CURRICULUM VITAE
Christopher H. Contag

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Neonatal and Developmental Medicine
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Academic Training:

Stanford University School of Medicine	Postdoctoral Fellow	1990 - 1995
University of Minnesota, Department of Microbiology	Postdoctoral Fellow	1988 - 1989
University of Minnesota, Department of Microbiology	Ph.D., Microbiology	1983 - 1988
University of Minnesota, College of Biological Sciences	B.S., Biology	1981 - 1982
Iowa State University		1978 - 1981

Academic Positions Held:

• Assoc Chief (Research)	Division of Neonatal and Developmental Medicine	2009-present
• Director	Stanford Center for Military Photomedicine	2008-present
• Director	Stanford Infrared Optical Science and FEL Center	2008
• Professor	Neonatal and Developmental Medicine, Department of Pediatrics, Stanford University School of Medicine.	2012-present
• Professor	Department of Microbiology and Immunology (secondary appt.) Stanford University School of Medicine.	2012-present
• Professor	Department of Radiology (by courtesy)	2012-present
• Assoc. Professor	Neonatal and Developmental Medicine, Department of Pediatrics, Stanford University School of Medicine.	2005-2008
• Assoc. Professor	Department of Microbiology and Immunology (secondary appt.) Stanford University School of Medicine.	2005-2008
• Assoc. Professor	Department of Radiology (by courtesy) Stanford University School of Medicine.	2005-2008
• Director	Stanford Center for Innovation in *In Vivo* Imaging (SCI^3), Clark Center for Biomedical Engineering and the Bio-X Program, Stanford University	2000-present
• Co-director	Molecular Imaging Program at Stanford (MIPS) Stanford University	2003- present
• Faculty member	Program in Immunology, Stanford University	2001-present
• Faculty member	Molecular Imaging Program Stanford (MIPS)	2003-present
• Faculty member	BioX Program	2001-present
• Asst. Professor	Department of Radiology (by courtesy) Stanford University School of Medicine.	2001-2005
• Asst. Professor	Department of Microbiology and Immunology (secondary) Stanford University School of Medicine.	2000-2005
• Asst. Professor	Neonatal and Developmental Medicine, Department of Pediatrics Stanford University School of Medicine.	2000-2005
• Acting Assistant Professor	Neonatal and Developmental Medicine, Department of Pediatrics, Stanford University School of Medicine.	1997
• Pediatrics fellow	Neonatal and Developmental Medicine, Department of Pediatrics, Stanford University School of Medicine.	1995-1996
• Postdoctoral fellow	Department of Microbiology and Immunology, Stanford University School of Medicine. In the laboratory of Dr. James I. Mullins.	1989-1994
• Investigator	Woods Hole Marine Biological Laboratory, Woods Hole, MA In collaboration with Dr. Harvey Fishman.	Summer 1991
• Pre- and Postdoctoral fellow	Department of Microbiology, University of Minnesota. In the laboratories of Dr. Peter G.W. Plagemann and Dr. Ashley T. Haase.	1983 - 1989

Other Positions Held:

• Secretary/Treasurer	Center for Molecular Imaging Innovation and Translation Society for Nuclear Medicine and Molecular Imaging (SNMMI)	2012-2014
• Founder	Skin Deep Diagnostics	2011
• Founder	ConcentRx Corp	2010
• President	Society for Molecular Imaging	2002-2003
• President Elect	Society for Molecular Imaging	2001-2002

• Consultant & Chair of the Scientific Advisory Board	Xenogen Corporation, Alameda, CA (Now part of Perkin Elmer)	1997-
• Founder and President	Xenogen Corporation, Alameda, CA (Now part of Perkin Elmer)	1995-1997

Honors and Awards:

- **James C. Overall Lecturer in Pediatrics**, Vanderbilt University 2013
- **Keynote Address**, Imaging in Drug Development 2013
- **Fellow** of the World Molecular Imaging Society 2012
- **Invited Lecture**, European Society of Clinical Infectious Disease 2011
  Milan, Italy
- **Opening Plenary Lecture**, European Society for Molecular Imaging 2010
  Warsaw Poland.
- **Invited Lecture,** Regenerative Medicine Conference 2009
  Hilton Head, South Carolina
- **Invited Lecture,** British Society of Immunology, 2008
  Cambridge University "Visions of Immunology"
- **Distinguished Lecture**, UC Davis: In Vivo Applications of Bioluminescence 2008
- **Invited Lecture**, Nobel Symposium: Watching life through Molecular Imaging 2007
- **Invited Lecturer**, Wallenberg Neuroscience Center at Lund University 2007
- **Keynote Address**, Gordon Research Conference "Cancer Models and Mechanisms", 2007
- **Achievement Award**, Society for Molecular Imaging 2006

- Poster of Distinction during Digestive Disease Week 2005
  Hemin-Activated Mesothelial Cells Home To the Pancreas and Protect From Pancreatitis
- Article entitled "Advances in *in vivo* bioluminescence imaging of gene expression" as 2003
  published in the journal "Annual Rev. Biomed. Eng." is one of the most cited papers in the field of engineering--ISI

Postdoc

- Imaging of Single Living Cells, Cold Spring Harbor, Award 1996
- American Federation for Clinical Research (AFCR). Upjohn Infectious Disease Prize 1995
- Scholar of the American Foundation for AIDS Research (AmFAR) 1991 -1994
- National Research Service Award, Postdoctoral, NIAID training grant: Molecular 1989 -1991
  Basis of Host Parasite Interactions. Stanford University School of Medicine

Graduate School

- National Research Service Award; NCI Cancer Biology Training Grant 1988 -1989
  University of Minnesota School of Medicine
- Viral Research Grant, ViroMed and Minnesota Chapter of the National 1987 -1988
  Foundation for Infectious Diseases
- Bacaner Research Award, Minnesota Medical Foundation and 1988
  Basic Science Departments, University of Minnesota.
- National Research Service Award, NCI cancer biology training grant. 1984 -1988
  University of Minnesota School of Medicine.

Teaching Experience:

- Instructor, Advanced Molecular Imaging and it Clinical Translation 2013
  Emerging Technologies for Molecular Imaging
  Harvard University, Boston, MA
- Course Director 2009-2011
  Biomedical Engineering 222a, 222b, 222c: Multi-modality molecular imaging in living subjects
- Lectures on Intravital Microscopy for the study of the tumor microenvironment 2013
  BioE222c: Multi-modality molecular imaging in living subjects
- Lecture on immune cell therapies in Cancer Center Course, Stanford University 2008
- Lectures on stem cell imaging 2008
  Developmental Biology 202: Stem cell biology and regenerative medicine
- Lectures on i) metabolic enzymes as mediators of immune response, ii) the role of cell 2006-2011
  fusion in the immune response to infection, and iii) tumor immunology and the cancer stem cell. **Advanced Immunology 202**: Topics in Immunology
- Lecture on mini-microscopes and the emerging field of in vivo pathology 2008
  Medicine 217: Technological Frontiers in Digestive Diseases
- Lectures on tissue regeneration and cell fusion 2007
  Biomedical Engineering 390: Introduction to Bioengineering Research
- Lectures on tissue optics, and reporter gene construction and uses in vivo 2004-2013
  Biomedical Engineering 222a: Multi-modality molecular imaging in living subjects

- Lectures on imaging stem cell biology, miniaturized microscopes and cell fusion 2007-2009
  Lectures on optical reporter genes 2013
  Biomedical Engineering 222b: Multi-modality molecular imaging in living subjects
- Lecture on novel methods of studying host pathogen interactions in vivo 2004
  Microbiology and Immunology 210: Pathogenesis of Bacteria, Viruses and Eukaryotic Parasites
- Lecture on Optical Imaging in Medicine 2004
  Medicine 459: Frontiers in Digestive Diseases
- Lecture on Advancing animal models of human disease 2003
  Comparative Medicine 208: Animals Advancing Biomedical Technology
- Lecture on Molecular Imaging 2003
  Radiology 220: Introduction to Imaging and Image-based Human Anatomy
- Lecturer, Small Animal Imaging Workshop at Stanford University 2006, 2007, 2008
- Organizer, Jackson Labs workshop on *in vivo* imaging 2002
- Instructor, Recent advances in cell-based and *in vivo* imaging, University of Bristol 2000
- Instructor, United Nations AIDS Course on Heteroduplex Analyses of HIV-1, Moscow, Russia 1996
- Instructor, WHO Course on Heteroduplex Analyses of HIV-1; Salvador, Brazil 1995
- Lectures on Toga-, Flavi- Reo- and Retroviruses in Animal Virology (graduate). 1990, 1993, 1996
  Stanford University School of Medicine.
- Virology Section of Medical Microbiology (undergraduate), University of Minnesota. 1987
- Teaching Assistant for laboratory courses at the University of Minnesota:
  Microbiology for Medical Students 1987
  Molecular Biology (graduate laboratory course) 1986
  Virology (undergraduate and graduate) 1985
  General Microbiology (undergraduate) 1984

Service:

Stanford University

- Member, Administrative Panel on Biosafety (APB) 1999-2002
- Member, Molecular Imaging Faculty Search Committees – Dept. of Radiology 1999, 2003
- Member, Bone Marrow Transplant Faculty Search Committee – Dept. of Medicine 2000-2004
- Member, Graduate student admissions committee, Microbiology and Immunology 2000-2001
- Member, Medical Student Admissions Panel 1999-2004
- Member, Committee on Graduate Education and Research, Dept . of Biomedical Engineering 2002
- Member, Pediatric Cardiopulmonary Faculty Search Committee – Dept. of Pediatrics 2004
- Member, Administrative Committee for the Hansen Experimental Physics Laboratory 2004-
- Session Chair, Stanford Photonic Research Center Annual meeting 2005, 2006
- Member, Scientific advisory board, Children's Heath Research Program 2008
- Member, Pediatric Pulmonology Faculty Search Committee 2008
- Member, Pediatric Pulmonology Faculty Search Committee 2009
- Chair, Scientific advisory board, Children's Heath Research Program 2009-2012

National and International

- Member, Editorial Board, **Molecular Imaging** 2001-
- Member, Editorial Board, **Molecular Imaging and Biology** 2010-
- Member, Editorial Board, **Cancer Biology and Therapy** 2006-
- Member, Editorial Board, **Disease Models and Mechanisms** 2008-
- Member, Editorial Board, **BMC Medical Physics** 2008-
- Member, Editorial Board, **Analytical Cellular Pathology** 2010-
- Member, Editorial Board, **Imaging in Medicine** 2010-
- Co-Editor, **Current Opinion in Biotechnology**, 2008
  Analytical Biotechnology section (vol. 20, issue 1)
- Reviewer for: 1997-

Nature	**Nature Medicine**	**Gene Therapy**
Science	**Molecular Imaging**	**Neoplasia**
Nature Biotechnology,	**Cellular Microbiology**	**PNAS**
European Journal of Cancer	**Molecular Therapy**	**Virology**
Journal Biomedical Optics	**Genes and Development**	**Blood**
Journal of Virology	**Human Gene Therapy**	**Cancer Research**
Nature Reviews Cancer	**Nature Methods**	**Nature Protocols**
International Immunology	**BMC Immunology**	**Molecular Imaging Biol.**
PLos One	**International Journal of Cancer**	
Cancer Prevention Research	**Bioorganic & Medicinal Chemistry Letters**	
Journal of Chemistry and Biology		

- NCI/Special Emphasis Study Section, Development and Application of Imaging in Therapeutic Studies. CA98-024; NIH-National Cancer Institute (NCI) 1999
- NCI/Special Emphasis Study Section, Diagnostic Imaging and Guided Therapy in Prostate Cancer. CA99-015; NIH-National Cancer Institute (NCI) 2000
- NCI/Special Emphasis Study Section, Diagnostic Imaging and Guided Therapy in Prostate Cancer. SBIR/STTR. PAR99-149; NIH-National Cancer Institute (NCI) 2000
- Founding Member of the Society for Molecular Imaging (SMI) 2000
  President elect 2002, President 2003, Board member 1999-
- External Advisory Board, Vanderbilt University Imaging Program (VIVID) 2001-2005
- Member, NIH/DMG Study Section, Diagnostic Imaging 2002
- Member, Steering Committee, Annual Meeting of the Society for Molecular Imaging (SMI) 2002
- Member, Scientific Program Committee, Annual Meeting of the Society for Molecular Imaging (SMI) 2002
- MOLI Board - National Cancer Institute Molecular Imaging Database 2002
- Member, organizing committee, NIDDK/JDFI Workshop. Imaging the Pancreatic Beta Cell 2003
- AdHoc member, CSR/NIH Biodefense and emerging infectious diseases 2003
- AdHoc member, CSR/NIH Cancer Genetic Study Section Cancer Molecular Pathobiology (CAMP) 2003
- AdHoc member, NIHM/NIH study section ZMH1 BRB-S 04 2003
- Reviewer, NIHM/NIH study section ZRG1 F05 50 R.1 2003
- External reviewer, The Netherlands Organization for Health Research and Development 2003
- Reviewer, European Commission Research Programme on Genomics 2003
- Reviewer, European Commission Research Programme on Molecular Imaging Centers 2003
- Chair, Steering Committee Annual Meeting of the Society for Molecular Imaging (SMI) 2003
- Member, Steering Committee Annual Meeting of the Society for Molecular Imaging (SMI) 2004
- NCI/Special Emphasis Study Section, Small Animal Imaging Resource Programs CA 04-011,; NIH-National Cancer Institute (NCI) 2004
- Session Chair. Imaging host pathogen interactions Annual Meeting of the Society for Molecular Imaging (SMI) 2004
- Co-Chair, Steering Committee, Network in Translational Research in Optical Imaging, NCI 2004
- Reviewer, Lymphoma Leukemia Society SCOR grants 2004
- Guest editor Journal Biomedical Optics Special Issue: Chemical and genetic biosensors for biomedical imaging 2005
- Member, Scientific Advisory Board Sandler Foundation for Asthma Research 2005-2007
- Program co-chair, Imaging in 2020, Jackson WY 2005
- Member, Advisory Board Washington University Molecular Imaging Program 2005-2010
- Chair, Steering Committee, Network in Translational Research in Optical Imaging, NCI 2006
- Member Program Committee, Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues III part of SPIE's International Symposium on Biomedical Optics 2006
- Reviewer, NIH Biomedical Imaging and Bioengineering, Medical Imaging (MEDI) 2005, 2006
- Advisory Board Member, NanoSafety Inc 2006
- Organizing committee, OSA Special Topics Meeting 2006
- Member, Medical Imaging Study Section (MEDI), Center for Scientific Review, NIH 2006-2010
- Member, Clinical Molecular Imaging Study Section (CMIP), Center for Scientific Review, NIH 2008-2010
- Member, Scientific Advisory Committee International Society of Bioluminescence and Chemiluminescence 2006
- Member, Special Emphasis Panel, Digestive Disease Research Core Centers ZDK1 GRB-4 [J1] NIH/NIDDK 2006
- Member, Advisory Board University Pennsylvania, Network in Optical Imaging 2005-2010
- Member, Advisory Board University California, Irvine, Small Animal Imaging Program 2007-
- Chair, Steering Committee, Network in Translational Research in Optical Imaging, NCI 2007-2008
- Member Review Committee, Cancer Imaging Centers for the Cancer Research UK (CR-UK) and the Engineering & Physical Sciences Research Council (EPSRC) 2008
- Member Program Committee AACR National Meeting Molecular Imaging Section 2009
- Member, NCI Special Emphasis Panel: Mouse models of human cancer consortium 2009
- Member, Advisory Board for imaging cancer stem cells, NCI 2009
- Member, Scientific Review Committee for AACR Basic Cancer Research Fellowships 2010
- Category Co-chair and Session Chair, World Molecular Imaging Congress 2010
- Adhoc Reviewer, ZRG1 SBIB-D (01) M Member Conflict: Clinical Molecular Imaging Study Section (CMIP), Center for Scientific Review, NIH 2010
- Adhoc Reviewer, ZRG1 F15-D (20) L Fellowships: Biomedical Imaging and Bioengineering), 2010

Center for Scientific Review, NIH
- Adhoc Reviewer, ZRG1 SBIB-E (02) M Member Conflict: SAT and BTSS Study Sections, Center for Scientific Review, NIH — 2010
- Member NIH NExT Committee and Special Emphasis Panel — 2010-present
- Member, SNM Molecular Imaging Curriculum Task Force — 2010
- Member, SNM Molecular Imaging Center of Excellence — 2010
- Member, Board of Directors, SNM Center for Molecular Imaging Innovation and Translation — 2011-present
- Member, NCI Experimental Therapeutics (NExT) Program Special Emphasis Panel — 2011
- Adhoc Reviewer, ZRG1 F15-P; Fellowships Surgical Sciences, Biomedical Imaging and Bioengineering — 2011, 2012
- Adhoc Reviewer, ZRG1 F15-P(20)L Special Emphasis Panel Fellowships Surgical Sciences, Biomedical Imaging and Bioengineering — 2011, 2012
- Member, American Association of Cancer Research (AACR) Scientific Program Committee — 2012
- Chairperson, ***In Vivo* Imaging** Subcommittee of the Tumor Biology Section AACR Program Committee — 2012
- Program Committee, BioNanophotonics and Molecular Probes" OSA BIOMED Topical Meeting — 2012
- Member, Program Committee, AACR-SNM joint meeting on Imaging of Cancer Biology — 2013
- Reviewer, ZRG1 DTCS A81--Clinical and Translational Imaging Applications — 2012, 2013
- Co-chair, Society of Nuclear Medicine and Molecular Imaging Optical Imaging Task Force — 2012
- Member, Lynbrook Excellence in Education (LExE) Board of Directors — 2010-present
- Member, Four Elements Earth Education (4EEE) Board of Directors — 2012-present
- Session Chair, World Molecular Imaging Congress — 2013

Extramural Funding

Current Federal funding:

- **Stanford Center for Military Photomedicine, DOD** — 2007-2013
  F9550-04-1-0075 (Principal Investigator: **C.H. Contag**)
- **Multimodality Imaging of GI Cancers for Diagnosis and Directed Therapy, NIH/NCI** — 2008-2013
  U54 CA136465 (Principal Investigator: **C.H. Contag**)
- **In vivo and Molecular Imaging Center @ Stanford** — 2010-2015
  P50CA114747 (Principle Investigator, S.S. Gambhir)
- **Cancer Imaging Program—Cancer Center, NIH/NCI** — 2009-2015
  3 P30 CA124435 (Principal Investigator: B. Mitchell)
- **Tools for tracking breast cancer progression, NIH/NCI** — 2011-2014
  Supplement to U54 CA136465 (Principle Investigator, **C.H. Contag**)
- **Dynamic Imaging of EMT in the Breast Cancer Microenvironment** — 2013 – 2018
  1R01CA172895-01A1 (Principle Investigator, **C.H. Contag**) NIH/NCI
- **HER2-targeted exosomal delivery of therapeutic mRNA for enzyme pro-drug therapy** — 2013 – 2017
  1UH2TR000902-0 (Matin, Stanford University) NIH/NCI
- **Targeted therapy in type 1 diabetes** — 2013 – 2018
  R24DK096465-01A1 (Moore, Harvard Univ.) NIH/NIAID
- **(PQC2) High-content pathology with confocal microscope arrays** — 2013 – 2017
  1R01CA180152-01 (Principle Investigator, **C.H. Contag**) NIH/NIBIB/NCI

Current California State funding:

- **Engineering stem cell allografts for 'operational tolerance', CIRM** — 2010-2013
  RM0101706 (Principal Investigator: **C.H. Contag**)
- **Magnitite biosynthesis in mammalian cells for MR contrast, CIRM** — 2011-2013
  CIRM (Rutt, Stanford University)

Current Foundation funding:

- **Culture methods for studying the tumor microenvironment** — 2011-2013
  ARDF (Principle Investigator, **C.H. Contag**)

Current Internal funding:

- **Image guided resection of medulloblastoma** — 2011-2013
  Center for Children's Brain Tumors at Stanford (Principal Investigator: **C.H. Contag**)
- **Detection of circulating tumor cells** — 2012-2013
  BioX at Stanford (Principal Investigator: **C.H. Contag**)
- **Mechanisms of fetal bradycardia**
  Cardiovascular Institute at Stanford (Principal Investigator: **C.H. Contag**) — 2013-2014

Pending:

(PQC4) Modeling the Breast Cancer Bone Metastatic Niche

1R01CA-pending-01 (Contag) NIH/NIAID 2/1/14 – 1/31/18

Recent Past:

• Genetic engineering of the IC2 antibody for imaging of pancreatic beta cell mass 2010-2011
Pediatric Research Fund at Stanford (Principal Investigator: C.H. Contag)

• CCL5 & CCR5: a role in CD8 T cell trafficking into adipose tissue and insulin resistance 2011-2012
Pediatric Research Fund at Stanford (Principal Investigator: C.H. Contag)

• Mechanisms of preterm birth caused by infection, March of Dimes 2011-2012
Pilot project on March of Dimes Center grant (Principal Investigator: **C.H. Contag**)

• Development of Probes for Fluorogenic In Vivo Imaging of Tuberculosis 2007-2011
S080047 Bill & Melinda Gates Foundation ((Principle Investigator, Rao)

• Molecular Pathogenesis of Digestive Diseases 2006-2012
P30 DK056339-06 (Principle Investigator, H. Greenberg)

• Delivery of Biologically Active Nucleic Acid to Epidermal Cells, NIH/NIAMS 2009-2011
A subcontract from Transderm Inc. (Principal Investigator: **C.H. Contag**)

• Bone Marrow grafting for leukemia and lymphoma, NIAID/NIH 2002-2012
PO1 CA49605-14 (Principal Investigator: R. Negrin)

• NSF Center for Biophotonics Science & Technology 2001-2011
002865-SU (Principal Investigator: D. Mathews, UC Davis)

• Hematopoietic Defect due to Heme Oxygenase 1 Deficiency; NIH/NIDDK 2007-2011
1KO1 DK071716-01; (Principle Investigator, Y-A Cao)

• Extracellular replication of Listeria, NIH/NIAID 2009-2011
R01 DK070749 (Principal Investigator: **C.H. Contag**)

• Detection of neoplasia in the esophagus, NIH/NCI 2005-2010
U54 CA105296-01 (Principal Investigator: **C.H. Contag**)

• Nanopaticle delivery of siRNA; SPARK Internal Stanford award 2009
(Principal Investigator: **C.H. Contag**)

• Use of dual axes confocal microscopy to visualize tumor margins in medulloblastoma 2008-2010
Children's Brain Cancer Center (Principal Investigator: **C.H. Contag**)

• Nanoparticle Formation and Biodistribution for Optimizing Therapy
1 R21 CA125467 (Principle Investigator: R. Zare)

• Development of siRNA Delivery methodologies using In vivo Imaging Models 2009-2011
1R44AR055881 (Contag)

• Delivery of Biologically active nucleic acids to epidermal cells 2009-2011
1RC2AARR058955-02 (Kaspar and Contag)

• Multi-modality Cellular Imaging of Vascular Inflammation 2006-2010
RO1HL078678 (Principle Investigator, M. McConnell)

• Effect of statins on heme oxygenase-1 regulation, NIH/NICHD 2007-2010
1R21 HD050351-01A2 (Principle Investigator: Stevenson)

• Small Animal Imaging Core Resource. Stanford University Program in Biomed. Engineering 2005
and Child Health Initiative-Lucille Packard Foundation.
(Principal Investigators: **C. H. Contag**)

Past:

• Mobilized dendritic cells for lung cancer, NIH
PO1HL57443-06 (Principal Investigator: E. Engleman)

• Regulation of heme oxygenase in neonatal animals, NIH/NICHD
RO1 HL58013 (Principal Investigators: D.K. Stevenson and **C.H. Contag**)

• Monitoring tumor progression in living animals, NIH/NCI
RO1 CA80006-01 (Principal Investigators: R.S. Negrin and **C.H. Contag**)

• Therapeutic Use of Heme Analogs: Absorption in Intestine, NHLB/NIH
RO1 HL 68703 (Principal Investigators: D.K. Stevenson and **C.H. Contag**)

• Spatiotemporal analysis of neoplastic disease. NCI/NIH
R24 CA 92862 (Principal Investigators: **C. H. Contag**, M. Bednarski, M. Moseley)

• Therapeutic Radionuclide Tumor-Targeting Strategy for Breast Cancer; DOE
95382 **(**Principal Investigator: B. Franc, UCSF)

• Visible Models of Neoplastic Disease, NIH/NCI
R33 CA88303 (Principal Investigators: **C.H. Contag** and R.S. Negrin)

• Visualizing tumor progression and therapy in living animals, Leukemia Society
6090-99 (Principal Investigators: R.S. Negrin and **C.H. Contag**)

• Oral immunization against HIV using attenuated salmonella strains as gene delivery vehicles
(Stanford, CHI-Packard Foundation; Principal Investigator: **C. H. Contag**)

• Molecular Biophotonics, ONR
N00014-91-C-1-0170 (Principal Investigator: **C. H. Contag**)

- Vertical transmission of HIV in Zimbabwe, NIH/NIAID
  RO1 A139013 (Principal Investigator: D. Katzenstein)
- Imaging Spontaneous Breast Cancer in Mouse Models, NIH/NCI
  R21 CA87386-01A1 (Principal Investigators: **C.H. Contag** and R.S. Negrin)
- *In vivo* multimodality Imaging of Neoplastic Disease, NCI/NIH
  P20 CA86312-01 (Principal Investigators: **C. H. Contag**, M. Moseley, M Bednarski)
  R24 HD37543 (Principal Investigators: **C.H. Contag** and D.K. Stevenson)
- Visualizing insulitis: IDDM pathogenesis and therapy, NIH/NIDDK
  RO1 DK58664 (Principal Investigators **C.H. Contag** and C.G. Fathman)
- Novel Cancer Targeting Mechanism for Imaging with PE; DOD
  WH-05-1-0059 (Principal Investigator: B. Franc, UCSF)
- Gene therapy of IDDM and its complications, JDFI
  4-2001-9, JDFI Center Grant (Principal Investigator: C. G. Fathman)
- Spatiotemporal analysis of neonatal host response, NIH/NICHD-NIAID

Invited Seminars (Recent and Selected from over 500):

- Ernst Strüngmann Forum on Heavy Metals and Infectious Disease 2014
  Frankfurt am Main, Germany
- Department of Molecular Medicine, Mayo Clinic, Rochester, MN 2013
  Image-guidance in the development of a dual-biotherapy
- Cambridge Healthtech Institute Second Annual Future Diagnostics conference at 2012
  University of California, Irvine
  Point-of-care pathology with miniaturized microscopes
- Imaging in 2020 2012
  Molecular determinants of immune cell migration
- Pediatric Grand Rounds, Stanford University 2012
  Use of imaging to refine and accelerate preclinical models of human biology and disease
- ISMRM workshop on Immune Cell Trafficking, Miami Beach 2012
  Imaging immune cell fates and function
- Department of Bioengineering Case Western Reserve University 2012
  Advancing immune cell therapies through imaging
- Pittcon 2012 2012
  Miniaturized cofocal microscopes for point-of-care pathology
- AACR, **Major Symposium**: Immune cell function and cancer in vivo: 2012
  Visualizing friends and foes. Optimizing Immune Cell Therapies with Optical Imaging
- Department of Bioengineering, University of Southern California 2012
  Early detection of GI cancers with miniaturized microscopes
- École Polytechnique Fédérale de Lausanne 2012
  Dual biotherapy for the treatment of cancer
- University of Massachusetts, Worchester 2012
  Use of imaging to refine and accelerate animal models of human biology and disease
- **Keynote address,** Japanese Society of Molecular Imaging 2012
  Use of imaging to refine and accelerate animal models of human biology and disease
- Korean Association of Immunologists, Seoul National University 2011
  Image-guidance to advance immunotherapies for cancer
- **Plenary Lecture**, Global Research and Development Centers, Seoul, Korea 2011
  Green Science and Technology for Health and Environment
  Imaging with molecular specificity and cellular resolution for early cancer detection
- Texas A&M Biomedical Engineering Seminar Series 2011
  Point-of-care pathology with miniaturized microscopes
- **Plenary Lecture**. International Symposium in Radiology, Seoul, Korea 2011
  Optical imaging for early detection of cancer
- 8th Annual World Congress of IBMISPS on Brain, Spinal Cord Mapping & 2011
  Image Guided Therapy. San Francisco, CA, Guided resection of medulloblastoma using a miniature confocal microscope
- **Keynote Address**. Canada/UK/US Workshop on Imaging, London, UK 2011
  Enabling the future of imaging science
- **Invited lecture**. European Congress on Clinical Microbiology and Infectious Diseases and International Congress of Chemotherapy (ECCMID/27th ICC), Milan Italy 2011
  Advances in imaging of infection
- SU2P Photonics meeting, St. Andrews, Scotland 2011

Point-of-care microscopy: Molecular imaging with cellular resolution
- Advances in Optics for Biotechnology, Medicine and Surgery XII, Naples, Florida 2011
  Miniature microscopes for point-of-care pathology, early detection of cancer and guided resection of malignancy
- Biotechnology Training Program Symposium, Charlottesville, VA 2011
  Point-of-care microscopy for early detection and guided resection of malignancy
- AACR Annual Meeting, Orlando FL 2011
  Point-of-care Microscopy for Early Detection and Guided Resection of Malignancy
- NSF meeting on the Physics of Cancer Metastasis, Arlington, VA 2010
  Targeting the cancer stem cell for therapy
- Departmental Seminar, BioEngineering, UC Berkeley 2010
  Point-of-care microscopy: Molecular imaging with cellular resolution
- Orthopaedic Research Society, New Orleans, LA 2010
  "Imaging stem cell fate and function"
- **Keynote Address.** European Society for Molecular Imaging, Warsaw, Poland 2010
  Point-of-care microscopy: Molecular imaging with cellular resolution
- Molecular Diagnostics for Cancer Drug Development, Boston, MA 2010
  Point-of-care microscopy: can we change the current paradigm in cancer diagnosis?
- CCSIP, UC—Canada Bioimaging Workshop on Biophotonics, Vancouver, Canada 2010
  Point-of-care microscopy: Molecular imaging with cellular resolution
- Gordon Conference on Drug Delivery, Waterville Valley, NH 2010
  Advancing drug delivery through imaging
- International Congress on Biophotonics, Quebec City, Quebec 2010
  Advancing Drug Discovery and Delivery Through In vivo Imaging
- American Transplantation Society, Orlando, FL 2010
  Imaging stem cell engraftment and hematopoietic reconstitution
- AACR" Colorectal Cancer: Biology to Therapy - Philadelphia PA 2010
  Miniaturized microscopes for early detection of GI cancers
- **Plenary Address**. Global Research and Development Centers, Seoul S. Korea 2010
  "Accelerating the discovery, development and delivery of new therapies through imaging"
- **Plenary Address**. 20th Anniversary of the Korean Society of Medical Physics 2010
  "Point-of-care Pathology: Can we change the current paradigm of cancer diagnosis
- **Keynote Address.** Innovations in Optical Imaging of Cancer. UT Southwestern 2009
  "A dual biotherapy for elimination of the last cancer cell"
- **Keynote Speaker**: Regenerative Medicine, Advancing next generation therapies 2009
  "Imaging as a window into stem cell biology"
- **Special Seminar.** 2nd International Conference on Medical Physics, Seoul, Korea 2009
  Miniaturized microscopes for early detection of cancer.
- 3rd International Symposium on Animal Molecular Imaging, Taipei, Taiwan 2009
  Refining immune cell therapies through imaging
- **Keynote Speaker**: Chicago Biomedical Consortium Sixth Annual Symposium. 2008
  "Imaging as a window into mammalian biology"
- Lyme and other tick-borne Disease: solutions through cutting edge science, 2008
  College of Physicians and Surgeons of Columbia University.
  "Imaging of infection and the host response"
- **Keynote Speaker:** Bio-inspired Design Conference, Mississippi State University 2008
  "Imaging as a window into mammalian biology"
- **Keynote Address:** International Society of Bioluminescence and Chemiluminescence 2008
  Shanghi, China
- **Distinguished Lecture**: University of California at Davis 2008
- **Keynote Address:** Biophotonics Symposium, CREOL, University of South Florida 2008
- Third AACR International Conference on Molecular Diagnostics in Cancer Therapeutic 2008
  Development: Fulfilling the Promise of Personalized Medicine.
- **Keynote address.** UCSF Cancer Center Annual Retreat 2008
  "Use of imaging to refine a dual biotherapy for cancer"
- Imaging in 2020—Imaging Theragnostics, Jackson Hole WY 2007
  Session Chair: Chemistries of Photoactive Proteins
- Nobel Conference, Stockholm Sweden; Watching Life through Molecular Imaging 2007
  "Imaging Cell Fates and Function"
- **Keynote Address**, Gordon Research Conference "Cancer Models and Mechanisms", 2007
  Les Diablerets, Switzerland
- University of Pennsylvania, Cancer Center Seminar 2007
  Refining small models of cancer through Imaging

- Translation al Optical Molecular Imaging—Nano to Macro, Houston TX 2007
  Bioluminescent markers for studying cell biology in living animals
- University of Pennsylvania, Cancer Center Seminar 2006
  Optimizing cell-based therapies through Imaging
- Joslin Diabetes Center, Harvard University, Departmental Seminar 2006
  Imaging stem cell fates and function
- Siteman Cancer Center of Washington University, programmatic Seminar 2006
  The role of stem cell fusion in hematopoiesis
- Society for Molecular Imaging 2006
  Opening Plenary Lecture: Visualizing stem cell fusion
  Session Chair and State-of-the-art presentation: Visible animal models of neoplasia
- Autumn Immunology Conference (AIC), Imaging Cell Migration 2006
  Enhancing immune cell therapies through imaging
- Sidney Kimmel Cancer Center Symposium 2006
  Optimizing cell-based therapies through Imaging
- Association of American Cancer Institutes (AACI) and Cancer Center Administrators Forum (CAF)Association of American Cancer Institutes (AACI) 2006
  Optimizing cell-based therapies through Imaging: can we eliminate the last cancer cell?
- UCSF, Departmental Seminar Immunology 2006
  Optimizing cell-based therapies through Imaging
- Memorial Sloan Kettering Cancer Center, Departmental Seminar 2006
  Optimizing cell-based Therapies through Imaging
- International Society of Bioluminescence and Chemiluminescence 2006
  In vivo bioluminescence imaging to optimize cell-based therapies
- NTROI, Workshop on Translational Optical Imaging 2005
- University of Oklahoma, Departmental Seminar, Microbiology 2005
  Imaging biological processes in vivo
- UCSF, Departmental Seminar Radiology 2005
  Imaging Stem Cell Fates and Function
- Symposium: Optical Probes For Molecular and Cellular Imaging 2005
  Accelerating and Refining Animal Models through Bioluminescence Imaging
- AACR-NCI-EORTC International Conference Molecular Targets and Cancer Therapeutics: Discovery, Biology, and Clinical Applications 2005
  Plenary Lecture: Optimizing Immune Cell Therapies through Imaging
- BioOptical Symposium, Groningen, Netherlands 2005
  From Stem Cells to Cancer, In vivo Imaging using Bioluminescence
- 3rd Workshop on Innovative Mouse Models in Leiden, Netherlands 2005
  Plenary Lecture: Molecular imaging with bioluminescence: accelerating and refining preclinical studies
- CLEO **Keynote address**: In vivo Cell Biology Using Optics 2005
- FOCIS (Federation of Immunology Societies) 2005
  Plenary address: Visualizing stem cell fates and function
- Keystone Symposium: Leukocyte Trafficking: Cellular and Molecular Mechanisms 2005
  Session Chair: In situ Visualization of Lymphocyte Migration and Activation
  Presentation: Whole Body Imaging of Lymphocyte Trafficking
- FOCIS (Federation of Immunology Societies), Montreal Canada 2004
  Major Symposium: Stem cell tracking and Monitoring
- Society for Molecular Imaging, **Plenary session** on Cell Trafficking and Immunology 2004
  Tracking stem cells in hematopoiesis
- NIAID Biodefense Workshop 2004
  Bioluminescence Imaging for Accelerating Research in Infectious Diseases
- Hwasun Optical Imaging Workshop, Chonnam National University Medical School, Korea 2004
  From Stem Cells to Cancer, In vivo Imaging using Bioluminescence
- *In vivo* Imaging Symposium, Tokyo, Japan 2004
  From Stem Cells to Cancer, In vivo Imaging using Bioluminescence
- Tsukuba University Departmental Seminar 2004
  From Stem Cells to Cancer, In vivo Imaging using Bioluminescence
- University of Texas Southwestern—Departmental Seminar, Dept. of Cell Biology 2004
  Stem cells to cancer: Imaging using bioluminescence
- Pediatric Academic Societies Annual Meeting, **State-of-the-Art presentation** 2004
  Watching hematopoietic stem cell engraftment and hematopoiesis in living animals
- University of Pennsylvania—Chance Laboratory 2004
  Advances in in vivo bioluminescence imaging

- Gordon Conference: Lasers in Biology and Medicine 2004
  Session Chair Molecular targets: from functional imaging to therapy
- International Society of Differentiation, Waikiki, Hawaii 2004
  Shifting foci of hematopoiesis
- AACR Annual meeting 2004
  Immune cell and stem cell trafficking in vivo
- Keystone Symposium: Mouse models of human cancer 2004
  Luciferase-Based Imaging of Mouse Tumor Development
- FASEB Annual meeting; American Association of Anatomists, Whole Body Assessment 2004
  of Cell and Molecular Therapies using *In Vivo* Bioluminescent Imaging
- Levine Symposium on Diabetes 2003
  In vivo Immune cell trafficking
- Annual meeting of the American Association of Veterinary Pathologists 2003
- The 24th Congress of the International Association for Breast Cancer Research 2003
  Imaging of cells fates and function using in vivo bioluminescent imaging
- AACR Annual Meeting 2003
  Bioluminescence Imaging for Cancer Research
- 15th Annual Mahajani Symposium in Molecular Medicine. Salk Institute 2003
  Stem cell fates and function
- European Molecular Imaging Symposium. Roscoff, France; "New in vivo imaging modalities 2003
  for Molecular Biology, Cell Biology and Physiology conference"
  Keynote address: The promise of molecular imaging
- Stem Cell Symposium, Stem Cell Research Foundation 2003
  Assessing Cell Fates and Function In Vivo
- 14th Pezcoller Symposium: Molecular in vivo visualization of cancer cells 2003
  Rovereto, Italy.
- Engineering Conferences International, Advances in optics for biotechnology, medicine 2003
  and surgery Revealing the molecular basis of disease and response to therapy using
  in vivo bioluminescent imaging
- Duke University 2003
  Revealing the molecular basis of disease and response to therapy using
  in vivo bioluminescent imaging
- AAI: American Association of Immunology 2003
  Opening plenary: *In Vivo* Bioluminescent Imaging of Immune Cell Trafficking Patterns.
- Case Western Reserve 2003
  Revealing the molecular basis of disease and response to therapy using
  in vivo bioluminescent imaging
- Keystone symposia on optical imaging 2003
  In vivo molecular and cellular analyses using internal light emitting probes
- FOCIS: Federation of Clinical Immunology Societies 2002
  In Vivo Bioluminescent Imaging of Immune Cell Trafficking Patterns.
- Spanish National Cancer Center, CNIO Conference on Mechanisms of Invasion and Metastasis 2002
  Revealing the molecular basis of malignancy and host response using in vivo
  Bioluminescent measurements
- Jacques Monod Conference on Integrative approaches in pathogenesis 2002
  Pasteur Institute, Paris, France
  -**Symposium organizer, session chair** and speaker
  -Imaging of infection and host response *in vivo*
- Annual meeting of the Society for Molecular Imaging 2002
  - **Member of the steering committee and program committee**
  - **Plenary session chair**
  - Speaker in optical imaging session
  Revealing the molecular basis of disease and response to therapy using
  in vivo bioluminescent imaging
- Boston Children's Hospital, Leading Edge Seminar Series 2002
  Revealing the molecular basis of disease and response to therapy using
  in vivo bioluminescent imaging
- Gordon Conference: Immunobiology and Immunochemistry 2002
  Speaker and Session Chair, Imaging immune cell function *in vivo*
- UCLA Molecular Imaging Seminar Series 2002
  Revealing the molecular basis of disease and host response using *in vivo*
  bioluminescent measurements
- Molecular Imaging in Cancer: Linking Biology Function and Clinical Applications *In Vivo* 2002

In vivo imaging of tumor cells and cells of the immune system
• NIH BECON Meeting on Biosensors 2002
• Pasteur Institute, Paris, France 2001
Imaging of infection *in vivo*
• General Motors Cancer Research Foundation Awards Symposium 2001
Following tumor growth and the immune response *in vivo*
• Imaging in 2020, Jackson Hole, WY 2001
Immune cell trafficking *in vivo*
• DARPA Conference on Biophotonics, Arlington, VA 2001
• NCI Workshop on Molecular Imaging and Cancer Drug Development and Probe Discovery 2001
• International Congress on Neonatal Jaundice, Hong Kong 2001
In Vivo transcription patterns of heme oxygenase-1
• Imaging Life: from Cells to Whole Animals, Microscopy Society of America, Long Beach, CA 2001
Whole body imaging of gene expression and cell migration
• American Society of Gene Therapy Annual Meeting, May 30-June3, 2001
• Imaging 2020, Jackson Hole, WY Sept 30-Oct. 6, 2001
• Society of Pediatric Research National Meeting, Boston, MA 2000
Plenary Address: Monitoring gene expression during development
• International Society for Analytical Cytology, Montpieller, France 2000
Chair: Mini-symposium: Molecular and cellular analyses in living animals
• SPIE Annual Meeting, BiOS'99, San Jose, CA (**Conference Co-chair**) 1999
Conference Title: Molecular imaging: reporters, dyes and instrumentation
Bioluminescent reporters for molecular and cellular analyses in living mammals
• Wellman Laboratories of Photomedicine, Massachusetts General Hospital 1998
Photoproteins as labels for *in vivo* functional imaging
• National Heart and Lung Institute; Imperial College, London 1998
Photoproteins as labels for *in vivo* functional imaging
• International Society of Oxygen Transport, Keynote lecture, Budapest, Hungary 1998
The potential of bioluminescence for *in vivo* oxygen sensors
• Symposium on Biomedical Photonics, German Cancer Research Center, Heidelberg 1998
Bioluminescent reporters for molecular and cellular analyses in living mammals
• Commonwealth Club of California 1998
Discovery in the living organism
• Optical Society of America Meeting, **Symposium Chair** 1997
Genetic engineering optical reporters into living organisms
• Optical Society of America Meeting on Biomedical Optical Spectroscopy and Diagnostics 1996
Photonic monitoring of infectious disease and gene regulation

Membership in Academic Societies

American Association for the Advancement of Science (AAAS)	1986-
American Society of Microbiology (ASM)	1989-1999, 2008-
American Society for Virology (ASV)	1989-1999
International Society for Analytical Cytology (ISAC)	2000-2002
Scientific Advisor for International Congress	
International Society of Bioluminescence and Chemiluminescence (ISBC)	1998-2000
Society for Molecular Imaging (SMI), Charter member	1999-
President elect	2000-2001
President	2002-2003
Member of advisory council	2003-2009
Fellow	2012

Trainees

Current	**Current Position**
Michael Bachmann, MD, D.Sc.	Research Associate
Jonathan Hardy, Ph.D.	Research Associate
Mike Mandella, Ph.D.	Research Associate
Bonnie King, Ph.D.	Instructor
Sophie Kusy, Ph.D.	Postdoctoral Fellow
Tobi Lyn Schmidt, Ph.D.	Postdoctoral Fellow
Steve Sensarn, Ph.D.	Postdoctoral Fellow
HyeJun Ra, Ph.D.	Postdoctoral Fellow
Masamitsu Kanada	Postdoctoral Fellow
Stephan Rogalla	Postdoctoral Fellow

Sander Van Duijnhoven	Postdoctoral Fellow
Laura Bronsart, DVM	Graduate Student, Dept. of Biology
Ellis Garai	Graduate Student, Mechanical Engineering
Nathan Loewke	Graduate Student, Electrical Engineering
Markus Deutchmann	Medical Student
Christian Stokes	Undergraduate research assistant (Trinity University)
Josephine Chen	Undergraduate research assistant
Adithya Balasubramanian	Undergraduate research assistant (Rice University)

Past

Jonathan Liu, Ph.D.	Asst. Prof., SUNY at Stony Brook
Mark Mackanos, Ph.D.	Asst. Prof., Vanderbilt University
Jennifer Prescher, Ph.D.	Asst. Prof., University of California at Irvine
Steve Thorne, Ph.D.	Asst. Prof., University of Pittsburgh
I. Nickolas Olomu, M.D.	Assoc. Prof. ,Michigan State University
Thomas Wang, MD, PhD	Asst. Prof., University of Michigan
Ade Olomu, M.D.	Asst. Prof., Michigan State University
Wibool Piyawattanametha, Ph.D.	Asst. Prof. National Univ. Hosp. and Scientist, Federal Laboratory of Thailand
Mark Sellmyer, Ph.D.	Radiology Resident, UPenn
Yu-An Cao, Ph.D.	Scientist, Origin Pharmaceuticals
Emilio Gonzalez, Ph.D.	Scientist
Tim Doyle, Ph.D.	Sr. Scientist, Dept. Pediatrics at Stanford University
Mike Helms, Ph.D.	Research Scientist, Cenix BioScience
Rajesh Shinde, Ph.D.	Senior Scientist, Abraxis Pharmaceuticals
Weisheng Zhang, Ph.D.	Senior Scientist, Merck Pharmaceuticals.
Steffi Mandl, Ph.D.	Scientist, Exelixis—Komen Fellowship
Pei-Lin Hsiung, Ph.D.	Scientist, Pacific Biosciences
Henry Haeberle, Ph.D.	Director Microscopy Center, Univ. New South Wales
Irfan Ali-Khan, Ph.D.	CEO, Skin Deep Diagnostics
Stacy Burns, Ph.D.	Director of Microbiology, Cobalt Biofuels Inc.
Patrick Eimerman	Director, DNA 2.0
David Bundy, M.D.	Pediatrician Chapel Hill North Carolina
Maneesh Batra, M.D.	Pediatric Fellow, University of Washington
Derek Moore, M.D.	Surgery Resident, Stanford University
Wenchuen Liang, Ph.D.	Research Associate—Stanford University
Blythe Bartos	Medical Student Univ. Chicago
Kathy Fernando	Graduate Student, Cornell University
Brian Eames, Ph.D.	Postdoctoral Fellow UCSF
Anthony Basile	Business
Pamela Dietz	Medical Student, Univ. North Carolina
Patricia Kwon	Medical Student, Johns Hopkins School of Medicine
Wah-Ping Luk	Medical Student
Jon Mathy, M.D.	Surgery Fellow, Harvard University
Christopher Gruber	Medical Student, USC
Karine Gibbs, Ph.D.	Postdoctoral Fellow, Microbiol. & Immunol. Stanford Univ.
Monica Hadjna-Dawson, MD	Staff Physician—Stanford University
Ryan McFarland	Graduate Student, Microbiol. & Immunol. Stanford University
Mary Brindle, M.D.	Surgery Resident, University British Columbia
Hamid Kazerouni, MD	Surgery Resident, Mayo Clinic
Masami Mizubuchi, MD	Staff Physician, Kobe University
Garrett Hefner	Postdoctroal Fellow, Columbia University
Glenn DeSandre, M.D.	Staff Physician, Pacific Medical Center
Jennifer Duda, M.D.	Physician
Hui Zhao, Ph.D.	Research Associate, Stanford University, Dept of Pediatrics
Esther Lee, MS	Research Fellow, Stanford University, Dept. of Medicine.
Mainak Sakar	Graduate Student, Aerospace engineering
Amy Wu	Medical Student, Stanford University
Jayalakshmi Ravindran	Medical Student, UCSF
Jack Perrng	Graduate Student, Physics, Stanford University
Afaarz Irani	Medical Student, Stanford University
Caitlin O'Connel, Ph.D	Research Associate, Stanford University
Maria Fernando, Ph.D.	Scientist, Transderm Inc.

Rinki Kapoor, Ph.D.	Scientist
Jocelyn Ko	Medical Student
Qian Wang, Ph.D.	Postdoctoral Fellow—Neonatal and Developmental Medicine Fellowship; Pediatrics Research Fellowship

Patents:

1. US Pat. 6939533. Filing date: Jun 2, 2005; Issue date: Aug 14, 2007; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
2. US Pat. 6923951. Filing date: Dec, 16, 2002; Issue date: Aug 2, 2005; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
3. US Pat. 6890515. Filing date: Dec, 16, 2002; Issue date: May 10, 2005; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
4. US Pat. 6916462. Filing date: Dec, 16, 2002; Issue date: July 12, 2005; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
5. US Pat. 6908605. Filing date: Dec, 16, 2002; Issue date: June 21, 2005; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
6. US Pat. 6649143. Filing date: Jan 19, 1999; Issue date: Nov 18, 2003; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
7. US Pat. 6217847. Filing date: Jan 19, 1999; Issue date: April 17, 2001; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
8. US Pat. 5650135. Filing date: July 1, 1994; Issue date: July 22, 1997; Non-invasive localization of a light-emitting conjugate in a mammal. Detecting and tracking pathogens in a mammal. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron.
9. US Pat. 6638752; Filing date: Oct 30, 1998; Issue date: Oct 28, 2003; Biodetectors targeted to specific ligands. Inventors: C.H. Contag, P.R. Contag and D.A. Benaron. (1996)
10. US Pat. Pending. Filing date Aug. 2005. Luciferyl peptides. Inventors C. H. Contag, R.R. Shinde, M.D. Bednarski and S. Guccione.
11. US Pat. Pending Filing date: Methods and systems to detect an active protease in a sample. C.H. Contag, R.R. Shinde, J. Perkins.
12. Application number: 11/529,807; Publication number: US 2007/0077231 A1 Filing date: Sep 29, 2006; Immune effector cells pre-infected with oncolytic viruses. Inventors: C.H. Contag, S.H. Thorne
13. US Pat. 7687474; Filing date: Dec 20, 2006; Issue date: Mar 30, 2010; . Nitroreductase enzymes. Inventors: A.C. Matin, Y. Borak, S.H. Thorne, C.H. Contag, J. Rao.
14. US Pat. 12469578 - Filed May 20, 2009; Issue Date: Dec., 2009. Encapsulated nanoparticles for drug delivery. Inventors: C H. Contag; R.R. Shinde.

Publications (Peer Reviewed):

1. Contag, CH, Chan, SP, Wietgrefe, SW and Plagemann, PGW (1986) Correlation between presence of lactate dehydrogenase-elevating virus RNA and antigens in motor neurons and paralysis in infected C58 mice. **Virus Res**. 6(3):195-209.

2. Contag, CH, Retzel, EF and Plagemann, PGW (1986) Genomic differences between strains of lactate dehydrogenase-elevating virus. **Intervirol**. 26:228-233.

3. Harty, JT., Chan, SP, Contag, CH and Plagemann, PGW (1987) Protection of C58 mice from lactate dehydrogenase-elevating virus induced motor neuron disease by non-neutralizing antiviral antibodies without interference with virus replication. **J. Neuroimmun**. 15:195-206.

4. Contag, CH and Plagemann, PGW (1988) Susceptibility to lactate dehydrogenase-elevating virus induced poliomyelitis correlates with increased ecotropic retrovirus expression in motor neurons. **Microb. Path.** 5:287-296.

5. Contag, CH and Plagemann, PGW (1989) Age-dependent poliomyelitis of mice: Expression of endogenous retrovirus in motor neurons predisposes them to infection by lactate dehydrogenase-elevating virus. **J. Virol.** 63(10):4362-4369.

6. Contag, CH, Contag, PR, Mullins, JI, Spilman, SD, Stevenson, DK and Benaron, D (1995) Photonic detection of bacterial pathogens in living hosts. **Molec. Micro**. 18(4): 593-603.

7. Contag, CH, Ehrnst, A, Duda, J Lindgren, S, Bohlin, A.B, and Mullins, JI (1997) Mother-to-infant transmission of human immunodeficiency virus type 1 involving five *env* sequence subtypes. **J. Virol.** 71(2):1292-1300

8. Contag, CH, Spilman, SD, Contag, PR, Oshiro, M, Eames, BF, Dennery, P Stevenson, DK and Benaron, D (1997) Visualizing gene expression in living mammals using a bioluminescent reporter. **Photochem. Photobiol.** 66(4):523-531

9. Tien, PC, Chiu, T, Winters, M, Latif, A, Sunanda, R, Batra, M, Contag, CH, Moore, D, Zejena, L, Mbizvo, M, Delwart, EL, Mullins, JI and Katzenstein, DA (1999) Primary subtype C HIV-1 infection in Harare, Zimbabwe. **J Acquir Immune Defic Syndro Hum Retrovirol** 20:147-153.

10. Sweeney, TJ., Mailander, V, Tucker, A, Olomu, AB, Zhang, W, Cao, Y, Negrin, RS and Contag, CH (1999) Visualizing tumor cell clearance in living animals. **Proc. Natl. Acad. Sci. USA,** 96(21): 12044-49

11. Sweeney, ME, Amanda TJ, Tucker, A, Olomu, AB, Negrin, RS, Contag, CH (1999) Noninvasive Assessment of Tumor Cell Proliferation in Animal Models. **Neoplasia**, 1: 303-310.

12. Siragusa, GR. Nawotka, K, Spilman, SD, Contag, PR, Contag, CH (1999) Real time monitoring of E. coli 0157:H7 adherence to beef carcass surface tissues using a bioluminescent reporter. **Applied and Environmental Microbiology,** 65(4): 1738-1745.

13. Kliks, S, Contag, CH, Wara, D, Corliss, H, Learn, J, Rodrigo, A, Mullins, JI and Levy, JA (2000) Genetic analysis of viral variants selected in maternal transmission of Human immunodeficiency virus to newborns. **AIDS Research and Human Retroviruses.** 16(13): 1223-1233

14. Batra, M, Tien, PC, Shafer, RW, Contag, CH and Katzenstein, DK (2000) HIV-1 envelope sequences from recent seroconverters in Zimbabwe. **AIDS Research and Human Retroviruses** 16(10): 973-9

15. Weng, Y, Tatarov, A, Bartos, BP Contag, CH, Dennery, PA (2000) Bioluminescent and Doxycycline-Regulatable HO-1 Expression in type II pneumocytes via transpulmonary delivery. **Am J Physiol Lung Cell Mol Physiol.** L1273-79.

16. Hugo, GJ, Zijenah, E, Mason P, Contag, CH, Mahomed K, Hendry, M, Katzenstein, D (2000) Prenatal transmission of subtype C HIV-1 in Zimbabwe: HIV-1 RNA and DNA in maternal and cord blood. **J Acquir Immune Defic Syndr.** 15;25(5):390-7.

17. Rehemetulla, A, Stegman, LD, S, Gupta, JC, Hall, S, DE, Contag, CH, Ross, BD (2000). Rapid and quantitative assessment of cancer treatment response using *in vivo* bioluminescence imaging. **Neoplasia** 2(6): 491-495

18. Lipshutz, GS, Gruber, CA, Cao, Y-A, Hardy, J, Contag, CH, Gaensler, KML (2001). In utero delivery of Adeno-associated viral vectors: Intraperitoneal gene transfer produces long-term expression. **Molecular Therapy**. 3(3): 284-292.

19. Nakajima, A, Seroogy, CM, Sandora, ML, Tarner, IH, Costa, GL, Taylor-Edwards, C, Bachmann, MH, Contag, CH, and Fathman, CG (2001). Antigen-specific T cell-mediated gene therapy in collagen-induced arthritis**, J Clin Invest** 107: 1293-301

20. Zhang, W, Feng, JQ, Harris, SE, Contag, PR, Stevenson, DK, Contag, CH (2001) Rapid functional screening of transgenic mice using bioluminescent reporters. **Transgenic Res**. 10 (5):423-434.

21. Costa, G, Sandora, MR, Nakajima, A, Nguyen, EV, Taylor-Edwards, C, Slavin, AJ, Contag, CH, Fathman, CG, Benson, JM (2001) Adoptive immunotherapy of experimental autoimmune encaphalomyelitis via T cell delivery of the interleukin-12 p40 subunit**. J. Immunol.** 167(4): 2379-2387

22. Hamblin, MR, O'Donnell, DA, Murthy, N, Contag, CH, Hasan, T (2002) Rapid control of wound infections by targeted photodynamic therapy monitored by in vivo bioluminescence imaging. **Photochem Photobiol** 75(1): 51-57

23. Lee, SY, Lin, C-K, Contag, CH, Cooper, AD, Sibley, E (2002) Lactase promoter fragments direct differential *in vivo* spatiotemporal expression patterns in transgenic mice. **J. Biol. Chem.** 277(15): 13099-105.

24. Zhang J, Tan X, Contag, CH, Lu Y, Guo D, Harris SE, Feng JQ (2002) Dissection of promoter control modules that direct Bmp4 expression in the epithelium-derived components of hair follicles. **Biochem Biophys Res Commun** 293(5): 1412-9

25. Zhang, W, Contag, PR, Vreman, H, Hajdena-Dawson, M, Wong, RJ, Stevenson, DK, Contag, CH (2002) Selection of potential therapeutics based on *in vivo* spatiotemporal transcription patterns of heme oxygenase. **J. Molec Med**. 80:655-664

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targeted cell therapy in living animals. **Cancer Res.** 62, 5785–5791.

27. Slavin, AJ, Tarner, IH, Nakajima, A, Urbanek-Ruiz, I, McBride, J. Contag, CH**,** Fathman, CG (2002). Adoptive cellular gene therapy for autoimmunity. **Autoimmun Rev**. 1(4):213-219.

28. BitMansour, A Burns, SM, Traver, D, Akashi, Koichi, Contag, CH, Weisman, IL, Brown, JMY (2002). Myeloid progenitors protect against invasive aspergilliosis and *Pseudomonas aeruginosa* infection following hematopoietic stem cell transplantation. **Blood** 100: 4660-7

29. Tarner, IH, Nakajima, A, Seroogy, CM, Ermann, J, Levicnik, A, Contag, CH, Fathman, CG (2002) Retroviral gene therapy of collagen-induced arthritis by local delivery of IL-4**. Clin . Immunol.** 105: 304-14.

30. Wang, TD, Mandella, MJ, Contag, CH and Kino, GS (2003) Dual-Axes Confocal Microscope for High Resolution *In Vivo* Imaging. **Optics Letters**. 28(6): 414-6.

31. Matthias, E, Cao, Y-A, Michael, VR, Bachmann, MH, Contag, CH, Negrin, RS (2003) Revealing lymphoma growth and the efficacy of immune cell therapies using *in vivo* bioluminescence imaging. **Blood** 101: 640 - 648.

32. Edinger, M, Hoffmann, P, Contag, CH, Negrin, RS (2003) Evaluation of effector cell fate and function by *in vivo* bioluminescence imaging. **Methods** 31:172-9.

33. Zhang, W, Purchio, A, Chen K, Burns, SM, Contag, CH, Contag, PR (2003) *In vivo* activation of the human CYP3A4 promoter in mouse liver and regulation by pregnane X receptors. **Biochem Pharmacol** 65:1889-96.

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35. Wang, TD, Contag, CH, Mandella, MJ, Chan, NY, Kino, GS (2003) Dual axes confocal microscopy with post objective scanning and low-coherence heterodyne detection. **Optics Letters** 28(20): 1915-1917

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37. Lipshutz, GS, Titre D, Brindle, M, Bisconte AR, Contag, CH, Gaensler, KM (2003) Comparison of gene expression after intraperitoneal delivery of AAV2 or AAV5 *in utero.* **Mol Ther**. 8(1): 90-8.

38. Hambin, MR, Zahra T, Contag, CH, McManus, AT, Hasan, T (2003) Optical monitoring and treatment of potentially lethal wound infections in vivo. **J Infect Dis.** 1;187(11):1717-25.

39. Hajdena-Dawson, M, Zhang, W, Contag, PR, Vreman, HJ, Wong, RJ, Stevenson, DK, Contag, CH (2003) Potential therapies for hyperbilirubinemia affect transcription of heme oxygenase. **Molec. Imaging.** 2(3): 138-149

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41. Wang, TD, Mandella, MJ, Contag, CH, Kino, GS (2004) Dual Axes Confocal Fluorescence Microscope for *In Vivo* Molecular and Cellular Imaging. **J. Biomed Optics**. 9:735-742.

42. Hardy, JK, Chu, P, Gibbs, K, Contag, CH (2004) Extracellular Replication of *Listeria monocytogenes* in the Bladder, MG. **Science**. 303(5659): 851-853

43. Cao, Y-A, Wagers, AB, Dusich, J, Bachmann, MH, Negrin, RS, Weisman, IL, Contag, CH (2004) Shifting foci of hematopoeisis during reconstitution from single stem cells. **Proc. Natl. Acad. Sci. USA**. 101(1):221-226.

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