integrating systems biology data to yield functional genomics insights. *Genome Biol* 12: 302 (2011).

Ingolia NT. Genome-wide translational profiling by ribosome footprinting. *Methods Enzymol* 470: 119 (2010).

Ingolia NT, Weissman JS. Systems biology: Reverse engineering the cell. *Nature* 454: 1059 (2008).

Ingolia NT, Murray AW. The ups and downs of modeling the cell cycle. *Curr Biol* 14: R771 (2004).

Ingolia NT, Murray AW. Signal transduction. History matters. *Science* 297: 948 (2002).

Talks

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." FEBS Congress, Berlin, Germany. July 2015.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Frontiers in Biology, Stanford University, Stanford, CA. June 2015.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Biochemistry seminar series, University of Wisconsin, Madison, WI. March 2015.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Biochemistry seminar series, student invited speaker, University of California, Los Angeles, Los Angeles, CA. January 2015.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Translation UK, Leicester, UK. July 2014.

"Genome-wide Translational Profiling." 9th FASEB Meeting on Post-transcriptional Control of Gene Expression, Big Sky, MT. July 2014.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Sloan Kettering Department of Cancer Biology and Genetics and Weill Cornell Department of Physiology and Biophysics, New York, NY. May 2014.

"Exploring Translation Outside of Canonical Protein Coding Region with Ribosome Profiling." Keystone Symposium on Long Noncoding RNAs, Santa Fe, NM. March 2014.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Institute of Molecular Biology, University of Oregon. November 2013.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Pirbright Institute, Pirbright, UK. June 2013."Genome-wide Profiling of Translation Initiation and Protein Synthesis." RNA Biology Annual Symposium, The Ohio State University, Columbus, OH. May 2013.

"The Ribosome Profiling Approach for Genome-wide Measurement of Protein Synthesis." AACR meeting, Washington, D.C. April 2013.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Biology, Columbia University, New York, NY. February 2013.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Biochemistry and Molecular Biology, Thomas Jefferson University, Philadelphia, PA. December 2012."Genome-wide Profiling of Translation Initiation and Protein Synthesis." Current Biology Seminar, Fred Hutchinson Cancer Research Center, Seattle, WA. November 2012.

Talks
(continued)

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Seattle BioMed, Seattle, WA. November 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Biochemistry and Biophysics Center, NHLBI, National Institutes of Health, Bethesda, MD. October 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Biology, Wesleyan University, Wesleyan, CT. September 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Meeting on RNA Sciences in Cell and Developmental Biology, RIKEN Center for Developmental Biology, Kobe, Japan. June 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Cell Biology and Molecular Genetics, University of Maryland, College Park, MD. April 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Center for RNA Molecular Biology, Case Western Reserve University, Cleveland, OH. March 2012.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Cell Biology, Albert Einstein College of Medicine, Bronx, NY. February 2011.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Department of Genetics, North Carolina State University, Raleigh, NC. October 2011.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." International Institute of Molecular and Cell Biology, Warsaw, Poland. September 2011.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Bioinformatics Seminar Series, University of Iowa, Iowa City, IA. April 2011."Genome-wide Profiling of Translation Initiation and Protein Synthesis." CSH Asia Conference on High Throughput Biology, Suzhou, China. April 2011.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." NICHD, National Institutes of Health, Bethesda, MD. April 2011.

"Genome-wide Profiling of Translation Initiation and Protein Synthesis." Computational Biology and Genomics seminar, University of Maryland, College Park, MD. December 2010.

"Genome-Wide Translational Profiling by Ribosome Footprinting." Annual Meeting of the Oligonucleotide Theraputics Society, Dana Point, CA. October 2010.

"Genome-Wide Profiling of Translation Initiation and Elongation." Frontiers in Quantitative Biology, Stanford University School of Medicine, Palo Alto, CA. September 2010.

Talks (continued)

"Genome-Wide Translational Profiling by Ribosome Footprinting." Department of Human Genetics seminar, University of Utah, Salt Lake City, UT. May 2010.

"Genome-wide analysis of in vivo translation with single-nucleotide resolution." Lorne Genome, Lorne, Australia. February 2010.

"Genome-wide translational profiling of the eIF2α-mediated stress response with single-nucleotide precision." ASCB Annual Meeting, San Diego, CA. December 2009.

"Genome-wide analysis of in vivo translation with single-nucleotide resolution." EMBO Conference on Protein Synthesis and Translational Control, Heidelberg, Germany. September 2009.

"Genome-wide analysis of in vivo translation with single-nucleotide resolution using ribosome profiling." RNA Society Meeting, Madison, WI. May 2009.

"Robustness in Drosophila segment polarity" Complex Biomolecular Networks: Structure, Evolution, and Function, Montauk, NY. September 2005.

"Topology and robustness in the Drosophila segment polarity network." March Meeting of the American Physical Society, Los Angeles, CA. March 2005.

"Topology and robustness in the Drosophila segment polarity network." KITP Microprogram on Networks in Growth, Death, and Aging, Santa Barbara, CA. February 2005.

"Robustness in Drosophila segment polarity." New York Academy of Science Systems Biology Discussion Group, New York, NY. November 2004.

Teaching Experience

University of California, Berkeley
Survey of the Principles of Biochem & Mol Biol 2015

Johns Hopkins University
Critical Thinking in Biology 2011 - 2012

Marine Biological Laboratory
Physiology, Teaching Assistant 2008

Harvard University
Head Teaching Asst., Genomics and Systems Biology 2003
Teaching Assistant, Intro Molecular Biology 2002
Teaching Assistant, Genomics and Systems Biology 2002

Professional Service

Editorial Board, *Genome Research* 2014 - present

Reviewer for: Nature, Science, Cell, eLife, Nature Reviews Genetics, Molecular Cell, Journal of Cell Biology, Genome Research, PLoS Biology, PNAS, Genome Biology, Molecular Systems Biology, PLoS Genetics, Cell Reports,

Professional Service (continued)

Reviewer for (continued): ACS Chemical Biology, RNA, Science Signaling, Molecular and Cellular Proteomics, Nucleic Acids Research, Translation, Genome Biology and Evolution, PLoS Computational Biology, Proteomics, Nature Communications, PLoS One, BMC Systems Biology, Genetics, Physiological Genomics, Computing in Science and Engineering

Ad hoc reviewer for: Israeli Science foundation (ISF), Biotechnology and Biological Sciences Research Council (BBSRC), Binational Agriculture Research and Development Fund (BARD), Research Foundation Flanders (FWO), French National Research Agency (ANR)

Grant Support

Searle Scholars Program 07/2011-06/2015 3.0 Cal Mo.
Kinship Foundation $100,000 / year (direct)
Regulated Changes in Translation Initiation: Molecular Causes and Genome-wide Consequences

1 R21 ES22575-01A1 07/2013-06/2016 0.5 Cal Mo.
NIH/NIEHS $136,324 / year (direct)
Environmental and Programmed Regulation of Start Codon Recognition

Rose Hills Innovator 07/2014-06/2017 N/A
UC Berkeley, VC Research $45,000 / year (direct)
Mechanistic Basis of Post-Transcriptional Control of Gene Expression

1 DP2 CA195768-01 09/2014-08/2019 N/A
NIH/OD $1,500,000 (direct)
Molecular Basis and Cellular Roles of Translational Regulation

DR-Rachleff Innovator 01/2015-12/2016 N/A
Damon Runyon Cancer Res Found $150,000 / year (direct)
Cis-regulatory code for the translational control of gene expression