Updated 3/10/2010

CURRICULUM VITAE

ROBERT H. SINGER, Ph.D

PLACE OF BIRTH: Boston, Massachusetts

EDUCATION:

1966	Oberlin College, Oberlin, Ohio BS in Physical Chemistry
1970	Brandeis University, Waltham, Mass. Ph.D. in Developmental Biology Edgar Zwilling, Advisor

POSITIONS HELD:

1970 - 1973	Research Associate in Molecular Biology Massachusetts Institute of Technology Cambridge, Massachusetts with Sheldon Penman.
1973 - 1974	Visiting Scientist in Cell Biology Weizmann Institute of Science Rehovot, Israel, David Yaffe, Sponsor.
1974 - 1977	Assistant Professor of Anatomy University of Massachusetts Medical School Worcester, Massachusetts
1977 - 1989	Associate Professor of Anatomy University of Massachusetts Medical School Worcester, Massachusetts (Primary Appointment, Tenured 1986).
1984	Visiting Associate Professor of Anatomy Harvard Medical School Boston, Massachusetts
1985 - 1989	Associate Professor of Molecular Genetics and Microbiology University of Massachusetts Medical School Worcester, Massachusetts (Secondary Appointment)
1989 - 1996	Professor of Cell Biology Molecular Genetics and Microbiology University of Massachusetts Medical School Worcester, Massachusetts (Department name was changed to "Cell Biology" in 1988).

1996 - Present	Professor Department of Anatomy & Structural Biology Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461
1996 - Present	Professor Department of Cell Biology Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461 (Secondary Appointment)
2001-2002	Acting Co-Chairman Department of Anatomy & Structural Biology Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461
2002-Present	Co-Chairman Department of Anatomy & Structural Biology Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461
2003-Present	Co-Director Gruss-Lipper Biophotonics Center Department of Anatomy & Structural Biology Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461
2006-Present	Professor Department of Neuroscience Albert Einstein College of Medicine 1300 Morris Park Avenue Bronx, NY 10461 (Secondary Appointment)

FELLOWSHIPS AND AWARDS

1963	NSF - Undergraduate Research Summer Fellowship Western-Reserve University
1964	NSF - Undergraduate Research Summer Fellowship Western-Reserve University
1968-70	NIH Graduate Fellowship (training grant) Brandeis University
1970-72	Damon Runyon Postdoctoral Fellowship
1973	American Cancer Society Fellowship

1973-74	Muscular Dystrophy Association Fellowship
1978-83	Research Career Development Award Neuromuscular Disease and Stroke Institute National Institutes of Health
1988	Massachusetts Center for Excellence Award for the contribution to the development of biotechnology in Massachusetts. Awarded by Governor Dukakis.
1992-98	Ad Hoc Member, Molecular Cytology Study Section.
1998-2002	Permanent Member, Molecular Cytology Study Section.
1999	Recipient of First Annual Faculty Research Achievement Award Albert Einstein College of Medicine
2009	Elected Fellow to the American Academy of Arts and Sciences
1989-2004	Patent Awards: 4,888,278 "In situ hybridization to detect nucleic acid sequences in morphologically intact cells" 5,523,204 "Detection of nucleic acids in cells by strand displacement amplification" 5,641,675 "Cis acting RNA sequences as targets for therapeutic agents" 5,728,527 "Detection of hybridized oligonucleotide probes in living cells" 5,866,331 "Single molecule detection using oligonucleotides" 5,827,660 "Caged fluorochrome-labeled probes and subtraction of autofluorescence background. 5,962,332 "Detection of Trinucleotide Repeats by in situ hybridization" 5,985,549 "Non-Isotopic in-situ hybridization method for detection of nucleic acids" 6,203,986 B1 "Visualization of RNA in living cells" 6,242,184 B1 "In-situ hybridization of single-copy and multiple-copy nucleic acid sequences" 6,586,240 "Visualization of RNA in living cells". 6,534,266 Assay of gene expression patterns by multi-fluor fish

PROFESSIONAL SOCIETIES:

American Association of Anatomists
American Association for the Advancement of Science
American Association for Cancer Research
American Society for Cell Biology
Association of Anatomy, Cell Biology & Neurobiology Chairpersons
Molecular Medicine Society
New York Academy of Sciences
New York Society of Experimental Microscopists – *President* 2001
RNA Society
Society for Developmental Biology
Society for Molecular Imaging

The Harvey Society – Board Member, *Secretary 2001-2006*
FASEB – Co-organizer of semiannual meeting: RNA transport and localization 1994-
American Society of Nephrology
Biophysical Society
American Academy of Arts & Sciences

EDITORIAL BOARDS

Monitoring Editor, PNAS
Associate Editor, RNA
Editorial Board, J. Cellular Biochemistry
Reviewer for Cell, Science, Nature, J. Cell Biology, J. Biophysics, Nature Methods, PNAS
Editorial Board Transcription

SCIENTIFIC ADVISORY BOARDS (Served on)

Scientific Advisory Board of the Carnegie Mellon College of Science.
Scientific Advisor, Amersham Biosciences, Piscataway, NJ.
Scientific Advisory Board of Genome Canada, Montreal, Canada.
Scientific Due Diligence for Joel Adams, by Advance Capital Management
Workshop for HHMI for Janelia Farm
Scientific Advisory Board for the Center of Excellence in Genomic Science, Columbia University
EURASNET Scientific Advisory Board (European Union Funding Council)
European Science Foundation – Scientific Advisor
Aureon Laboratories – Scientific Board

MEETING ORGANIZER

First FASEB Meeting on RNA Localization (every other year) 1994-
EMBO RNA Meeting, RNA Control of Neuronal Function, 2005
First Annual AECOM-Weizmann Meeting, 2004
Second Annual AECOM-Weizmann Meeting, 2005
EMBO Workshop, 2005
PITTCON, 2006
Imaging of Transcription - Janelia

CURRENT GRANT FUNDING

ACTIVE:

NIH/NIBIB 5R01EB002060-25 / Singer, P.I. 06/01/84-05/31/09
"Single RNA Molecule Movement Visualized in Living Cells"
The major goals of this project are to develop probes to visualize single nucleic acid molecules in living cells.

NIH/NIGMS 5R01GM57071-10 / Singer, P.I. 01/01/98-03/31/11
"RNA Transport and Localization in Yeast in Situ"

The focus of this proposal is to apply technological advances in the use of oligonucleotide probes for in situ hybridization and the analysis of images acquired by digital microscopy to study the mechanism of intracellular trafficking, localization and spatial organization of *ASH1* (and other) mRNAs within *S. cerevisiae*.

NIH/NIGMS 1R01GM080247-02 / Singer, P.I. 09/28/07-08/31/11
"Probes for Multiplexing Single RNA Molecule Detection in Living Cells"
The goal of this proposal is to use DNA probes to detect RNA in living mammalian cells.

NIH/NIGMS 2R01GM084364-15A1 / Singer, P.I. 03/03/92-07/31/12
"Mechanism of Actin mRNA Localization"
The major goals of this project are to isolate cis-acting sequences and trans-acting factors which are involved in the mechanism of actin mRNA localization in chick embryo fibroblasts.

NIH/NIGMS 1R01GM086217-01 / Singer, P.I. 09/30/08-07/31/12
"Light-Activated Gene Expression in Single Cells within Tissue"
The goal of this proposal is to provide a method for activating gene expression within living tissues using light. This proposal involves four laboratories.

NIH 1R01CA114265-04 / Augenlicht, P.I. *(Singer Co-P.I.)* 05/01/05-04/30/10
"Nutritional Mechanisms and Intestinal Tumorigenesis"
The purpose is to investigate the role of a high fiber diet on gene expression patterns in normal colon.

NIH 2R01EB000312 / Weiss, S., P.I. *(Singer Co-P.I.)* 08/01/06-07/31/11
"Multiplexing Nanoparticles for Detecting Transcription Sites in Tumor Cells"
Subcontract with UCLA, California
(Postdoc salary support only)

NIH/NCI 2PO1CA100324-07 / Condeelis, P.I. 06/01/03-05/31/13
Program Project Grant; "Motility and Invasion"
Core Component A: *(Singer, Co-Core Director)* "Intravital Imaging Core"
This Program Project is focused on understanding the molecular basis for paracrine interactions between macrophages and carcinoma cells. It represents a unique perspective on invasion and metastasis that has the potential for generating broad new insights into the microenvironments of the primary tumor.

TEACHING ACTIVITIES:

1974 - 1986	Human Gross Anatomy (Medical) (UMASS)
1983 - 1986	Course Co-Coordinator (UMASS)
1974 - 1980	Histology (Medical) (UMASS)
1980 - 1996	Coordinator and Originator of the Graduate Cell Biology Course (UMASS)
1980 - 1996	Coordinator and Originator of the

	Advanced Topics in Cell Biology Course (UMASS)
1998 - present	Molecular Cell Biology (AECOM)
2005	Course in the Responsible Conduct of Research (AECOM)

ADMINISTRATIVE POSITIONS HELD:

At UMASS:

Graduate School of Medical Sciences: Founder and Member of the Council: Set up graduate school requirements, administrative structure and policy - 1975-1985.

Department Graduate Director - oversaw the recruitment of prospective graduate students for the department, the coursework of all graduate students, all qualifying exams, research advisory committee and thesis exams. There were twenty graduate students in the department. Also was responsible for the semiannual publication of the department research brochure.

Scientific Council: Founder and Member - oversaw all expenditures of indirect cost reimbursements - 1975-1985.

Patent Committee Member: Reviewed internal applications for potential patent applications.

Co-Director: Nucleic Acid Facility and founder of the DNA Synthesis Facility 1987. The Facility operated as a business and was profitable until 1995 when it ceased operations, supplying custom oligonucleotides as a finished product to members of the institution and customers outside the institution. Also supplied were services such as plasmids, restriction analysis and PCR. Gross was over $85,000 per year. There were two employees.

Search Committees served on: Chairman of Biochemistry, Chairman of Microbiology, Chancellor of the Medical Center. Faculty recruitment for the Department (hired 5 faculty plus Chairman since 1987).

At AECOM:

Medical Scientist Training Program (MSTP) Admissions Committee
Committee on Patents
Division of Research
Cell Biology Search Committee
Ad Hoc Promotions Committee
Graduate Advisory Committee and Thesis Committee for Students
Chair, Subcommittee to review Office of Industrial Liaison (OIL)
Writer's Workshop
Center for Genetic & Translational Medicine Planning Committee
Committee on Awards
Basic Science Chairmen's Committee
Dean's Chairmen's Committee
AIF Advisory Committee
Anatomy Graduate Committee
Anatomy Training Grant Mentor
Information Technology Committee

Biophotonics Search Committee
Co-Director Innovation Laboratory and Biophotonics Center
AECOM Tenure Committee
Computation & Systems Biology Committee
Gruss Lipper Biophotonics Center Executive Committee

BIOTECHNOLOGY:

A founder, director and board member until (1992) of Applied Biotechnology Inc., a company in Cambridge, Massachusetts specializing in vaccine development, and cancer diagnostics and therapeutics. Employed 60. Merged in 1992 with Oncogene Sciences Inc. Advisor for the product development (including quality assurance and beta-site clinical trials) of the HIV detection kit "InSite™, taken over by Becton-Dickinson.

Scientific Advisory Board of Becton-Dickinson.

Scientific Advisory Board, Exact Sciences (a colon cancer diagnostic company), 1995-1999.

A Scientific founder of Aureon Biosciences, 2001, a company based in Yonkers, NY, dedicated to development of molecular diagnostic reagents for pathology.

PTC Therapeutics. Scientific Advisory Board 2006.

PRE-DOCTORAL TRAINING:

1985	Barry Oblas (Ph.D., Clark University) Department of Microbiology, Arizona State University
1986 - 1992	Gary Bassell (Ph.D., UMASS) Associate Professor, Department of Cell Biology, Emory University School of Medicine
1993-99	Vaughan Latham , Predoctoral Fellow, AECOM Ph.D. Awarded June, 1999. Medical Oncology, Associate at Dana Farber Institute
1993-99	Andrea Femino, Predoctoral Fellow, UMASS Instructor, AECOM
2002	Yuri Oleynikov, MD/Ph.D., AECOM Ph.D. Awarded June, 1999. MD AECOM 2001, Fellowship UCLA Ophthalmology
1994-98	Mirian Pereira (Ph.D., Brazil, Thesis at AECOM) Fundacao Oswaldo Cruz, Rio de Janero, Brazil.

1997-98	Matthias Schaefer, Predoctoral Fellow, AECOM and Research Institute Molecular Pathology, Vienna, Austria German Cancer Research Fellow, Heidelberg
1998-2004	Feng Pan, Predoctoral Fellow, AECOM, Ph.D. Awarded December, 2004, Postdoctoral Fellow, Skirball Institute, NYU
1998	Marina Dorokhov, Rotation Student, AECOM
1998-2004	Dahleen Fusco, MD/PhD., AECOM, Awarded June, 2004 – Fellow At Aaron Diamond Research Center, Rockefeller University with David Ho
1998	Adriana Herskowitz, MSTP Rotation Student, AECOM
1999	Nicole Rempel, Rotation Student, AECOM
2000-2004	Jeff Levsky, MD/PhD, AECOM Awarded June, 2004 - Fellow in Radiology, Montefiore Hospital
1998-2003	Kim Farina, PhD, AECOM, Awarded June, 2003 - Assistant Professor, Allied Health Sciences at Baylor College of Medicine
1999-2001	Amy Kurland, MD, AECOM – Awarded June, 1998 – Part-Time Lecturer, Camden Law School, Rutgers University
1999-2000	Roger Greenberg, MD/Ph.D., AECOM – Awarded June 1999, Assistant Professor, Cancer Biology, Abramson Family Cancer Research Institute, PA
2000-2007	Kyle Lapidus, MSTP, AECOM – PhD awarded December 2007, Psychiatry Resident, Mt. Sinai School of Medicine, NY
2000-2008	Erin Powrie, Graduate Student, AECOM – PhD awarded June 2008, Postdoctoral Fellow, Brown University
2000	Meir Scheinfeld, MSTP Rotation Student, AECOM
2001	Dennis Madrid, MSTP Rotation Student, AECOM
2000	Jessica Curtis, Rotation Student, AECOM
2000	Jessie King, Rotation Student, AECOM
2000	Binzhi Qian, Rotation Student, AECOM
2003	Ji Li, MSTP Rotation Student, AECOM

2003-2007	Yingfeng Deng, Graduate Student, AECOM - PhD. Awarded June, 2008, Postdoctoral Fellow, The University of Texas MD Anderson Cancer Center
2004-2007	Rossanna Pezo, MSTP, AECOM – PhD awarded October, 2007, Resident, University of Toronto
2005	Ines Petersen, Rotation Student, AECOM
2006	Deborah Russel, Rotation Student, AECOM
2006-2009	Saumil Gandhi, MSTP Student, AECOM
2009	Rune Thomsen, PhD Student, University of Aarhus, Denmark
2005-Pres.	Tatjana Treck, Graduate Student, AECOM
2008-Pres.	Zachary Katz, Graduate Student, AECOM
2008-Pres.	Adina Buxbaun, Graduate Student, AECOM
2008-Pres.	Sami Hocine, Graduate Student, AECOM
2009-Pres.	Vivek Patel, MSTP Student, AECOM
2010-Pres.	Christoph Fritzsch, PhD Student, Eberhard Karls University, Tübingen, Germany

POSTDOCTORAL TRAINING:

1975 - 1979	Helena Huang (Ph.D., Harvard)
1977 - 1979	Jonathan Kabat-Zinn (Ph.D., MIT) Associate Professor of Medicine University of Massachusetts Medical School Author of books on Zen Meditation
1978 - 1982	Jeffrey A. Pudney (Ph.D., King's College London) Associate Research Professor, Harvard School of Public Health
1982 - 1987	Jeanne B. Lawrence (Ph.D. Brown University) Tenured Professor of Cell, Biology, University of Massachusetts Medical School
1986 - 1987	Fred Silva (M.D. Columbia) Executive Director, American and Canadian Institute of Pathology

1987 - 1988	Rafaat Bashir (M.D., American University, Beirut) Associate Professor of Neurology, University of Nebraska
1987 - 1991	Cynthia Sundell (Ph.D., University of Pennsylvania) Senior Scientist, Aprogenics, Inc., Atlanta, GA.
1992 - 1996	Edward Kislauskis (Ph.D., UMASS) Assistant Professor, Department of Pathology University of Massachusetts Medical School, Vice-President and Co-Founder of Biomedical Research Models, Inc.
1992-1996	Anthony A. Ross, Jr. (Ph.D., S.U.N.Y., Stony Brook) Associate Dean University of Connecticut, Bridgeport
1993-1998	Roy A. Long (Ph.D., Penn State) Associate Professor, Department of Molecular Genetics Medical College of Wisconsin. Pew Scholar
1992-1997	Joan Politz (Ph.D., University of CA, Santa Cruz) Instructor, UMASS Medical School University of Massachusetts
1995-1998	Marina Chicurel (Ph.D., Harvard) Free-Lance Writer, Santa Cruz, CA
1994-1999	Brigitte Lavoie (Ph.D., Universite Laval School of Medicine, Canada) Senior Scientist - Fogarty Fellow NINDS/NIH, Washington, DC
1996-1998	Edouard Bertrand (Ph.D. Institut J. Monod-Université, France) Staff Scientist, Institute de Genetique Molec. de Montpellier, CNRS, France, Winner of the CNRS Bronze Medal 1999 (Most Outstanding Young Investigator).
1997	Hali Wang (Ph.D., Peking University, Beijing, PRC) Staff Scientist, Verigen, Scottsdale, Arizona
1997-1999	Elena Shestakova, (Ph.D., Institute Protein Research, Russian Acadeny of Science) Associate – Department of Cancer Biology, Dana-Farber Institute
1997-2000	Gang Liu, Postdoctoral Fellow, AECOM Joint with Dr. John Condeelis. Associate Professor, Albany Medical College
1996-2001	Pascal Chartrand (Ph.D. University of Montreal,

	Canada) Associate Professor Biochemistry, University of Montreal
2001-2004	Stefan Huettelmaier, (Ph.D., Univ. of Braunschweig, Germany), Harry Eagle Award Scholar, AECOM, Medical Faculty University of Halle-Wittenberg, Germany
2001-2005	Mike Lorenz, (Ph.D., Institute of Molecular Biotechnology, Jena, Germany), Director of Microscopy, Max-Planck Institute, Dresden Germany
2003-2005	Jonathan Chubb, (Ph.D., University College, London) Lecturer, Wellcome Trust, Dundee, Scotland
2002-2005	Yaron Shav-Tal, (Ph.D., Weizmann Institute of Science, Rehovot, Israel), Assistant Professor at Bar-Ilan University, Ramat Gan, Israel
2002-2005	Xavier Darzacq, (Ph.D., Universite Paul Sabatier, Toulouse, France) Group Leader at Ecole Normale Superiore, Paris, France
2000-2007	Jason Dictenberg, (Ph.D., UMASS), Einstein Scholar Postdoctoral Award AECOM, Assistant Professor, Hunter College, CUNY
2002-2008	Alex Rodriguez, (Ph.D., Rutgers, The State University of New Jersey, Newark, NJ), Assistant Professor, Rutgers University
2005-2008	Kevin Czaplinski, (Ph.D., University of Medicine & Dentistry of NJ/Robert Wood Johnson Medical School, NJ) Assistant Professor, Stony Brook, SUNY
1996-2009	Wei Gu, (MD/Ph.D, 1996 Shanghai Medical School; Tufts University, MA), Professor, Shantou University Medical School, Shantou, China
2003-2009	Daniel Zenklusen, (Ph.D., University of Lausanne, Lausanne, Switzerland), Assistant Professor, University of Montreal, Canada
2006-2009	David Gruenwald, (Ph.D., Ludwig Maximilian Universität München, Germany), Assistant Professor, Delft University of Technology, The Netherlands
2003-Pres.	Amber Wells, (Ph.D., Univ. of Pennsylvania, Philadelphia, PA)
2004-Pres.	Daniel Larson, (Ph.D., Cornell University, Ithaca, NY) Einstein Scholar Postdoctoral Award AECOM
2005-Pres.	Jeffrey Chao, (Ph.D., The Scripps Research Institute, LaJolla, CA)

2005-Pres.	Valeria de Turris, (Ph.D., Universita' "La Sapienza" di Roma, Rome, Italy)
2007-Pres.	Timothée Lionnet, (Ph.D., Ecole Normale Supérieure, Paris, France)
2008-Pres.	Bin Wu, (Ph.D., University of Minnesota, Minneapolis, MN)
2008-Pres.	Hye Yoon Park, (Ph.D., Cornell University, Ithaca, NY)
2009-Pres.	Carolina Eliscovich, (Ph.D., CRG-Centre for Genomic Regulation, Barcelona, Spain)

SUMMARY OF RESEARCH INTERESTS:

The spatial organization of nucleic acids within cells: mechanisms of sorting and functional significance.

Detection of intracellular RNA by high resolution microscopy is a methodology to which we have been contributing over almost two decades. We developed non-isotopic FISH for RNA expression in collaboration with David Ward (*Proc. Natl. Acad. Sci. USA* 79:7331-7335, 1982), the first demonstration of RNA localization in somatic cells (*Cell* 45:407-415, 1986), detection of human single copy genes (*Cell* 52:51-61, 1988) and detection of nuclear RNA transcripts (*Cell* 57:493-502, 1989). We did the first mapping of interphase gene distances at high resolution (*Science* 249:928-932, 1990), direct demonstration of association of specific transcripts with the cytoskeleton (*Science* 253:1275-1278, 1991), FISH demonstration of cotranscriptional splicing (*Nature* 372:809-812, 1994), intracellular movement of RNA in response to extracellular signals (*J. Cell Biol.* 126:1211-1219, 1994; *Nature* 392:730-733, 1998), the first description of RNA localization in yeast (*Science* 277:383-387, 1997) and the first detection of single RNA molecules (*Science* 280:585-590, 1998). We devised a method for following a specific mRNA sequence in the cytoplasm (*Molecular Cell* 2:437-445, 1998), and the nucleus (*Current Biology* 9:333-336, 1999) of living cells. We have applied this to understanding how single mRNA molecules are synthesized and move in living cells (*Cell* 119:491-502, 2004) (*Science* 304:1797-1800, 2004). The regulation of translation in localized RNAs was characterized by the function of the transacting protein ZBP1 that binds to the RNA Zipcode (Huettelmaier, et al, *Nature* 2005). More recently we have been characterizing the kinetic components of transcription using high-resolution microscopy (Darzacq et al, *Nat. Struct. Biology*, 2007; Zenklusen et al, *Nat. Struct. Mol. Biol.* 2008). Over the years, this work has been responsible for 14 patents and patent applications. All of these approaches have a common theme: achievement of technological progress by optimizing preparation protocols, improving probe design and developing imaging software and hardware to acquire and analyze molecular information at the cellular level. We are now applying this technological expertise to living cells in real time, to analyze how single RNA molecules move within the cell and to investigate functional genomics at the cellular level by a method we call "Single cell gene expression profiling".

Our view of cellular organization now includes the concept of a functional compartmentalization of nucleic acids in the nucleus and cytoplasm. Future work will be directed toward how the cell transduces nucleic acid information into spatial information and how compartmentalization of nucleic acid facilitates gene expression and macromolecular organization and assembly.

INVITED LECTURES AT OTHER INSTITUTIONS AND SYMPOSIA (LAST FOUR YEARS)

2006

AACBNC, Annual Winter Conference, Aruba, January 18-21, 2006.

Workshop on the Nuclear Microenvironment and Cancer, Bethesda, MD, February 8-9, 2006.

Seminar, Rutgers University, Dept. of Cell Biology and Neuroscience, Piscataway, NJ, February 10, 2006.

Biophysical Society 2006 Annual Meeting, Symposium: Visualizing Molecular Function in Living Cells, Salt Lake City, February 18-22, 2006.

Pittcon, Orlando, Florida, March 12-15, 2006.

Seminar, Emory University, Atlanta, Georgia, March 17, 2006.

NIBB-EMBL Joint Mtg. "Frontiers in Bioimaging", Okazaki, Japan March 22-24, 2006.

Activities and Imaging of Regulatory RNA Networks, Heidelberg, Germany, April 5-7, 2006.

EURASNET "Network of Excellence" Meeting, Sitges, Barcelona, Spain, April 22-26, 2006.

EMBO Workshop "Functional Organization of the Cell Nucleus", Prague, Czech Republic, May 5-8, 2006.

Nuclear Organization Mini-Symposium, Jerusalem, Israel, May 9-May 14, 2006.

Symposium on New Developments in Microscopy and Imaging, Rockefeller University, New York, May 30, 2006.

Nucleic Acids Gordon Research Conference, Newport, RI, June 4-9, 2006.

Gordon Conference-"Single Molecular Approaches to Biology, Colby Sawyer College, New London, NH June 18-23, 2006.

FASEB "Post-Transcriptional Control of Gene Expression: Mechanisms of mRNA Decay" Snowmass Village, Colorado June 24-29, 2006.

German Research Foundation "Optical Analysis of Biomolecular Machines" Berlin, Germany July 13-16, 2006.
7th PI Meeting for the IMAT Program, Bethesda, MD, September 6 & 7, 2006.

Translational Control, Cold Spring Harbor, NY, September 6-10, 2006.

232nd Annual ACS Meeting-Symposium, "Frontiers in Single-Molecule Biophysical, Chemistry and Imaging", San Fransisco, CA, September 10-14, 2006.

Seminar-Research Institute Seminar Series, The Hospital for Sick Children, Toronto, Canada, October 13, 2006.

Department of Biological Sciences Fall 2006 Seminar Series, Hunter College, November 13, 2006.

EURASNET Imaging Workshop, Lisbon University, November 27-30, 2006.

2006 Grantee Workshop, Bethesda, MD, December 4-5, 2006.

ASCB Annual Meeting, San Diego, CA, December 9-13, 2006.

2007

AACBNC Annual Meeting, Puerto Vallarta, Mexico, January 17-20, 2007.

Biochemistry Seminar Series Speaker, NYU, January 31, 2007.

51st Annual Biophysical Meeting, Baltimore, MD, March 3-7, 2007.

IMAT Review Mtg., "Innovative Technologies for Molecular Analysis of Cancer", Bethesda, MD, March 7-8, 2007.

New York Academy of Science Genome Integrity Meeting, NYAS, NY, March 19, 2007.

CSHL 5th Meeting on Systems Biology, Cold Spring Harbor, NY March 29-April 1, 2007.

Department of Pharmacological Science Seminar Series, Stonybrook, NY, April 3, 2007.

University of Connecticut Health Center, Farmington CT, April 5-7, 2007.

Cornell Biophysics Colloquium, Cornell University, Ithaca, NY, April 25, 2007.

Salk Advisory Board, Lotus Club, New York, April 27, 2007.

Albert Einstein Cancer Center Advances Meeting, Glen Island Harbour Club, May 22, 2007.

Brandeis Genetics Symposium Student Invited Speaker, Brandeis University, Waltham, MA, May 30, 2007.

HHMI, Janelia Farm Research Campus, Ashburn, VA, June 3-6, 2007

Gordon Conference on Bioorganic Chemistry, Proctor Academy, Andover, NH, June 10-15, 2007.

Seminar on Investigative Medicine, The Feinstein Institute for Medical Research, June 26, 2007.

EMBO workshop on Intracellular RNA Localization & Localized Translation, Il Ciocco, Tuscany, Italy, July 1-6, 2007.

American Chemical Society 234th National Meeting & Exposition, Boston, MA, August 19-23, 2007.

EMBO Conference Series on Nuclear Structure and Dynamics, Montpellier, France, September 1-5, 2007.

Riboclub Meeting, Mt. Orford, Quebec, September 24-26, 2007.

Keynote Speaker Student Invited Speaker for Symposium on Chemical Biology, University of Kansas, Lawrence, Kansas, September 28, 2007.

2nd International Gene Center Symposium, Munich, Germany, October 12-13, 2007

Translation at the Synapse, Janelia Farm, Washington DC, October 21-25, 2007.

Seminar, Distinguished Scientist Seminar, University of Pittsburgh Cancer Institute, November 5, 2007.

Cell Biology and Physiology Seminar, University of Pittsburgh, November 6, 2007.

2007 CRG Symposium, Barcelona, Spain, November 9-10, 2007.

NCI-ICBP DCB Meeting, Washington DC, November 13, 2007.

ICGEB & EURASNET Meetings, Bariloche, Argentina, November 26-30, 2007.

NIH Imaging Probe Workshop, Atlanta, GA, December 7, 2007.

2008

2008 Keystone Symposium, Keynote Speaker, Coeur d'Alene, Idaho, January 28-February 2, 2008.

2008 Keystone Symposium, Keystone, Colorado, February 3-8, 2008

Nature Roundtable Discussion, on the Future of Single Molecule Analysis, New York, NY, February 19, 2008.

.

Public Health Research Institute-UMDNJ, New Jersey, February 26, 2008.

Cell Biology Course, Rockfeller University, New York, NY, March 5, 2008.

Pennsylvania Muscle Institute Seminar, UPENN, March 10, 2008

Abramson Family Cancer Research Institute, UPENN, March 11, 2008

RNA Granules Workshop HHMI Headquarters, Chevy Chase, MD, March 31-April 2, 2008.

ASMBM 2008 San Diego, CA, April 5-10, 2008.

Colorado State University Seminar, Student Invited Speaker Colorado State University, April 10-13, 2008.

European Science Foundation, Advisory Board Workshop, Florence, Italy, April 26-29, 2008.

EURASNET Mtg. on Alternative Splicing, Krakow, Poland, May 21-28, 2008.

RNA Quality Conference Granada, Spain, June 8-13, 2008.

CFAR Aids Club AECOM, June 20, 2008.

60th Annual Meeting of the Japan Society for Cell Biology Yokohama, Japan, June 26-July 2, 2008.

EMBL Distinguished Lecture Heidelberg, Germany, July 25, 2008.

RNA 2008 Annual Meeting Berlin, Germany, July 28-Aug. 3, 2008.

Gordon Research Conference Colby-Sawyer College, NH, August 17-22, 2008.

Seminar, University of Rochester Medical Center, September 24, 2008.

Kimmel Cancer Center Oncology Grand Rounds, Thomas Jefferson University, Philadelphia, PA
October 29, 2008.

Ann. Mtg. American Soc. of Nephrology, Pennsylvania Convention Ctr., Philadelphia, PA, November 6-9, 2008.

Seminar, Chemistry Department, Hunter College, NY, November 14, 2008.

Biochemistry Department Seminar, McGill University, Montreal, November 17, 2008.

2009

AACNBC Annual Winter Conference, Galapagos Islands, January 14th-19th, 2009.

HHMI Reviewer, Parker Lab Retreat, Tucson, Arizona, January 26th-27th, 2009.

Speaker of the Month, Weizmann Institute of Science, Rehovot, Israel, February 16, 2009.

Special Seminar, Institute for Medical Research, Hebrew University, Hadassah School of Medicine Seminar, Jerusalem, February 17th, 2009.

The Mina & Everard Goodman Faculty of Life Sciences, Special Guest Lecture, Bar-Ilan University, Ramat-Gan, Israel, February 18th, 2009.

Special Seminar, Tel Aviv University, Tel Aviv, Israel, February 22nd, 2009.

Symposium Speaker, "Monitoring RNAs: From Single-Molecules to the Cell", 53rd Annual Meeting of the Biophysical Society, Boston, MA, February, 28th-March 4th, 2009.

Invited Speaker Gordon Research Conference, "Signal Transduction Within the Nucleus" Ventura, California, March 29th-April 3rd, 2009.

Symposium Speaker, "Initiation: Dynamics of Transcription", American Society for Biochemistry and Molecular Biology 2009 Annual Meeting, New Orleans, LA, April 18th- 22nd, 2009.

Fourth Annual EURASNET Meeting, Assisi, Italy, April 23rd-24th, 2009.

Keynote Speaker at the FASEB/EMBO Research Conference, Saxtons River, VT, July 12th-17th, 2009.

Symposium Speaker at the 21st IUBMB and 12th FAOBMB International Congress of Biochemistry and Molecular Biology Meeting, Shanghai, China, August 2nd-7th, 2009.

Symposium Speaker at CSH Conference "Mechanisms of Eukaryotic Transcription", Cold Spring Harbor, NY, August 25th-August 29th, 2009.

Distinguished Scientist Lecture, Department of Cell and Developmental Biology, UNC Chapel Hill, NC, October 23rd, 2009.

Translation at the Synapse II, Janelia Conference, Janelia Farm Research Campus, November 8th-11th, 2009.

2010

AACNBC Annual Winter Conference, Curacao, Netherlands, January 20th-24th, 2010.

Janelia Farm Symposium, Speaker, Janelia Farm, Ashburn, Virginia, January 11th-13th, 2010.

NIH/NCI, Laboratory of Receptor Biology, Bethesda, MD, February 3rd, 2010.

Johns Hopkins School of Medicine, Seminar Speaker, March 10th, 2010.

Janelia Farms Meeting, "Imaging Transcription in Living Cells: A systems and Computational Approach", Session Chair, March 11th-14th, 2010.

Invited Speaker at Max Planck Institute, Frankfurt, Germany, March 17th, 2010.

Invited Lecturer at 2010 EMBL Heidelberg Conference "The complex life of mRNA: From synsthesis to decay", Heidelberg, Germany, March 18th-20th, 2010.

Student Invited Speaker at Emory University, Biochemistry, Cell and Developmental Biology doctoral program, Atlanta, Georgia, April 8th-9th, 2010.

Invited Speaker at Harvey Society, Rockefeller University, April 29th, 2010.

PUBLICATIONS: (216 as of 3/2010)

Singer RH, Rushforth N and Burnett A. The Photodynamic Action of Light on Hydra. *J Exp Zool* **154**:169-174, 1963.

Singer RH. Analysis of Limb Morphogenesis in a Model System. *Dev Biol* **28**:113-122, 1972.

Singer RH and Penman S. Stability of HeLa Cell mRNA in Actinmoycin. *Nature* **240**: 201, 1972.

Singer RH and Penman S. Messenger RNA in HeLa Cells: Kinetics of Formation and Decay. *J Mol Biol* **78**:321, 1973 (Editorial, *Nature*, **245**:69-70).

Penman S, Price R, Perlman S and Singer RH. Transcription and Translation in Mammalian Cells. *Proc Australian Bioch Soc* **5**:262, 1972.

Penman S, Goldstein E, Reichman M and Singer RH. The Relation of Protein Synthesis Regulation and mRNA Metabolism. *Karolinska Symposium* **6**:168, 1973.

Spradling A, Singer R, Lengyel J and Penman S. Methods with Insect Cells in Suspension Culture. *Methods in Cell Biology* **10**:185, 1975.

Murphy R, Singer R, Saide J, Byron K, Blanchard M, Arnason M and Young M. Synthesis and Secretion of a New Nerve Growth Factor by Muscle Cells in Culture. *Proc Natl Acad Sci* **74**:4496-4500, 1977.

Ettienne E and Singer R. Aberrant ^{35}S Methionine Incorporation and Calcium Uptake into Dystrophic Pectoralis, Cardiac and Brain Membrane Vesicles. In: *Calcium*

Binding Proteins and Calcium Function (R.H. Wasserman, et. al., eds). Elsevier, North Holland, Inc. 491-495, 1977.

Singer R and Kessler-Icekson G. Stability of Polyadenylated Messenger RNA in Differentiating Muscle Cells. *Eur J Biochem* **88**:395-402, 1978.

Huang H, Singer RH, and Lazarides E. Actin-containing Microprocesses in the Fusion of Cultured Chick Myoblasts. *Muscle and Nerve* **1**(3):219-229, 1978.

Ettienne E and Singer RH. Calcium Binding, ATP-dependent Ca++ Transport and Total Tissue Calcium in Embryonic and Adult Avian Normal and Dystrophic Pectoralis Muscle. *J. Membrane Biol* **44**:195-210, 1978.

Kessler-Ickeson G, Singer RH and Yaffe D. The Capacity of Polyadenylated RNA from Myogenic Cells Treated with Actinomycin D to Direct Protein Synthesis in a free System. *Eur J Biochem* **88**(2): 403-410, 1978.

Murphy R, Singer RH, Pantazis N, Saide J, Arnason B and Young M. Nerve Growth Factor Production by Muscle Cells. In: *Muscle Regeneration* (A Mauro, et al, eds) Raven Press, New York, 443, 1979.

Pudney J and Singer RH. Electron Microscopic Visualization of the Filamentous Reticulum in Whole Cultured Presumptive Chick Myoblasts. *Am J An*at **156**:321-336, 1979.

Pudney J and Singer RH. Intracellular Filament Bundles in Whole Mounts of Chick and Human Myoblasts Extracted with Triton X-100. *Tissue & Cell* **12**:595-612, 1980.

Kabat-Zinn J and Singer RH. Sea Urchin Tube Feet: A Unique Structure Which Allows a Cytological and Molecular Approach to the Study of Actin and its Gene Expression. *J Cell Biol* **89**:109-114, 1981.

Ettienne E, Swartz K and Singer R. Increased Turnover of Sarcoplasmic Reticular Proteins in Dystrophic Chicken Muscle Culture. *J Biol Chem* **256**:6408-6413, 1981.

Singer R. and Ward D. Actin Gene Expression Visualized in Chicken Muscle Tissue Culture using *in situ* Hybridization with a Biotinated Nucleotide Analog. *Proc Natl Acad Sci (USA)* **79**:7331-7335, 1982.

Oblas B, Boyd N and Singer R. Analysis of Receptor-Ligand Interactions Using Nitrocellulose Gel Transfer: Application to *Torpedo* Acetylcholine Receptor and Alpha-Bungarotoxin. *Analytical Biochemistry* **130**:1-8, 1983.

Pudney J and Singer RH. Filament-Directed Intercellular Contacts during Differentiation of Cultured Chick Myoblasts. *Tissue & Cell* **16**:17-29, 1984.

Lawrence J and Singer R. Quantitative Analysis of *in situ* Hybridization Methods for the Detection of Actin Gene Expression. *Nucleic Acids Res* **13**:1777-1799, 1985.

Oblas B, Singer R and Boyd N. Location of a Polypeptide Sequence within the Alpha Subunit of the Acetylcholine Receptor Containing the Cholinergic Binding Site. *Mol Pharmacol* **29**:649-656, 1986.

Lawrence JB and Singer RH. Intracellular Localization of Messenger RNAs for Cytoskeletal Proteins. *Cell* **45**:407-415, 1986.

Singer RH, Lawrence JB and Villnave C. Optimization of *in situ* Hybridization Using Isotopic and Non-Isotopic Detection Methods. *Biotechniques* **4** (230) 250, 1986.

Singer RH, Lawrence JB and Rashtchian RN. Toward a Rapid and Sensitive *in situ* Hybridization Methodology Using Isotopic and Non-Isotopic Probes. In: *In situ Hybridization: Application to the Central Nervous System* (K Valentino, J Eberwine, J Barchas, eds) Oxford University Press, New York, pp. 71-96, 1986.

Moreland RB, Singer RH, Langevin GL, Garcea R and Hereford LM. Amino Acid Sequences that Determine the Nuclear Localization of Yeast Histone 2B. *Mol and Cell Biol* **7**:4048-4057, 1987.

Singer RH, Lawrence JB, Langevin GL, Rashtchian RN, Johnson CA, Cremer T, Tesin D, Manuelidis L and Ward DC. Double Labeling *in situ* Hybridization Using Non-Isotopic and Isotopic Detection. *Acta Histochem Cytochem* **20**:589-598, 1987.

Teneja K and Singer RH. Use of Oligodeoxynucleotide Probes for Quantitative *in situ* Hybridization to Actin mRNA. *Anal Biochem* **166**:389-398, 1987.

Lawrence JB, Villnave CA, and Singer RH. Sensitive, High-Resolution Chromatin and Chromosome Mapping *in situ*: Presence and Orientation of Two Closely Integrated Copies of EBV in a Lymphoma Line. *Cell* **52**:51-61, 1988.

Lawrence JB, Singer RH, Villnave CA, Stein JL and Stein GS. Intracellular Distribution of Human Histone mRNAs in W138 Cells Studied by *in situ* Hybridization. *Proc Natl Acad Sci (USA)* **85**:463-467, 1988.

Lawrence JB, Singer RH, and Marselle LM. Highly Localized Tracks of Specific Transcripts within Interphase Nuclei Visualized by *in situ* Hybridization. *Cell* **57**:493-502, 1989.

Lawrence JB, Taneja K, and Singer RH. Temporal Resolution and Sequential Expression of Muscle-Specific Genes Revealed by *in situ* Hybridization. *Dev Biol* **133**:235-246, 1989.

Singer RH, Langevin GL, and Lawrence JB. Ultrastructural Visualization of Cytoskeletal mRNAs and their Associated Proteins Using Double-Label *in situ* Hybridization. *J Cell Biol* **108**:2343-2353, 1989.

Singer RH, Lawrence JB, Silva F, Langevin GL, Pomeroy M and Billings-Gagliardi S. Strategies for Ultrastructural Visualization of Biotinated Probes Hybridized to Messenger RNA *in situ*. *Current Topics Microbiol Immunol* **143**:55-69, 1989.

Bashir RM, Harris ML, Hochberg FH and Singer RH. Detection of Epstein-Barr Virus in CNS Lymphomas by *in situ* Hybridization. *Neurology* **39**:813-817, 1989.

Silva F, Lawrence JB, and Singer RH. Progress Toward Ultrastructural Identification of Individual mRNAs in Thin Section: Myosin heavy-chain mRNA in Developing Myotubes. *Techniques in Immunocytochemistry* **4**:147-164, 1989.

Bashir R, Hockberg F and Singer RH. Detection of Epstein-Barr virus nucleic acids by *in situ* Hybridization: Progress Toward Development of a Non-Isotopic Diagnostic Test. *Am J Pathology* **135**:1035-1044, 1989.

Singer RH, Byron KS, Lawrence JB and Sullivan JL. Detection of HIV-1 Infected Cells From Patients Using Non-Isotopic *in situ* Hybridization. *Blood* **74**:2295-2301, 1989.

Takahashi E, Lawrence J, McNeil J, Singer R, O'Connell P, Leppert M and White R. Human Type II Collagen Gene (COL2A1) Assigned to Chromosome 12q.13-q13.2 by *in situ hybridization* with Biotiny DNA Probe. Jap *J Human Genet* **34**(4):307-311, 1989.

Singer R, Lawrence J, Bashir R, Byron K and Sullivan J. Diagnostic Applications of Non-Isotopic *in situ* Hybridization for HIV or EBV Nucleic Acids. In: Racz P, Haase AT and Gluckman JC (eds) "*Modern Pathology of AIDS and Other Retroviral Infections*". Basel, Karger, pp. 29-41, 1990.

Lawrence J, Marselle L, Johnson C, Byron K, Sullivan J and Singer R. Subcellular Localization of Low Abundance HIV Nucleic Acid Sequences Visualized by Fluorescence *in situ* Hybridization. *Proc Natl Acad Sci (USA)* **87**:5420-5424, 1990.

Lawrence J, Singer R and McNeil J. Interphase and metaphase resolution of sequences at different distances within the human dystrophin gene. *Science* **249**:928-932, 1990.

Singer R, Byron K, Lawrence JB, Sullivan JL, Yin S and Lederman L. Detection of HIV in Clinical Specimens. In: *Techniques in HIV Research.* A. Aldovini and B. Walker (eds), Stockton Press, New York, 1990.

Sundell C and Singer R. Actin mRNA localizes in the absence of protein synthesis. *J Cell Biol* **111**:2397-2403, 1990.

Taneka K and Singer R. Detection and localization of actin mRNA isoforms in chicken muscle cells by *in situ* hybridization using biotinated oligonucleotide probes. *J Cell Biochem* **44**(4):241-252, 1990.

Pomeroy M, Lawrence J, Singer R and Billings-Gagliardi S. Distribution of myosin heavy chain mRNA in embryonic muscle tissue visualized by ultrastructural *in situ* hybridization. *Dev Biol* **143**(1):56-67, 1991.

McNeil JA, Johnson CV, Carter KC, Singer RH and Lawrence JB. Localizing DNA and RNA Within Nuclei and Chromosomes. *Genet Anal Tech Appl* **8**:41-58, 1991.

Sundell C and Singer R. Requirement of microfilaments for actin mRNA sorting. *Science* **253**:1275-1278, 1991.

Lawrence JB and Singer RH. Spatial organization of nucleic acid sequences. In: *New Ways of Looking Within Cells*. Seminars in Cell Biology, R. Singer (ed), Saunders, London, 2:83-103, 1991.

Johnson CV, Singer RH and Lawrence JB. Fluorescent detection of nuclear DNA and RNA: Implications for genome organization. In: *Methods in Cell Biology Vol. 35: Functional Organization of the Nucleus.* B. Hamkalo and S. Elgin (eds), Academic Press, San Diego, pp. 73-100, 1991.

Singer RH (ed). New Ways of Looking Within Cells. Part I and Part II in *Seminars in Cell Biology* **2**:81-192, Saunders Press, London, 1991.

Singer RH. The cytoskeleton and mRNA localization. *Curr Opinion in Cell Biol* **4**:15-19, 1992.

Kislauskis EH and Singer RH. Determinants of mRNA localization. *Curr Opinion in Cell Biol* **4**:975-978, 1992.

Taneja KL, Lifshitz LM, Fay FS and Singer RH. Poly(A) codistribution with microfilaments: Evaluation by *in situ* hybridization and quantitative digital imaging microscopy. *J Cell Biol* **119**:1245-1260, 1992 (cover article).

Bassell G and Singer R. Ultrastructural *in situ* hybridization using immunoglod. In: *Immunoelectron microscopy in virus diagnosis and research*, A.D. Hyatt and B.T. Eaton, CRC Press, 1992.

Singer RH. Spatial organization of mRNA within cells. *J Cell Biochem* **52**:125-126, 1993.

Pockwinse SM, Lawrence JB, Singer RH, Stein JL, Lian JB, Stein GS. Gene expression at single cell resolution associated with development of the bone cell phenotype: Ultrastructural and *in situ* hybridization analysis. *Bone* **14**(3):347-352, 1993.

Kislauskis EH, Li Z, Singer RH and Taneja KL. Isoform-specific 3'-untranslated sequences sort α-cardiac and ß-cytoplasmic actin messenger RNAs to different cytoplasmic compartments. *J Cell Biol* **123**:165-172, 1993.

Singer RH. RNA zipcodes for cytoplasmic addresses. *Current Biol* **3**:719,721, 1993.

Rosbash M and Singer RH. RNA travel: Tracks from DNA to cytoplasm. *Cell* **75**:399-403, 1993.

Bassell GJ, Taneja KL, Kislauskis EH, Sundell CL, Powers CM, Ross A and Singer RH. Actin filaments and the spatial positioning of mRNAs. In: *Actin: Biophysics, Biochemistry and Cell Biology*, P. Higgins (ed), Academic Press, 1994.

Bassell GJ, Singer RH and Kosik KS. Association of poly (A) with microtubules in process of cultured neurons. *Neuron* **12**:571-582, 1994). (Cover article).

Bassell GJ, Powers CM, Taneja KL and Singer RH. Single mRNAs visualized by ultrastructural *in situ* hybridization are principally localized at actin filament intersections of fibroblasts. *J. Cell Biol* **126**:863-876, 1994.

Latham VM Jr, Kislauskis EH, Singer RH and Ross AF. ß-actin mRNA localization is regulated by signal transduction mechanisms. *J Cell Biol* **126**:1211-1219, 1994. (Cover article, reviewed in *Trends in Genetics* **10**:390, 1994.

Somasundaran M, Zapp ML, Beattie LK, Pang L, Byron KS, Bassell GJ, Sullivan JL and Singer RH. Localization of HIV RNA in mitochondria of infected cells: Potential role in cytopathogenicity. *J Cell Biol* **126**:1353-1360, 1994.

Bassell GJ, Taneja KL, Kislauskis EH, Sundell CL, Powers CM, Ross A, Singer RH. Actin filaments and the spatial positioning of mRNAs. *In Actin:Biophysics, Biochemistry and Cell Biology (Advances in Experimental Medicine and Ciology, 358),* ed Higg Plenum Pub Corp, 1994.

Kislauskis EH, Zhu XC and Singer RH. Sequences responsible for intracellular localization of ß-actin mRNA also affect cell phenotype. *J Cell Biol* **127**:441-451, 1994.

Zhang G, Taneja KL, Singer RH and Green MR. Localization of pre-mRNA splicing in mammalian nuclei. *Nature* **372**:809-812, 1994. (Subject of "*News and Views*" entitled Splicing in Space).

Taneja KL, McCurrach M, Schalling M, Housman DE and Singer RH. Foci of trinucleotide repeat transcripts in nuclei of cells from Myotonic Dystrophy patients. *J. Cell Biol* **128** (6): 995-1002, 1995.

Kislauskis EH, Ross A, Latham VM, Zhu X-C, Bassell GB, Taneja KL and Singer RH. The mechanism of mRNA localization: its effect on cell polarity. In *"Localized RNAs"* (H. Lipshitz, ed) *Molecular Biology Intelligence Unit*, R.G. Landes Co., Austin, TX/Springer, NY, pp. 185-195, 1995.

Long RM, Elliot DJ, Stutz F, Rosbash M and Singer RH. Spatial consequences of defective processing of specific yeast mRNAs revealed by fluorescence *in situ* hybridization. *RNA* **1**:1071-1078, 1995.

Politz JC, Taneja KL and Singer RH. Characterization of hybridization between synthetic oligodeoxyribonucleotides and RNA in living cells. *Nucl Acid Res* **23**:4946-4953, 1995.

Singer RH. Triplet repeats and human disease. *Mol Med Today* **2**:65-69, 1996.

Singer RH. RNA: Traffic report. *Trends in Cell Biol* **6**(12):456-459, 1996.

Mathijs JM, Shenoy SM and Singer RH. HIV detection in lymph nodes by image analysis of *in situ* hybridization: basis of a diagnostic test for cadaveric donors. *Transplantation Proc*, **28**:2945-2949, 1996.

Steward, O and Singer RH. The intracellular RNA sorting system: Postal zones, zip codes, mail bags and mail boxes. In*: "Post-transcription Gene Regulation" In: Modern Cell Biol* (J. Harford and D. Morris, ed.), John Wiley, NY, **17**:127-146, 1997.

Kislauskis EH, Zhu ZC and Singer RH. β-actin messenger mRNA localization and protein synthesis augment cell motility. *J. Cell Biol*. **136**, 1997.

Ross A, Oleynikov Y, Kislauskis EH, Taneja KL and Singer RH. Characterization of the β-actin zipcode binding protein. *Mol. Cell Biol.* **17**:2158-2165, 1997.

Fay FS, Taneja KL, Shenoy S, Lifshitz L. and Singer RH. Quantitative digital analysis of diffuse and concentrated compartments of nascent transcripts. *Exp. Cell Res.* **231**:27-37, 1997.

Bassell GJ and Singer RH. mRNA and cytoskeleton filaments. *Curr Opin Cell Biol.* **9**:109-115, 1997.

Davis BW, McCurrach ME, Taneja KL, Singer RH, and Housman DE. Expansion of a CUG trinucleotide repeat in the 3' untranslated region of myotonic dystrophy protein kinase transcripts results in nuclear retention of transcripts. *Proc. Natl. Acad. Sci. USA* **94**:7388-7393, 1997.

Jacobson MR, Cao L-G, Taneja K, Singer RH, Wang Y-l and Pederson T. Nuclear domains of the RNA subunit of Rnase P. *J. Cell Science* **110**:829-837, 1997.

Long RM, Singer RH, Meng X, Gonzalez I, Nasmyth K. and Jansen R-P. Mating type switching in yeast controlled by asymmetric localization of ASH1 mRNA. *Science* **277**:383-387, 1997.

Singer RH and Green MR. Compartmentalization of eukarytic gene expression: Causes and effects. *Cell*, **91**:291-294, 1997.

Bassell GJ, Zhang H, Byrd AL, Femino AM, Singer RH, Taneja KJ, Lifshitz, LM, Herman, IM and Kosik KS. Sorting of β-actin mRNA and protein to neurites and growth cones in culture. *J. Neurosci.* **18**:251-256, 1998.

Chicurel ME, Singer RH, Meyer CJ and Ingber DE. Integrin binding and mechanical tension induce movement of mRNA and ribosomes to focal adhesions. *Nature* **392**:730-733, 1998. (Selected, one of the most relevant papers of 1998 for *Nature Cell Biology* Inaugural Issue.)

Femino AM, Fay FS, Fogarty K and Singer RH. Visualization of single RNA transcripts in situ. *Science* **280**:585:590, 1998. (Cover Article).

Singer RH. Triplet-repeat transcripts: A role for RNA in disease. *Science* **280**:696-697, 1998.

Samarsky DA, Fournier M, Singer RH and Bertrand E. The snoRNA box C/D motif directs nucleolar targeting and also couples snoRNA synthesis and localization. *EMBO J* **17**:3747-3757, 1998.

Oleynikov, Y. and Singer, R.H. RNA localization. Different zipcodes, same postman? *Trends in Cell Biol.* **8**:381-383, 1998.

Bertrand, E., Chartrand, P., Schaefer, M., Shenoy, S.M., Singer, R.H. and Long, R.M. Localization of *ASH1* mRNA particles in living yeast. *Molecular Cell* **2**:437-445, 1998 (Cover Article). (Reviewed in *Cell* **91**:151-154, 1998).

Bertrand, E., Hauser-Scott, F., Kendall, A., Singer, R.H., Engelke, D.R. Nucleolar localization of early tRNA processing. *Genes & Dev.* **12**:2463-2468, 1998.

Barcellini-Couget, S., Fenard, D., Bertrand, E., Singer, R.H., Lefebvre, J.C., Doglio, A. 3'-End modification of the adenoviral VA1 gene affects its expression in human cells: consequences for the design of chimeric VA1 RNA ribozymes. *Antisense Nucleic Acid Drug Dev.* **8**:379-390, 1998.

Chartrand, P., Meng, X-H, Singer, R.H. and Long, R.M. Structural elements required for the localization of *ASH1* mRNA and of a green fluorescent protein reporter particle in vivo. *Current Biology* **9**:333-336, 1999. Reviewed in *Cell* **95**:451-460, 1998, T. Hazelrigg, The destinies and destinations of RNAs.

Politz, J., Tuft, R., Pederson, T. and Singer, R.H. Movement of nuclear poly(A) RNA throughout the interchromatin space in living cells. *Current Biology* **9**:258-291, 1999. Reviewed in *Current Biology* **9**:R412-R415, 1999. B. Daneholt, Pre-mRNP particles: from gene to nuclear pore.

Bassell, G.J., Oleynikov, Y., and Singer, R.H. The travels of mRNAs through all cells large and small. *FASEB* **13**:447-454, 1999.

Shestakova, E.A., Wyckoff, J., Jones, J., Singer, R.H. and Condeelis, J. Correlation of beta-actin mRNA localization with metastatic potential in rat adenocarcinoma cell lines. *Cancer Res.* **59**:1202-1205, 1999.

Greenberg, R.A., Chin, L., Femino, A., Lee, K.-H., Gottlieb, G.J., Singer, R.H., Greider, C.W., and DePinho, R.A. Short dysfunctional telomeres impair tumorigenesis in the INK4a$^{\Delta 2/3}$ cancer-prone mouse. *Cell* **97**:515-525, 1999.

Samarsky, D.M., Ferbeyre, G., Bertrand, E., Singer, R.H., Cedergren, R., and Fournier, M.J. A small nucleolar RNA:ribozyme hybrid cleaves a nucleolar RNA target in *in vivo* with near-perfect efficiency. *Proc. Natl. Acad. Sci. USA* **96**:6609-6614, 1999. Subject of *Perspective* in *Science* and also in *Nature Biotech.*

Politz, J.C. and Singer, R.H. *In situ* reverse transcription for detection of hybridization between oligonucleotides and their intracellular targets. *Methods in Enzymology* **18**:281-285, 1999.

Meirelles MN, Pereira MC, Singer RH, Soeiro MN, Garzoni LR, Silva DT, Barbosa HS, Arujo-Jorge TC, Masuda MO, Capella MA, Lopes AG, Vermelho AB. Trypanosoma cruzi-cardiomyocytes: new contributions regarding a better understanding of this interaction. *Mem Inst Oswaldo Cruz.* **94**(Suppl 1):149-152, 1999.

Zhang, H.L., Singer, R.H. and Bassell, R.J. Neurotrophin regulation of β-actin mRNA and protein localization within growth cones. *J. Cell Biol* **147**:59-70, 1999.

Pereira MC, Singer RH, de Meirelles MN. Ultrastructural distribution of poly (A)+ RNA during Trypanosoma cruzi-cardiomyocyte interaction in vitro: a quantitative analysis of the total mRNA content by in situ hybridization. *J. Euk. microbiol.* **47:**264-270, 2000.

Pereira MC, Singer RH, de Meirelles MN. Trypanosoma cruzi infection affects actin mRNA regulation in heart muscle cells. *J. Euk. Microbiol.* **47**:271-279, 2000.

Chartrand P, Bertrand E, Singer RH and Long RM. Sensitive, high resolution detection of RNA in situ. *Methods in Enzymology* **318**:493-506, 2000.

Vilardell J, Chartrand P, Singer RH, and Warner J. The odyssey of a regulated transcript, *RNA* **6,** (12), 1773-80, 2000.

Kendall A, Hull MW, Bertrand E, Good PO, Singer RH and Engelke DR. A *CBF5* mutation that disrupts nucleolar localization of early tRNA biosynthesis in yeast also suppresses tRNA gene-mediated transcriptional silencing. *Proc. Natl. Acad. Sci. USA,* **97**:13108-13113, 2000.

Long RM, Gu W, Lorimer E., Singer R.H., Chartrand P. She2p is a movel RNA-binding protein that recruits the Myo-4pShe3p complex to ASH1 mRNA. *EMBO J.* **19**(23):6592-601, 2000.

Fan Y, Braut S, Lin Q, Singer RH, and Skoultchi A. Determination of transgenetic loci by expression FISH. *Genomics*, **71**: 66-69, 2001.

Bassell G and Singer RH. Neuronal RNA localization and the cytoskeleton. In *Results and Problems in Cell Differentiation*, v. 34. D. Richter, ed. Springer-Verlag Berlin Heidelberg, **34**:41-46, 2001.

Long RM, Gu W, Meng X, Gonsalvez G, Singer RH, Chartrand P. An Exclusively Nuclear RNA Binding Protein Affects Asymmetric Localization of ASH1 mRNA and Ash1p In Yeast. *J. Cell Biol.* **153(2):**307-18, 2001.

Latham V.M., Jr., Yu E.H.S., Tullio A.N., Adelstein R.S. and Singer R.H. A Rho-dependent signaling pathway operating through myosin localizes ß-actin mRNA in fibroblasts. *Current Biology* **11**:1-20, 2001.

Shestakova E.A., Singer R.H. and Condeelis J. The physiological significance of ß-actin mRNA localization in determining cell polarity and directional motility. *Proc. Natl. Acad. Sci., USA*, **98**:7045-7050, 2001.

Gwizdek C., Bertrand E., Dargemont C., Lefebvre J.C., Blanchard J.M., Singer R.H., Doglio A. Terminal minihelix, a novel RNA motif that directs polymerase III transcripts to the cell cytoplasm. Terminal minihelix and RNA export. *J. Biol. Chem.* **276**(28):25910-8, 2001.

Zhang H.L., Eom T., Oleynikov Y., Shenoy S.M., Liebelt D.A., Dichtenberg J.B., Singer R.H., Bassell G.J. Neurotrophin-induced transport of a beta-actin mRNP complex increases beta-actin levels and stimulates growth cone motility. *Neuron* **31**(2):261-75, 2001.

Chartrand P., Singer R.H., Long R.M. RNP localization and transport in yeast. *Annu. Rev Cell Dev. Biol.* **17**:297-310, 2001.

Huttelmaier S., Illenberger S., Grosheva I., Rudiger M., Singer R.H., Jockusch B.M. Raver1, a dual compartment protein, is a ligand for PTB/hnRNPI and microfilament attachment proteins. *J. Cell Biol.* **155**(5):775-86, 2001.

Matthiesen SH, Shenoy SM, Kim K, Singer RH, Satir BH. A parafusin-related Toxoplasma protein in Ca2+-regulated secretory organelles. *Eur J Cell Biol.* 2001, **80**:775-83.

Gu W, Pan F, Zhang H, Bassell GJ, Singer RH. A predominantly nuclear protein affecting cytoplasmic localization of beta-actin mRNA in fibroblasts and neurons. *J Cell Biol*. 2002, **156**:41-51.

Liu G, Grant WM, Persky D, Latham VM Jr, Singer RH, Condeelis J. Interactions of Elongation Factor 1alpha with F-Actin and beta-Actin mRNA: Implications for Anchoring mRNA in Cell Protrusions. *Mol Biol Cell.* 2002, **13**:579-592.

Levsky J, Shenoy S, Pezo R, Singer RH, Single-Cell Gene Expression Profiling. *Science* 2002, **297**:836-840.

Srisawat C, Houser-Scott F, Bertrand E, Xiao S, Singer RH, Engelke DR. An active precursor in assembly of yeast nuclear ribonuclease P. *RNA.* 2002 **8**:1348-60.

Wilson, AJ, Velcich, A., Kurland, AR, Shenoy, SM., Pezo, RC., Levsky, JM, Singer, RJ., and Augenlicht, LH. Novel detection and differential utilization of a c-myc transcriptional block in colon cancer chemoprevention. *Cancer Res*. **62**:6006-6010, 2002.

Farina KL, Singer RH. The nuclear connection in RNA transport and localization. *Trends Cell Biol*. 2002 **12**:466-72.

Wang W, Wyckoff JB, Frohlich VC, Oleynikov Y, Huttelmaier S, Zavadil J, Cermak L, Bottinger EP, Singer RH, White JG, Segall JE, Condeelis JS. Single cell behavior in metastatic primary mammary tumors correlated with gene expression patterns revealed by molecular profiling. *Cancer Res*. 2002 **62**:6278-88.

Chartrand P, Meng XH, Huttelmaier S, Donato D, Singer RH. Asymmetric sorting of ash1p in yeast results from inhibition of translation by localization elements in the mRNA. *Mol Cell.* 2002 **10:**1319-30.

Levsky JM, Singer RH. Gene expression and the myth of the average cell.*Trends Cell Biol*. 2003 **13**:4-6.

Fusco D, Accornero N, Lavoie B, Shenoy SM, Blanchard J, Singer RH, Bertrand E. Single mRNA Molecules Demonstrate Probabilistic Movement in Living Mammalian Cells. *Current Biology* 2003, **13**:161-167.

Farina K.L., Huttelmaier S., Musunuru K., Darnell R., Singer R.H., Two ZBP1 KH domains facilitate β-actin mRNA localization, granule formation, and cytoskeletal attachment. *The Journal of Cell Biology* 2003 **160**:77-87.

Oleynikov Y, Singer RH, Real-Time Visualization of ZBP1 Association with beta-Actin mRNA during Transcription and Localization. *Curr Biol.* 2003 **13**:199-207.

Femino AM, Fogarty K, Lifshitz LM, Carrington W, Singer RH , Visualization of single molecules of mRNA in situ. *Methods Enzymol* 2003 **361**:245-304.

Tiruchinapalli DM, Oleynikov Y, Kelic S, Shenoy SM, Hartley A, Stanton PK, Singer RH, Bassell GJ, Activity-dependent trafficking and dynamic localization of zipcode binding protein 1 and Beta -actin mRNA in dendrites and spines of hippocampal neurons. *J Neurosci.* 2003, **23**:3251-61.

Colon-Ramos DA, Salisbury JL, Sanders MA, Shenoy SM, Singer RH, Garcia-Blanco MA. Asymmetric distribution of nuclear pore complexes and the cytoplasmic localization of β2-Tublin mRNA in Chlamydomonas reinhardtii. *Dev Cell* **4**:941-952, 2003.

Levsky JM and Singer RH. Fluorescence *in situ* hybridization: Past, present and future. *J Cell Science* **116**(14):2833-2838, 2003.

Zhang HL, Pan F, Hong D, Shenoy SM, Singer RH and Bassell GJ. Active transport of the survival motor neuron protein and the role of exon-7 in cytoplasmic localization. *J Neurosci*, **23**:6627-6637, 2003.

Matthiesen SH, Shenoy SM, Kim K, Singer RH and Satir BH. Role of the parafusin orthologue, PRP1, in microneme exocytosis and cell invasion in Toxoplasma gondii. *Cell Microbiol* **5**:613-624, 2003.

Singer RH. RNA localization: visualization in real-time. *Curr Biol* **13**:R673-R675, 2003.

Eom T, Antar LN, Singer RH and Bassell GJ. Localization of β-Actin Messenger Ribonucleoprotein Complex with Zipcode-Binding Protein Modulates the Density of Dendritic Filopodia and Filopodial Synapses. *J Neurosci* **23**:10433-10444, 2003.

Gromak N, Rideau A, Southby J, Scadden AD, Gooding C, Huttelmaier S, Singer RH and Smith CW. The PTB interacting protein raver1 regulates alpha-tropomyosin alternative splicing. *EMBO J* **22**:6356-6364, 2003.

Darzacq X, Powrie E, Gu W, Singer RH and Zenklulsen D. RNA asymmetric distribution and daughter/mother differentiation in yeast. *Curr Opin Microbiol* **6**(6):1-7, 2003.

Latham V and Singer R.H. RNA Localization and Signal Transduction. *Handbook of Cell Signaling* **3**:293-297, 2003.

Fusco D, Bertrand E, Singer RH, Imaging of Single mRNAs in the Cytoplasm of Living Cells. *RNA Trafficking and Nuclear Structure Dynamics,* ed Jeanteur P., 135-150. Springer-Verlag, 2004.

Lorenz M, DesMarais V, Macaluso F, Singer RH, Condeelis J. Measurement of barbed ends, actin polymerization, and motility in live carcinoma cells after growth factor stimulation. *Cell Motil Cytoskeleton* **57**:207-217, 2004.

Janicki SM, Tsukamoto T, Salghetti SE, Tansey WP, Sachidanandam R, Prasanth KV, Ried T, Shav-Tal Y, Bertrand E, Singer RH, Spector DL. From Silencing to Gene Expression: Real-Time Analysis in Single Cells, *Cell* **116**:683-698, 2004.

Lorenz M, Yamaguchi H, Wang Y, Singer RH, Condeelis J. Imaging sites of N-WASP activity in lamellipodia and invadopodia of carcinoma cells. *Curr Biol* **14:**697-703 2004.

Gu W, Deng Y, Zenklusen D, Singer RH A new yeast PUF family protein, Puf6p,represses ASH1 mRNA translation and is required for its localization. *Genes Dev*, **18**:1452-1465, 2004.

Shav-Tal Y, Darzacq X, Shenoy SM, Fusco D, Janicki SM, Spector DL and Singer RH. Dynamics of Single mRNPs in Nuclei of Living Cells. *Science* **304**:1797-1800, 2004.

Shav-Tal Y, Singer RH and Darzacq X, Imaging gene expression in single living cells. *Nat Rev Mol Cell Biol* **5**:855-862, 2004.

Shav-Tal Y, Shenoy SM, Singer RH. Live Cell Imaging: A Laboratory Manual, eds Goldman R and Spector D. Imaging of Single mRNAs in the Cytoplasm of Living Cells, *Cold Spring Harbor Laboratory* (2004 June).

Niessing D, Huttelmaier S, Zenklusen D, Singer RH, Burley SK. She2p Is a Novel RNA Binding Protein with a Basic Helical Hairpin Motif. *Cell* **119**:491-502, 2004.

Wang W, Goswami S, Lapidus K, Wells AL, Wyckoff JB, Sahai E, Singer RH, Segall JE, Condeelis JS, Identification and testing of a gene expression signature of invasive carcinoma cells within primary mammary tumors. *Cancer Res* **64**:8585-8594, 2004.

Condeelis JS and Singer RH, How and why does beta-actin mRNA target? *Biol Cell* **97**:97-110, 2005.

Shav-Tal Y, Blechman J, Darzacq X, Montagna C, Dye BT, Patton JG, Singer RH, Zipori D Dynamic Sorting of Nuclear Components into Distinct Nucleolar Caps during Transcriptional Inhibition. *Mol Biol Cell* **16**:2395-2413, 2005.

Faul C, Huttelmaier S, Oh J, Hachet V, Singer RH, Mundel P, Promotion of importin alpha-mediated nuclear import by the phosphorylation-dependent binding of cargo protein to 14-3-3. *J Cell Biol* **169**:415-424, 2005.

Darzacq X, Singer RH, Shav-Tal Y, Dynamics of transcription and mRNA export. *Curr Opin Cell Biol* **17**:332-339, 2005.

Mingle LA, Okuhama NN, Shi J, Singer RH, Condeelis J, Liu G, Localization of all seven messenger RNAs for the actin-polymerization nucleator Arp2/3 complex in the protrusions of fibroblasts. *J Cell Sci* **118**:2425-2433, 2005.

Capodieci P, Donovan M, Buchinsky H, Jeffers Y, Cordon-Cardo C, Gerald W, Edelson J, Shenoy SM, Singer RH, Gene expression profiling in single cells within tissue. *Nat Methods* **2**:663-665, 2005.

Shav-Tal Y, Singer RH , RNA localization. *J Cell Sci* **118**:4077-4081, 2005.

Singer RH, Lawrence DS, Ovryn B, Condeelis J, Imaging of gene expression in living cells and tissues. *J Biomed Optics* **10**:0514061-0514069, 2005.

Huang S, Singer RH, In Situ Hybridization to RNA. *Basic Methods in Microscopy*, eds Spector DL and Goldman RD, 277-290. Cold Spring Harbor Laboratory, 2005.

Condeelis J, Singer RH, Segall JE, The Great Escape: When Cancer Cells Hijack the Genes for Chemotaxis and Motility. *Annu Rev Cell Dev Biol* **21**:695-718, 2005.

Levsky JM, Braut SA, Singer RH, Single Cell Gene Expression Profiling: Multiplexed Expression Fluorescence in situ Hybridization (FISH): Application to the Analysis of

Cultured Cells. *Cell Biology: A Laboratory Handbook*, eds Celis JE, et al. Academic Press, 2005.

Huttelmaier S, Zenklusen D, Lederer M, Dictenberg J, Lorenz M, Meng X, Bassell GJ, Condeelis J, Singer RH, Spatial regulation of beta-actin translation by Src-dependent phosphorylation of ZBP1. *Nature* **438**:512-515, 2005.

Chang L, Shav-Tal Y, Trcek T, Singer RH, Goldman RD.Assembling an intermediate filament network by dynamic cotranslation, *J Cell Biol* 2006, **172**:747-58.

Chubb JR, Bloomfield G, Xu Q, Kaller M, Ivens A, Skelton J, Turner BM, Nellen W, Shaulsky G, Kay RR, Bickmore WA, Singer RH. Developmental timing in Dictyostelium is regulated by the Set1 histone methyltransferase. *Dev Biol* 2006, **292**:519-532.

Darzacq X, Kittur N, Roy S, Shav-Tal Y, Singer RH, Meier UT, Stepwise RNP assembly at the site of H/ACA RNA transcription in human cells. *J Cell Biol* 2006, **173**:207-219.

Chubb JR, Trcek T, Shenoy SM, Singer RH, Transcriptional pulsing of a developmental gene. *Curr Biol* 2006, **16**:1018-1025.

Pederson T, Singer RH, Nucleus and gene regulation. *Curr Opin Cell Biol* 2006, **18**:229-230.

Shav-Tal Y, Darzacq X, Singer RH, Gene expression within a dynamic nuclear landscape. *EMBO J* 2006, **25**:3469-3479.

Zhang HL, Xing L, Rossoll W, Wichterle H, Singer RH, Bassell GJ, Multiprotein Complexes of the Survival of Motor Neuron Protein SMN with Gemins Traffic to Neuronal Processes and Growth Cones of Motor Neurons. *J Neurosci* 2006, **26**:8622-8632.

Rideau AP, Gooding C, Simpson PJ, Monie TP, Lorenz M, Huttelmaier S, Singer RH, Matthews S, Curry S, Smith CW, A peptide motif in Raver1 mediates splicing repression by interaction with the PTB RRM2 domain. *Nat Struct Mol Biol* 2006, **13**:839-848.

Rodriguez AJ, Shenoy SM, Singer RH, Condeelis J, Visualization of mRNA translation in living cells. *J Cell Biol* 2006, **175**:55-66.

Czaplinski K, Singer RH, ZBP1 regulates mRNA stability during cellular stress. *Trends Biochem Sci* 2006, **31**:687-693.

Stöhr N, Lederer M, Reinke C, Meyer S, Hatzfeld M, Singer RH, Huttelmaier S, ZBP1 regulates mRNA stability during cellular stress. *J Cell Biol* 2006 **175**:527-534.

Kittur N, Darzacq X, Roy S, Singer RH, Meier UT, Dynamic association and localization of human H/ACA RNP proteins *RNA* **12**:2057-2062, 2006.

Garcia M, Darzacq X, Delaveau T, Jourdren L, Singer RH, Jacq C, Mitochondria-associated Yeast mRNAs and the Biogenesis of Molecular Complexes. *Mol Biol Cell* **18**:362-368, 2007.

Dong S, Li C, Zenklusen D, Singer RH, Jacobson A, He F YRA1, Autoregulation Requires Nuclear Export and Cytoplasmic Edc3p-Mediated Degradation of Its Pre-mRNA. *Mol Cell* **25**:559-573, 2007.

Gavis ER, Singer RH, Huttelmaier S, Localized Translation through Messenger RNA Localization. *Translational Control in Biology and Medicine*, eds Mathews MB and Hershey J, 689-718. Cold Spring Harbor Laboratory Press (2007 March).

Rodriguez AJ, Condeelis J, Singer RH, Dictenberg JB, Imaging mRNA movement from transcription sites to translation sites. *Semin Cell Dev Biol* **18**:202-208, 2007.

Darzacq X, Singer RH, Shav-Tal Y Dissecting Cellular Activity from Single Genes to Single mRNAs, *New Frontiers in Ultrasensitive Bioanalysis: Advanced Analytical Chemistry Applications in Nanobiotechnology, Single Molecule Detection, and Single Cell Analysis*, ed Xu XN, 29-39. Wiley-Interscience (2007 April 13).

Garcia M, Darzacq X, Devaux F, Singer RH, Jacq C, Yeast Mitochondrial Transcriptomics. *Methods in Molecular Biology: Mitochondria Practical Protocols*, eds Leister D and Herrmann J. Humana Press (2007 June 12).

Loudig O, Milova E, Brandwein-Gensler M, Massimi A, Belbin TJ, Childs G, Singer RH, Rohan T, Prystowsky MB Molecular restoration of archived transcriptional profiles by complementary-template reverse-transcription (CT-RT), *Nucleic Acids Res* **35**:e94, 2007.

Zhang HL, Xing L, Singer RH, Bassell GJ QNQKE targeting motif for the SMN-Gemin multiprotein complexin neurons, *J Neurosci Res* **85**:2657-2667, 2007.

Darzacq X, Shav-Tal Y, de Turris V, Brody Y, Shenoy SM, Phair RD, Singer RH In vivo dynamics of RNA polymerase II transcription, *Nat Struct Mol Biol* **14**:796-806, 2007.

Lapidus K, Wyckoff J, Mouneimne G, Lorenz M, Soon L, Condeelis JS, Singer RH, ZBP1 enhances cell polarity and reduces chemotaxis, *J Cell Science* **120**:3173-3178, 2007.

Levsky JM, Shenoy SM, Chubb JR, Hall CB, Capodieci P, Singer RH, The spatial order of transcription in mammalian cells, *J Cell Biochem* **102**:609-617, 2007.

Pan F, Huttelmaier S, Singer RH, Gu W, ZBP2 facilitates binding of ZBP1 to β-actin mRNA during transcription. *Mol Cell Biol*, **27**:8340-8351, 2007.

Wells AL, Condeelis JS, Singer RH, Zenklusen D, Imaging Real-Time Gene Expression in Living Systems. *Single-Molecule Techniques: A Laboratory Manual,* eds Selvin PR and Ha T, 209-238. Cold Spring Harbor Laboratory Press (2007 December).

Chao JA, Patskovsky Y, Almo SC, Singer RH, Structural basis for the coevolution of a viral RNA–protein complex. *Nat Struct Mol Biol* **15**:103-105, 2008.

Chang W, Zaarour RF, Reck-Peterson S, Rinn J, Singer RH, Snyder M, Novick P, Mooseker MS, Myo2p, a class V myosin in budding yeast, associates with a large ribonucleic acid–protein complex that contains mRNAs and subunits of the RNA-processing body. *RNA*, **14**:491-502 2008.

Pezo RC, Singer RH Nuclear microenvironment in cancer diagnosis and treatment, *J Cell Biochem*, **104**:1953-1963 2008.

Rodriguez AJ, Czaplinski K, Condeelis JS, Singer RH, Mechanisms and cellular roles of local protein synthesis in mammalian cells. *Curr Opin Cell Biol* **20**:144-149 2008.

Deng Y, Singer RH, Gu W, Translation of ASH1 mRNA is repressed by Puf6p-Fun12p/eIF5B interaction and released by CK2 phosphorylation. *Genes Dev* **22**:1037-1050 2008.

Darzacq X, Singer RH, The Dynamic Range of Transcription, *Mol Cell* **30**:545-546 2008.

Dictenberg JB, Swanger SA, Antar LN, Singer RH, Bassell GJ, A Direct Role for FMRP in Activity-Dependent Dendritic mRNA Transport Links Filopodial-Spine Morphogenesis to Fragile X Syndrome. *Dev Cell* **14**:926-939 2008.

Pezo RC, Gandhi SJ, Shirley LA, Pestell RG, Augenlicht LH, Singer RH, Single-Cell Transcription Site Activation Predicts Chemotherapy Response in Human Colorectal Tumors, *Cancer Res* **68**:4977-4982 2008.

Vainer G, Vainer-Mossel E, Pikarsky A, Shenoy SM, Oberman F, Yeffet A, Singer RH, Pikarsky E, Yisraeli JK, A role for VICKZ proteins in the progression of colorectal carcinomas: Regulating lamellipodia formation, *J Pathol* **215**:445-456 2008.

Pezo RC, Singer RH, Nuclear microenvironment in cancer diagnosis and treatment, *J Cell Biochem* **104**:1953-1963 2008.

Gu W, Wells AL, Pan F, Singer RH, Feedback regulation between ZBP1 and β-catenin mRNAs in breast cancer cells. *Mol Cell Biol* **28**:4963-4974 2008.

Singer RH, Highways for mRNA Transport, *Cell* **134**:722-723 2008.

Aizer A, Brody Y, Ler LW, Sonenberg N, Singer RH, Shav-Tal Y, The Dynamics of Mammalian P Body Transport, Assembly and Disassembly In Vivo. *Mol Biol Cell* **19**:4154-4166 2008.

Grünwald D, Shenoy SM, Burke S, Singer RH, Calibrating excitation light fluxes for quantitative light microscopy in cell biology.
Nat Protoc **3**:1809-1814 2008.

de Turris V, Singer RH, RNA in Cells. *Single Molecule Dynamics in Life Science*, eds Yanagida T and Ishii Yoshiharu, 171-190. Wiley-VCH 2008, in press.

Zenklusen D, Larson DR, Singer RH, Single-RNA counting reveals alternative modes of gene expression in yeast. *Nat Struct Mol Biol* **15**:1263-1271, 2008.

Grünwald D, Singer RH, Czaplinski K, Cell Biology of mRNA Decay. *Methods Enzymol* **448**:553-577, 2008, December 15.

Dictenberg JB, Singer RH, Dendritic RNA Transport: Dynamic Spatio-Temporal Control of Neuronal Gene Expression. *Encyclopedia of Neuroscience*, ed Squire LR, **3**:437-444, Elsevier, 2009, January 11.

Maier S, Daroqui MC, Scherer S, Roepcke S, Velcich A, Shenoy SM, Singer RH, Augenlicht LH, Butyrate and vitamin D3 induce transcriptional attenuation at the cyclin D1 locus in colonic carcinoma cells. *J Cell Physiol* **218**:638-642, 2009.

Dib A, Glebov OK, Shou Y, Singer RH, Kuehl WM , A der(8)t(8;11) chromosome in the Karpas-620 myeloma cell line expresses only Cyclin D1: Yet both Cyclin D1 and MYC are repositioned in close proximity to the 3′ IGH enhancer. (Amst). 2009 Mar 1, **8**:330-5. *DNA Repair* 2009 **8**:330-335.

Darzacq X, Yao J, Larson DR, Causse SZ, Bosanac L, de Turris V, Ruda VM, Lionnet T, Zenklusen D, Guglielmi B, Tjian R, Singer RH, Imaging transcription in living cells, *Annu Rev Biophys*. 2009 **38**:173-96.

Gu W, Pan F, Singer RH, Blocking {beta}-catenin binding to the ZBP1 promoter represses ZBP1 expression, leading to increased proliferation and migration of metastatic breast-cancer cells, *J Cell Sci.* 2009 **122**:1895-905.

Larson DR, Singer RH, Zenklusen D, A single molecule view of gene expression. Trends Cell Biol 2009 **19**:630-637.

Oeffinger M, Zenklusen D, Ferguson A, Wei KE, El Hage A, Tollervey D, Chait BT, Singer RH, Rout MP Rrp17p Is a Eukaryotic Exonuclease Required for 5' End Processing of Pre-60S Ribosomal RNA. *Mol Cell* 2009 **36**:768-781.

Chao JA, Patskovsky Y, Patel V, Levy M, Almo SC, Singer RH, ZBP1 recognition of β-actin zipcode induces RNA looping. *Genes Dev* 2010 **24**:148-158.

PATENT APPLICATIONS AND AWARDS

1. In situ hybridization to detect nucleic acid sequences in morphologically intact cells. RH Singer and JB Lawrence. Awarded December 19, 1989, NO. 4,888,278.

2. Methods for rapid detection of virus infection and for the evaluation of antiviral substances. RH Singer, K. Byron, JL Sullivan. Filed May 26, 1987.

3. In situ hybridization of single copy and multiple copy nucleic acid sequences. RH Singer and JB Lawrence. Filed October 13, 1988.

4. Non-isotopic in situ hybridization for detection of nucleic acids. RH Singer and JB Lawrence. Filed October 3, 1994. Patent #5,985,549 Awarded November 16, 1999.

5. In vivo nucleic acid hybridization methods. RH Singer and J. Politz. Filed July 20, 1993.

6. Detection of nucleic acids in cells by strand displacement amplification. RH Singer, JM Mathijs and R. Lohman. Filed December 11, 1993. Allowed October 13, 1995. Patent #5,523,204 Awarded June 4, 1996.

7. Detection of trinucleotide repeats by in situ hybridization. RH Singer and KL Taneja. Filed December 11, 1995. Patent #5,962,332 Awarded October 5, 1999.

8. Cis acting RNA sequences as targets for therapeutic agents. RH Singer and EH Kislauskis. Filed September 10, 1994. Patent #5,641,675 Awarded June 24, 1997.

9. Detection of hybridized oligonucleotide probes in living cells. RH Singer, JC Politz and KL Taneja. Filed June 7, 1995. Patent #5,728,527 Awarded March 17, 1998.

10. Fluorochrome mediated stability of oligonucleotides in living cells. RH Singer, KL Taneja and JC Politz. Filed September 19, 1995.

11. Single molecule detection using oligonucleotides. A Femino and RH Singer. Filed October 20, 1995. Patent #5,866,331 Awarded Feb. 2, 1999.

12. Detection of Fragile X triplet repeats. KL Taneja and RH Singer. Filed November 15, 1995.

13. Caged fluorochrome-labeled probes and subtraction of autofluorescence background. RH Singer, JC Politz and KL Taneja. Filed August 9, 1996. Patent #5,827,660 Awarded October 27, 1998.

14. Conserved mRNA binding protein involved in regulation (composition of Matter). Robert H. Singer and Yuri Oleynikov. Patent Disclosure, 1998.

15. Methods and materials to visualize RNA in living cells. Robert H. Singer and Edouard Bertrand. Patent Disclosure, 1998. Filed October 2, 1998.

16. FISH & CHIPS: A rapid throughput approach to expression cloning of genomic sequences, R.H. Singer, 1999. Filed April 22, 1999.

17. Visualization of RNA in living cells. Filed October 22, 1998. Patent #US 6,203,986 B1 Awarded March 20, 2001.

18. In-Situ hybridization of single-copy and multiple-copy nucleic acid sequences. Filed February 25, 1999. Patent #US 6,242,184 B1 Awarded June 5, 2001.

19. Assay of Gene Expression Patterns by Multi-Fluor Fish. U.S. Patent and Trademark No. 6,534,266 issued March 18, 2003.

20. Visualization of RNA in living cells. Robert H Singer and Edouard Bertrand filed on September 6, 2000, Patent #6,586,240 awarded on July 1, 2003.

21. Prediction of Chemotherapeutic Response via Single-Cell Profiling of Transcription Site Activation. Robert H. Singer and Rossanna Pezo, filed on May 28, 2008 No. issued.