CURRICULUM VITAE

DATE: February 21, 2018

NAME: Sanjay Tyagi

PESENT TITLE: Professor

HOME ADDRESS: 99 John Street Apt 2105
New York, New York 10038
212 213 9529

OFFICE ADDRESS: Public Health Research Institute Center
225 Warren Street
Newark, New Jersey 07103

TELEPHONE NUMBER: 973 854 3372

E-MAIL ADD. & WEB SITE: sanjay.tyagi@rutgers.edu
http://www.phri.org/research/res_pityagi.asp
https://scholar.google.com/citations?user=L7TkzV4AAAAJ&hl=en&oi=ao

CITIZENSHIP: India

EDUCATION:

A. Undergraduate

University of Rajasthan, Bikaner, India
B.S. (Zoology, Botany, Chemistry) 1978

B. Graduate and Professional

Jawaharlal Nehru University, New Delhi, India
M.Sc. (Life Sciences) 1980

Jawaharlal Nehru University, New Delhi, India
M.Phil., (Theoretical Biology) 1982

University of Maryland, College Park, MD
Ph.D. (Biochemistry)
(Advisor, Cyril Ponnamperuma) 1987

POSTGRADUATE TRAINING:

Postdoctoral Appointment
Public Health Research Institute
455 First Avenue, New York NY 10016
Molecular Genetics 1987 – 2000

ACADEMIC APPOINTMENTS:

School of Environmental Sciences
Jawaharlal Nehru University
Research Assistant August 1980 – July 1982

Department of Chemistry
University of Maryland
Research Assistant September 1982 - April 1987

The Public Health Research Institute
455 First Avenue, New York NY 10016
Senior Research Associate May 1987 – April 2000

The Public Health Research Institute
455 First Avenue, New York NY 10016
Associate Member April 2000 – November 2004

The Public Health Research Institute
455 First Avenue, New York NY 10016;
After January 2006: 225 Warren Street, Newark NJ 07103
Member November 2004 – present

Department of Medicine
Rutgers University, New Jersey Medical School
Associate Professor January 2006 – present
Professor July 1 2012 - present

OTHER EMPLOYMENT OR MAJOR VISITING APPOINTMENTS:

Consultant to biotechnology firms (1-3 year contracts, occurred from 1988-2004)

Gene Track Systems
Abbott Laboratories
Gen Probe
Vysis
Hamilton Thorne Biosciences
Cytec
Gumtech
Oncor
Stratagene
Smith-Kline Beecham

AWARDS AND HONORS:

Jawaharlal Nehru University Merit Scholarship
Jawaharlal Nehru University
1978

Rameshwar Das Ji Birla Memorial Fellowship
Rameshwar Das Ji Birla Memorial Trust
1980

Graduate Research Assistantship
University of Maryland

1982

Jacob Heskel Gabbay Award for Biotechnology and Medicine
Brandeis University
2005
http://www.rose.brandeis.edu/Center/gabbay_award.html

Research Excellence Award
New Jersey Medical School
2012

BOARDS OF DIRECTORS/TRUSTEES POSITIONS

Scientific Advisory Board of Gorilla Genomics

SERVICE ON NATIONAL GRANT REVIEW PANELS, STUDY SECTIONS, COMMITTEES:

National Institutes of Health
National Science Foundation
Netherlands National Grant Applications
Portuguese Granting Agency - Crioestaminal Award in Biomedicine.

SERVICE ON MAJOR COMMITTEES:

AdHoc Reviewer for Scientific Journals:
(from 1988-present)
Science
Nature
Proceedings of the National Academy of Sciences;
Nucleic Acids Research
Journal of Molecular Biology
Nature Medicine
Nature Biotechnology
Nature Methods
Nature Structural Biology
Journal of American Chemical Society
BioTechniques
Analytical Biochemistry
Journal of Acquired Immune Deficiency Syndrome
Biochemistry
Genetic Analysis

SERVICE ON GRADUATE SCHOOL COMMITTEES:

Organize Invited Speaker Seminar Series at PHRI 2008 – present

TEACHING RESPONSIBILITIES:

A. Lectures or Course Directorships

Rutgers University Newark
Two lectures per year in Cell Biology course (120:524) 2008-2012

NJMS – Graduate School of Biomedical Sciences
Advances in Nucleic Acids course, Course Organizer, Mukund Modak
Single 2 hour lecture

NJMS - Seminars in Biomedical Sciences (MSBS 5910Q), Raymond Birge
Single 1.5 hr lecture

B. Research Training

Postdoctoral fellows trained

Osama Alsmadi	1998-2001
Robert Vartikyan	1999-2000
Quinge Li	2000-2001
Dan-Oscar Antson	2001-2005
Patrick van den Bogaard	2005-2009

Doctoral students trained

Herman Blok, Utrech University	1990-1992
Salvatore Marras, University of Leiden	1996-2003
Musa Mhlanga, New York University	1998-2004
Diana Bratu, New York University	1998-2004
Arjun Raj, Courant Institute of Mathematical Sciences	2003-2006
Mona Batish, Post-doctoral fellow, PHRI	2007-2011
Khyati Shah, NJIT	2007-2011
Wei Yang, UMDNJ	2008-2012
Michael Levandoscki, UMDNJ	2007-2012
LaTasha Fraser, Rutgers Univeristy	2013-Present
Felix Radford, Rutgers University	2014-2016
Sukanya Das, Rutgers University	2014-2017
Krys Maingrette, Rutgers University	2017-Present

Thesis Committee - Numerous students – Most recently Neetu Rajdan
Atul Khataokar, Kalyan Chavda,
Aysegul Guvenek, Helena Flores Mello

GRANT SUPPORT:

A. Principal Investigator

2018 – 2023	National Institutes of Health R01 Award Background free amplified single-molecule FISH for in situ and flow cytometric applications 1R01CA227291 557,328 per year
2017 - 2018	NJMS Dean's Biomedical Research Program Award Origins of Stochastic Burst in RNA Synthesis 25000 total award.
2012 – 2017	National Institutes of Health R01 Award Rapid Analysis of Single T-cell Immunity Signatures in Tuberculosis 1R01AI106036 3,749,245 total award in direct support. Multi PI grant shared with Yuri Bushkin and Maria Laura Gennaro
2007 – 2012	National Institutes of Health R01 Award Imaging the Transport of Individual mRNA Molecules to the Active Synapses 1R01MH079197 $ 2,220,000 total award
2010 - ongoing	Laboratory share of royalties and fees received for licensed single-molecule FISH (Stellaris probes) technology. Laboratory share about 40000 per year.
2004 - 2008	National Institutes of Health R01 Award Visualizing the Movement of mRNAs in Living Cells GM-070357 $1,138,508 total award
2007-2008	National Institutes of Health R01 Award High throughput PCR assays for diagnosing tuberculosis 1R03AI072105 $7,488 total award

1999 - ongoing	The Public Health Research Institute Laboratory share of royalties and fees received for licensed molecular beacon technology. This varies from year to year and is shared with the laboratory of Fred Russell Kramer. In 2010 the two laboratories received $746,812 which funded ongoing research.
1999-2004	National Institutes of Health R01 Award Detecting mRNAs in Living Cells with Molecular Beacons ES-10536 $1,594,450 total award
1991-1992	Center for Aids Research Developmental Award Directed Evolution of Ribozymes that Cleave HIV-1 RNA $64,000 total award

B. Co-Investigator

2017 - 2022	NIH R01 Award (PI Lanbo Shi)
2013 -2018	NIH R01 Award (PI Marila Gennero)
2001-2006	National Institutes Health R01 Award (PI Issar Smith) *M. tuberculosis* and Host Gene Expression During Infection. Total direct costs $300,000. Tyagi portion $100,000 per year direct costs.
1998-2000	National Institutes of Health R01 Award, Activation of senescence of helper T lymphocytes, Doris Tse, Principal Investigator. Total direct costs $150,000. Tyagi portion $30,000 per year direct costs.

PUBLICATIONS:

A. Refereed Original Articles in Journals

1. 1. **Tyagi S**, Origin of translation: the hypothesis of permanently attached adaptors, Origins of Life, 11: 343-351, 1981
2. Lomeli H, **Tyagi S**, Pritchard CG, Lizardi PM, and Kramer FR, Quantitative assays based on the use of replicatable hybridization probes. Clin Chem, 35: 1826-1831, 1989
3. **Tyagi S**. and Ponnamperuma C, Nonrandomness in prebiotic peptide synthesis, Journal of Molecular Evolution, 30: 391-399, 1990
4. **Tyagi S**, Landegren U, Tazi M, Lizardi PM, and Kramer FR, Extremely sensitive, background-free gene detection using binary probes and Qβ replicase. Proc Natl Acad Sci USA, 93: 5395-5400, 1996
5. **Tyagi S** and Kramer FR, Molecular beacons: probes that fluoresce upon hybridization. Nature Biotechnol, 14: 303-308, 1996, Cover Article
6. Hsuih TCH, Park YN, Zaretsky C, Wu F, **Tyagi S**, Kramer FR, Sperling R, and Zhang DY, Novel, ligation-dependent PCR assay for detection of hepatitis C virus in serum. J Clin Microbiol, 34: 501-507, 1996
7. Gao W, **Tyagi S**, Kramer FR, and Goldman E, Messenger RNA release from ribosomes during 5'-translational blockage by consecutive low-usage arginine but not leucine codons in *Escherichia coli*. Mol Microbiol, 25: 707-716, 1997
8. **Tyagi S**, Bratu DP, and Kramer FR, Multicolor molecular beacons for allele discrimination. Nature Biotechnol, 16: 49-53, 1998
9. Kostrikis LG, **Tyagi S**, Mhlanga MM, Ho DD, and Kramer FR, Spectral genotyping of human alleles. Science, 279: 1228-1229, 1998
10. Piatek AS, **Tyagi S**, Pol AC, Telenti A, Miller LP, Kramer FR, Alland D, Molecular beacons sequence analysis for detecting drug resistance in Mycobacterium tuberculosis, Nature Biotechnology; 16: 359-363, 1998
11. Giesendorf BAJ, Vet JAM, **Tyagi S**, Mensink EJMG, Trijbels FJM, Blom HJ, Molecular beacons a new approach to semiautomated mutation analysis, Clinical Chemistry; 44: 482-486, 1998
12. Manganelli R, Dubnau E, **Tyagi S**, Kramer FR, and Smith I, Differential expression of ten sigma factor genes in *Mycobacterium tuberculosis*. Mol Microbiol, 31: 715-724, 1999

13. Vet JAM, Majithia AR, Marras SAE, **Tyagi S**, Dube S, Poiesz BJ, and Kramer FR, Multiplex detection of four pathogenic retroviruses using molecular beacons. Proc Natl Acad Sci USA, 96: 6394-6399, 1999
14. Marras SAE, Kramer FR, and **Tyagi S** , Multiplex detection of single-nucleotide variations using molecular beacons. Genetic Analysis, 14: 151-156, 1999
15. Gozalez E, Bamshad M, Sato N, Mummidi S, Dhanda R, Catano G, Cabrera S, McBride M, Cao X, Merrill G, O'Connell P, Bowden DW, Freedman BL, **Tyagi S**, Anderson SA, Walter EA, Evans JS, Stephan KT, Haro L, Clark RA, Ahuja SS, Dolan MJ, and Ahuja SK, Race-specific HIV-1 disease-modifying effects associated with CCR5 haplotypes, Proceedings of the National Acadamy of Sciences USA, 96: 12004-12008, 1999
16. Bonnet G, **Tyagi S**, Libchaber A, and Kramer FR, Thermodynamic basis of the enhanced specificity of structured DNA probes. Proc Natl Acad Sci USA, 96: 6171-6176, 1999
17. Xiao G, Chicas A, Olivier M, Taya Y, **Tyagi S**, Kramer FR, and Bargonetti J, A DNA damage signal is required for p53 to activate gadd45. Cancer Res, 60: 1711-1719, 2000
18. Park S, Wong M, Marras SA, Cross EW, Kiehn TE, Chaturvedi V, **Tyagi S**, Perlin DS, Rapid identification of *Candida dubliniensis* using a species-specific molecular beacon, Clin Microbiol; 38: 2829-2836, 2000
19. **Tyagi S**, Marras SAE, and Kramer FR, Wavelength-shifting molecular beacons. Nature Biotechnol, 18: 1191-1196, 2000
20. El-Hajj H, Marras SAE, **Tyagi S**, Kramer FR, and Alland D, Detection of rifampin resistance in *Mycobacterium tuberculosis* in a single tube with molecular beacons. J Clin Microbiol, 39: 4131-4137, 2001
21. Marras SAE, Kramer FR, and **Tyagi S**, Efficiencies of fluorescence resonance energy transfer and contact quenching in oligodeoxyribonucleotide probes. Nucleic Acids Res, 30: E122, 2002
22. Phadtare S, **Tyagi S**, Inouye M, Severinov K, Three amino acids in Eschericia coli CspE surface-exposed aromatic patch are critical for nucleic acid melting activity leading to transcription antitermination and cold-acclimation of cells. J Biol Chem 46706-46711, 2002
23. Bratu DP, Cja B-J, Mhlanga MM, Kramer FR and **Tyagi S**, Visualizing the distribution and transport of mRNAs in living cells, Proceedings of the National Academy of Sciences USA, 100, 13308-13313, 2003
24. Zhu G, Xiao H, Mohan VP, Tanaka K, **Tyagi S**, Tsen F, Salgame P and Chan J, Gene expression in the tuberculous granuloma: analysis by laser capture microdissection and real-time PCR. Cellular Microbiology,7, 445-453, 2003
25. Shi L, Jung YJ, **Tyagi S**, Gennaro ML, North RJ, Expression of adaptive Th1-mediated immunity induces non-replicating persistence of *Mycobacterium tuberculosis* in the lungs of aerosol-infected mice, Proceedings of the National Academy of Sciences USA, 100, 241-246, 2003
26. **Tyagi S** and Alsmadi OA, Imaging native β-actin mRNA in motile fibroblasts, Biophysical Journal, 87, 4153-4746, 2004, Cover Article
27. Marras SA, Gold B, Kramer FR, Smith I, **Tyagi S**, Real-time measurement of *in vitro* transcription, Nucleic Acids Research, 32, E72, 2004
28. Vargas DY, Raj A, Marras SAE, Kramer FR, and **Tyagi S**, Mechanism of messenger RNA transport in the nucleus. Proceeds of the National Academy of Sciences USA 102, 17008-17013, 2005
29. Mhlanga MM, Vargas DY, Fung CW, Kramer FR and **Tyagi S**, tRNA-linked Molecular Beacons for Imaging mRNAs in the Cytoplasm of Living Cells, Nucleic Acids Research, 33, 1902-1912. 2005, Cover Article
30. Mhlanga MM and **Tyagi S**. (2006) Using tRNA-linked molecular beacons to image cytoplasmic mRNAs in live cells. Nature Protocols 1, 1392-1396, 2006
31. Raj A, Peskin CS, Tranchina D, Vargas YD, and **Tyagi S**, Stochastic mRNA Synthesis in Mammalian Cells, *PloS* Biology, 4, e309, 2006
32. Carroll KD, Bu W, Palmeri D, Spadavecchia S, Lynch SJ, Marras SA, **Tyagi S**, Lukac DM, Kaposi's Sarcoma-associated herpesvirus lytic switch protein stimulates DNA binding of RBP-Jk/CSL to activate the Notch pathway, J Virol. 80, 9697-709, 2006
33. Marras SA, **Tyagi S**, Kramer FR, Real-time assays with molecular beacons and other fluorescent nucleic acid hybridization probes. Clin Chim Acta. 363, 48-60, 2006
34. Raj A, van den Bogaard P, Rifkin, SA, van Oudenaarden A, **Tyagi S**, Imaging individual mRNA molecules using multiple singly labeled probes, Nature Methods, 5, 877-879, 2008, CF-58

35. Kumar P, Nath K, Rath B, Sen MK, Vishalakshi P, Chauhan DS, Katoch VM, Singh S, **Tyagi S**, Sreenivas V, Prasad HK. Visual format for detection of Mycobacterium tuberculosis and *M. bovis* in clinical samples using molecular beacons, J Mol Diagn, 11, 430-438, 2009.
36. El-Hajj HH, Marras SA, **Tyagi S**, Shashkina E, Kamboj M, Kiehn TE, Glickman MS, Kramer FR, Alland D. Use of sloppy molecular beacon probes for identification of mycobacterial species, J Clin Microbiol, 47, 1190-1198, 2009
37. **Tyagi, S**, Imaging intracellular RNA distribution and dynamics in living cells. Nature Methods, 6, 331-338, 2009
38. Vargas DY, Shah K, Batish M, Levandoski M, Sinha S, Marras, SAE, **Tyagi S**. (2011) Single-Molecule Imaging of Tanrscriptionally Coupled and Uncoupled Splicing. Cell, 147,1054-1065. Featured Article, the second most downloaded article in the month
39. Batish M, van den Bogaard P, Kramer FR, **Tyagi S** (2012) Neuronal mRNAs travel singly into dendrites. Proc Natl Acad Sci USA 109: 4645-4650
40. Chudaev M, Poruri K, Goldman E, Jakubowski H, Jain MR, Chen W, Li H, Tyagi S, Mandecki W. (2013) Design and properties of efficient tRNA: EF-Tu FRET system for studies of ribosomal translation, Protein Engineering Design and Selection, 26 , 347-357.
41. Shah K, Tyagi S (2013) Barriers to Transmission of Transcriptional Noise in a c-fos c-jun Pathway, Molecular Systems Biology, 9, 687. doi:10.1038/msb.2013.45
42. Markey FB, Ruezinsky W, Tyagi S, Batish M (2014) Fusion FISH imaging: single-molecule detection of gene fusion transcripts in situ. PLoS One 9: e93488. PMI: 24675777
43. Xu S, Tyagi S, Schedl P (2014) Spermatid cyst polarization in Drosophila depends upon apkc and the CPEB family translational regulator orb2. PLoS Genet 10: e1004380. PMI: 24830287
44. Patil S, Fribourg M, Ge Y, Batish M, Tyagi S, Hayot F and Sealfon SC, (2015) Single-cell analysis shows that paracrine signaling by first responder cells shapes the interferon-β response to viral infection, Science Signaling, 8, ra16.
45. Bushkin Y, Radford F, Pine R, Lardizabal A, Mangura BT, Gennaro M, Tyagi S (2015) Profiling T Cell Activation Using Single-Molecule Fluorescence In Situ Hybridization and Flow Cytometry, The Journal of Immunology, 194, 836-841.
46. Bijlard M, Klunder B, de Jonge JC, Nomden A, Tyagi S, de Vries H, Hoekstra D, Baron W (2015) Transcriptional Expression of Myelin Basic Protein in Oligodendrocytes Depends on Functional Syntaxin 4: a Potential Correlation with Autocrine Signaling, Molecular and Cellular Biology, 35, 675-687.
47. Tyagi S, (2015) Tuning noise in gene expression, Molecular Systems Biology 11, 805.
48. Vir P, Arrigucci R, Lakehal K, Davidow AL, Pine R, Tyagi S, Bushkin Y, Lardizabal A, Gennaro ML (2015) Single-Cell Cytokine Gene Expression in Peripheral Blood Cells Correlates with Latent Tuberculosis Status. PLoS One 10: e0144904.
49. Vargas, DY, Kramer, FR, Tyagi, S, and Marras, SAE (2016) Multiplex Real-Time PCR Assays that Measure the Abundance of Extremely Rare Mutations Associated with Cancer. PloS One 10(12), e0156546.
50. Arrigucci R, Bushkin Y, Radford F, Lakehal K, Vir P, Pine R, Martin D, Sugarman J, Zhao Y, Yap GS, Lardizabal AA, Tyagi S, Gennaro ML (2017) FISH-Flow, a protocol for the concurrent detection of mRNA and protein in single cells using fluorescence in situ hybridization and flow cytometry. Nat Protoc 12: 1245-1260.

B. Books, Monographs and Chapters

1. Batish M, Raj A, **Tyagi S**, Single molecule imaging of RNA *in situ*. Methods Mol Biol 714: 3-13, 2011
2. Raj, A, **Tyagi, S,** Detection of individual endogenous RNA transcripts in situ using multiple singly labeled probes, Methods in Enzymology, 472, 365-386, 2010
3. Kramer FR, Marras SAE, and **Tyagi S**, Inventing Molecular Beacons, In The PCR Revolution, ed., Stephen A. Bustin, Cambridge University Press, 2010
4. Marras SAE, Kramer FR, and **Tyagi S**, Genotyping single nucleotide polymorphisms with molecular beacons. In "Single Nucleotide Polymorphisms: Methods and Protocols," Kwok PY, ed., Humana Press, Totowa, New Jersey, 2002
5. Gao W, **Tyagi S**, Kramer FR, and Goldman, E, Use of molecular beacons to probe for messenger RNA release from ribosomes during 5'-translational blockage by consecutive low-usage codons in *Escherichia coli*. In "Advances in Nucleic Acid and Protein Analyses, Manipulation, and

Sequencing," Limbach PA, Owicki JC, Raghavachari R, and Tan W, eds., Society of Photo-Optical Instrumentation Engineers, Bellingham, Washington, 9-20, 2002

6. **Tyagi S**, Marras SAE, Vet JAM, and Kramer FR (2000) Molecular beacons: hybridization probes for the detection of nucleic acids in homogeneous solutions. In "Nonradioactive Analysis of Biomolecules," Kessler C, ed, Springer-Verlag, Berlin, Germany, 606-616
7. **Tyagi S** and Ponnamperuma C (1989) A study of peptide synthesis by amino-acyl nucleotide anhydrides. In Prebiological self-organization of matter (Editors Ponnamperuma C and Eirich F), A. Deepak Publishing, Hampton VA, pp. 197-4
8. Radford F, Tyagi S, Gennaro ML, Pine R, Bushkin Y (2016) Flow cytometric characterization of antigen-specific T cells based on RNA and its advantages in detecting infections and immunological disorders. Critical Reviews in Immunology 5: 359-37

C. Patents

1. Target Mediated in situ signal amplification with dual interacting hairpin probes, US Provisional Application, June 9 2017.
2. Imaging individual mRNA molecules using multiple singly labeled probes, US Patent 9,896,720. Raj A and **Tyagi S**
3. Oligonucleotide Facilitated Coalescence, US Patent 7,129,087, 2006, Kramer, FR, Alsmadi OA, and **Tyagi S**
4. High specificity primers, amplification methods and kits, 6,277,607, 2001, **Tyagi S**, Kramer FR, and Vartikian R
5. High specificity primers, amplification methods and kits, 6,365,729, 2002, **Tyagi S**, Kramer FR, and Vartikian R
6. Wavelength-shifting probes and primers and their use in assays and kits, 6,037,130, 2000, **Tyagi S**, Kramer FR, and Marras SAE
7. Non-competitive co-amplification methods, 6,461,817, 2002, Kramer FR, **Tyagi S**, Alland D, Vet J, and Piatek A
8. Nucleic acid detection probes having non-FRET fluorescence quenching and kits and assays including such probes, 6,150,097, 2000, **Tyagi S** and Kramer FR
9. Detectably labeled dual conformation oligonucleotide probes, assays and kits, 6,103,476, 2000, **Tyagi S**, Kramer FR, and Lizardi PM
10. Detectably labeled dual conformation oligonucleotide probes, assays and kits, 5,925,517, 1999, **Tyagi S**, Kramer FR, and Lizardi PM
11. Diagnostic assays and kits for RNA using RNA binary probes and a protein that is a RNA-directed RNA ligase, 5,807,674, 1998, **Tyagi S**
12. Sensitive nucleic acid sandwich hybridization assay, 5,759,773, 1998, **Tyagi S**, Kramer FR, Lizardi PM, Landegren UD, and Blok HJ
13. Diagnostic assays and kits for RNA using RNA binary probes and a ribozyme ligase, 5,652,107, 1997, Lizardi PM, **Tyagi S**, Landegren UD, Kramer FR, and Szostak JW
14. Assays and kits incorporating nucleic acid probes containing an improved molecular switch, 5,312,728, 1994, Lizardi PM, Kramer FR, **Tyagi S**, Guerra CE, Lomeli-Buyoli HM, Chu BC, Joyce GF, and Orgel LE
15. Nucleic acid probes containing an improved molecular switch, 5,118,801, 1992, Lizardi PM, Kramer FR, **Tyagi S**, Guerra CE, and Lomeli-Buyoli HM

D. Other Articles (Reviews, Editorials, etc.) In Journals and Books

1. **Tyagi S**. E. coli, what a noisy bug, Science, 329, 518-519, 2010
2. **Tyagi, S.** Splitting or stacking fluorescent proteins to visualize mRNA in Living Cells. Nature Methods 4, 391-392, 2007
3. **Tyagi, S.** RT-PCR enters the realm of stochastic gene expression. Genetic Engineering News, March 2007
4. **Tyagi S**, Taking a census of mRNA populations with microbeads, Nature Biotechnology, 18: 597-598, 2000
5. **Tyagi S**, DNA Probes, Encyclopedia of Analytical Chemistry, John Weily, Oxford, 2000

6. Marras SA, Kramer FR, **Tyagi S**. Genotyping SNPs with molecular beacons. Methods Mol Biol 212: 111-128, 2003
7. Cayouette M, Sucharczuk A, Moores J, **Tyagi S**, and Kramer FR, Using molecular beacons to monitor PCR product formation. Strategies, 12: 85-92, 1999
8. **Tyagi S**, Taking DNA probes into a protein world, Nature Biotechnology, 14: 947-948, 1996
9. **Tyagi S,** Probing Diagnostics, Biotechnology, 12: 624, 1994
10. Kramer FR, Lizardi PM, and **Tyagi S**, Qβ amplification assays. Clin Chem, 38: 456-457, 1992

PRESENTIONS:

1. On the origins of protein synthesis, International Conference on the Living State, New Delhi, India 1981
2. A study of peptide synthesis by amino-acyl nucleotide anhydrides, 8th College Park Colloquium on Chemical Evolution, College Park, Maryland 1987
3. Qß replicase mediated amplification of RNA, Annual Meeting of American Society of Microbiology, New Orleans 1992
4. Qß replicase mediated amplification of RNA, Summer Course on PCR Assisted Methods, Department of Medical Genetics, Uppsala, Sweden 1992
5. Molecular beacons: probes that fluoresce upon hybridization, Annual Meeting of the Society of Industrial Biology, Research Triangle Park 1996
6. Molecular beacons: probes that fluoresce upon hybridization, Center for Studies in Physics and Biology, Rockefeller University, New York 1996
7. Molecular beacons: probes that fluoresce upon hybridization, Department of Biochemistry, City University of New York, New York 1996
8. Molecular beacons, IBC conference on Diagnostic Gene Detection Technology, San Diego 1996
9. Multicolor molecular beacons for genetic analysis, Elli Lilly, Indianapolis 1996
10. Molecular beacons for homogeneous, real-time, allele specific detection, Biotechnologia Habana, Havana, Cuba 1997
11. Multicolor molecular beacons for homogenous detection of nucleic acids, 4th International conference on mutation detection, Bruno, Czech Republic 1997
12. Multicolor molecular beacons for DNA diagnostics, 7th Annual meeting of New York Biotechnology Association, New York, New York 1997
13. Detection of single nucleotide variations in DNA with molecular beacons, 25th Silver Jublee FEBS meeting, Copenhagan, Denmark 1998
14. Molecular beacons: probes that fluoresce upon hybridization, Department of Medicine, University of Texas, San Antonio 1998
15. Multicolor molecular beacons for allele discrimination in homogenous solutions, Cambridge Healthtech Institute Gene Quantitation conference, San Diego 1998
16. Molecular beacons: simplifying diagnostics and genetic analysis, New York City Department of Health, New York 1998
17. Multiplex detection of single-nucleotide variations with molecular beacons, 5th International Conference on Mutations in the Human Genome, Vicoforte, Italy 1999
18. Using molecular beacons to detect nucleic acids in sealed tubes and in living cells, IBC Conference on Detection Technologies, Seattle 1999
19. Detecting single-nucleotide variations with molecular Beacons, 2nd International Meeting on Single Nucleotide Polymorphisms and Complex Genome Analysis, Schloss Hohenkammer, Germany 1999
20. Molecular beacons: probes that fluoresce upon hybridization, 11th NAITO Conference on Structural Genomics, Kanagawa, Japan 1999
21. Molecular Beacons: Probes that Become Fluorescent Upon Hybridization, University of Oregon, Corvallis, CA 1999
22. Molecular beacons: probes that fluoresce upon hybridization, Wyeth-Ayerst Research, Pearl River, NY, 2000
23. Detecting mRNAs in living cells with molecular beacons, ABRF annual meeting, Bellevue, WA, 2000
24. Molecular beacons: probes that fluoresce upon hybridization, Center de Recherche en Infectiologie de l'Universite Laval, Quebec, Canada 2000

25. Properties and application of Molecular Beacons - Probes that fluoresce upon hybridization, EMBO practical course: Advanced techniques in molecular medicine, EMBO Summer Course, Uppsala University, Sweden, 2000
26. Using molecular beacons for detection of drug resistance in *Mycobacterium tuberculosis*, International Symposium on *Mycobacterium tuberculosis* Pathogenesis, Protection and Control, Bose Institute, Calcutta, India 2001
27. Detection of single-nucleotide variations with molecular beacons, Genome sequencing and biology 2001 meeting, Cold Spring Harbor Laboratory, New York, 2001, Session Chair
28. Detection of nucleic acids in test tubes and living cells with molecular beacons, Cambridge Health Institute's Sixth Annual Gene quantification and numerical supremacy, San Diego 2001
29. Detecting nucleic acids in test tubes and living cells with molecular beacons, IUPAC International Congress on Analytical Sciences, Waseda University, Tokyo, Japan, 2001
30. Detecting nucleic acids in test tubes and living cells with molecular beacons, International Center for Genetic Engineering and Biotecyhnology, New Delhi, 2002
31. Detection of nucleic acids in test tubes and living cells with molecular beacons, Elbert Einstein College of Medicine, New York, 2002
32. Visualizing the distribution and transport of mRNA in living cells, Department of Biology, Brandies University, Massachusetts, 2003
33. Visualizing the distribution and transport of mRNA in living cells, Department of Biochemistry and Molecular Biology, University of Medicine and Dentistry, Newark, 2003
34. Visualizing the distribution and transport of mRNA in living cells, Patel Chest Institute, New Delhi, 2003
35. Visualizing the distribution and transport of mRNA in living cells, Mount Sinai School of Medicine, May 25 2004
36. Visualizing the distribution and transport of mRNA in living cells, American Chemical Society Meeting, Philadelphia, August 22, 2004
37. Visualizing the distribution and transport of mRNA in living cells, Keck Graduate Institute, Claremont, CA, January 9, 2005
38. Deciphering the Mechanism of mRNA Transport in the Nucleus by Tracking Individual mRNA Molecules, Jacob Heskel Gabbay Award for Biotechnology and Medicine-Lecture, Brandeis University, Waltham MA, November 2005
39. Mechanism of mRNA Transport in the Nucleus, University of Central Florida, February 2006
40. Deciphering the Mechanism of mRNA Transport in the Nucleus by Tracking Individual mRNA Molecules, EMBO Symposium, Uppsala University, Uppsala, Sweden, June 20 2006
41. Deciphering the Mechanism of mRNA Transport in the Nucleus by Tracking Individual mRNA Molecules, International Conference on Single Cell and Single Molecule Analysis, Uppsala University, Uppsala, Sweden, June 22 2006
42. Mechanism of mRNA Transport in the Nucleus, Newark Cell Biology Journal Club, Rutgers University, July 7 2006
43. Deciphering the Mechanism of mRNA Transport in the Nucleus by Tracking Individual mRNA Molecules, 16th International Microscopy Society Meeting, Sapporo, Japan, September 7 2006
44. Mechanism of mRNA Transport in the Nucleus, New York University Imaging group, Jan 22, 2007
45. Mechanism of mRNA Transport, PITTCON conference Chicago, February 26, 2007
46. Stochastic mRNA Synthesis in Mammalian Cells, Q-PCR Symposium, Munich, March 26, 2007
47. Stochastic mRNA Synthesis in Mammalian Cells, Q-PCR Symposium, San Francisco, October 27, 2007
48. From Random Busts of Synthesis to Random Walks – Tracking Early Lives of Individual mRNA Molecules in the Nucleus, University of Pennsylvania, February 7, 2008
49. Single-molecule FISH probes, Biosearch Technologies, December 8, 2008
50. Early Lives of mRNA Molecules in the Nucleus: From Synthesis in Stochastic Bursts to Dispersal By Brownian Diffusion, Peking University, Beijing, March 27, 2009
51. Early Lives of mRNA Molecules in the Nucleus: From Synthesis in Stochastic Bursts to Dispersal By Brownian Diffusion, Ventana Medical Systems, Tucson, October 22, 2010
52. Single molecule imaging of transcriptionally coupled and uncoupled splicing, Cold Spring Harbor Symposium on Eukaryotic mRNA Processing, August, 23, 2011
53. From random bursts of synthesis to random walks - tracking early lives of individual mRNA molecules in the nucleus, Biophysics Colloquium, Cornell University, Ithaca, October 5, 2011

54. From random bursts of synthesis to random walks - tracking early lives of individual mRNA molecules in the nucleus, Bioengineering, University of California, Berkley, November 7, 2012.
55. Origins and propagation of transcriptional noise in eukaryotic gene expression, CABM, Robertwood Johnson Medical School, February 2, 2014.
56. Origins and consequences of stochastic mRNA synthesis in higher eukaryotes, Janelia Farm, March 17, 2014.
57. Studying barriers of transmission of transcriptional noise by single molecule-FISH, Applications of in situ hybridization in research and disease, Cancer Research UK Cambridge Institute, University of Cambridge, May 7-8, 2015.
58. Origins and consequences of stochastic mRNA synthesis in higher eukaryotes, UCLA Molecular Biology Institute Weekly Semianrs, February 2, 2016.
59. Origins and consequences of stochastic mRNA synthesis in higher eukaryotes, Albert Einstein College of Medicine, Bronx New York, May 24, 2017.

Press about published articles

1. Charles Cantor, Lighting up Hybridization, Nature Biotechnology, 14, 264 (1996)
2. Andy Coghlan, Brilliant Beacons color-code genes, New Scientist, March Issue, 24 (1996)
3. Harvey Baily, Detecting Drug Resistant Tuberculosis: Beacons in the Dark, 16, 331 (1998)
4. Editorial, DNA Hairpins are more specific genetic probes, Biophotonics International, January/February Issue 15 (1998)
5. Deborah Wilkinson, When you wish upon a star – molecular beacons – real time in a twinkle, The Scientist, March Issue 22-24 (1999)
6. Stu Borman, Molecular Break Lights Detecting DNA-cleaving Agents, Chemical and Engineering News, December Issue 51 (2000)
7. David Larousserie, Lumiere sur les genes!, Sciences Et Avenir, July Issue, 61 (2000)
8. Peter Mitchell, Turning the spotlight on cellular imaging, Nature Biotechnology, 19, 1013 (2001)
9. Kevin Robinson, Molecular Beacon Detect Seven Targets in One Shot, Biophotonics International, March-April Issue (2001)
10. Clare Thomas, Enlightened Messages, Nature, 426, 27 (2003)
11. Gilbert Chin, See *oskar* Move, Science, 302, 1119 (2003)
12. Henery Nicholls, Beacons throw spotlight on mRNA two-step, Elsvier BioMedNet Gateways and News, 7 November (2003)
13. Isil Aksan Kurnaz, Molecular beacons of mRNA trafficking, Elsvier Biomednet, 3 December (2003)
14. Kathryn Aschheim, Transcript tracking, Nature Biotechnology, 21, 1455 (2003)
15. Diana Gitig, RNA transport in real time, Biotechniques, 35, 1113 (2003)
16. Jayaram et al., Who is who in Biotech, Nature Biotechnology, 24, 291 (2006)
17. Monya Baker, Ten Years of Nature Biotechnology Research, Nature Biotechnology, 24, 301 (2006)
18. Françoise Chanut, Chance Fluctuations in mRNA Output in Mammalian Cells, *PloS* Biology, e319 (2006)
19. Daniel Evanko, Snapshots of gene expression, Nature Methods, 3, 774 (2006)
20. Bruce Hamilton and Xiang-Dong Fu, Tracking Intron Removal in Real Time, Developmental Cell, 21, 979-980 (2011)
21. Darren J. Burgess, Nature, Review Genetics, Gene expression: Splicing steps aside to consider its options, 13, 2-3 (2011).
22. Rusk N. Timing of Introns Departure, Nature Methods, 9, 122-123 (2012).
23. Baker, M. RNA Imaging In situ, Nature Methods, 9, 787-790 (2012).
24. Miliaras, N, biotechniques.com, 2017, For Single-cell Protein and RNA Analysis, Go FISH-Flow!
25. Phys.Org, Researchers develop protocol to analyze many cells at once, May 19, 2017. https://phys.org/news/2017-05-protocol-cells.html