

CURRICULUM VITAE

Subhashini Chandrasekharan, PhD

IGSP Center for Genome Ethics Law and Policy
Phone: 919-684-0417, Email: shubha.c@duke.edu

EDUCATION

PhD Genetics and Molecular Biology, 2001, University of North Carolina at Chapel Hill, NC, USA
Curriculum in Genetics & Molecular Biology, University of North Carolina, Chapel Hill

MSc. (Honors) Biology 1993, Birla Institute of Technology & Science, Pilani, India

RESEARCH EXPERIENCE

Senior Research Associate, Center for Genome Ethics Law and Policy, IGSP, Duke University 11/1/2008 – present

Post-doctoral Research Associate, Center for Public Genomics (CPG), IGSP, Duke University 10/1/2006 – 10/2008
Mentor: Robert Cook-Deegan M.D.

Post-doctoral Research Associate, Dept of Genetics, UNC-Chapel Hill 7/2001 – 9/2006

Defining the biological function of PGE₂ in normal mammary gland physiology and tumorigenesis using transgenic and gene knockout mice for PGE₂ metabolism enzymes and receptors

Mentor: Beverly H. Koller PhD

Doctoral Student, Curriculum in Genetics and Molecular Biology, UNC- Chapel Hill 12/1995- 5/2001

Dissertation: Targeted Disruption of the Non-Receptor-Tyrosine Kinase, *Frk*.

Generated and characterized mice deficient in the src-like epithelial tyrosine kinase *Frk/rak*

Mentor: Edison T. Liu M.D.

Research Assistant, Department of Microbiology, SUNY Buffalo, NY 7/1993 – 7/1994

MSc. (Honors) Thesis Training Program BITS Pilani 1/93- 6/93

Functional *in vitro* characterization of the VZV ORF 63 gene product

Advisor: John Hay PhD

GRANTS & FELLOWSHIPS

1 R03 HG005026-01 4/1/2009 – 3/31/2012

NHGRI, NIH

Title: Intellectual Property Challenges for the Development of Genomic Diagnostics

Role: Principal Investigator (PI)

Co-investigators: Robert Cook-Deegan, Arti K Rai

Josiah Charles Trent Memorial Foundation, 5/15/08- 5/14/09

Title: Access to Cervical Cancer Vaccines - An Analysis of Technical Legal, Regulatory and Societal Challenges in India.

Role: Project Director

Principal Investigator: Robert Cook-Deegan

Department of Defense Breast Cancer Postdoctoral Training Grant, 5/ 03- 10/06

Hoechst Callnesse Fellowship, 8/94 – 8/95 Awarded by Hoechst Callnesse Inc. for Merit, Curriculum in Genetics and Molecular Biology, UNC-Chapel Hill

ACADEMIC HONORS

National Talent Search Scholar, 1987 - 93 Awarded by the Government of India for Academic Excellence

PEER REVIEWED PUBLICATIONS

Padmanabhan S, Amin T, Sampat B, Cook-Deegan R, **Chandrasekharan S**. Intellectual Property, Technology Transfer and Developing Country Manufacture of Low-cost HPV vaccines in India. 2010. *Nat Biotechnol*. 7:671-8

Carbone J, Gold ER, Sampat B, **Chandrasekharan S**, Knowles L, Angrist M, Cook-Deegan R. DNA patents and diagnostics: not a pretty picture. 2010. *Nat Biotechnol*. 8:784-91

Chandrasekharan S, Heaney C, James T, Conover C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for cystic fibrosis. 2010. *Genet Med*. Apr;12 (4 Suppl):S194-211

Chandrasekharan S, Fiffer M. Impact of gene patents and licensing practices on access to genetic testing for hearing loss. 2010. *Genet Med*. Apr;12 (4 Suppl):S171-93.

Chandrasekharan S, Pitlick E, Heaney C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for hereditary hemochromatosis. 2010. *Genet Med*. Apr;12 (4 Suppl):S155-70

Angrist M, **Chandrasekharan S**, Heaney C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for long QT syndrome. 2010. *Genet Med*. Apr;12 (4 Suppl):S111-54

Powell A, **Chandrasekharan S**, Cook-Deegan R. Spinocerebellar ataxia: patient and health professional perspectives on whether and how patents affect access to clinical genetic testing. 2010. *Genet Med*. Apr;12 (4 Suppl):S83-S110

Colaianni A, **Chandrasekharan S**, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing and carrier screening for Tay-Sachs and Canavan disease. 2010. *Genet Med*. Apr;12 (4 Suppl):S5-S14

Cook-Deegan R, DeRienzo C, Carbone J, **Chandrasekharan S**, Heaney C, Conover C. Impact of gene patents and licensing practices on access to genetic testing for inherited susceptibility to cancer: comparing breast and ovarian cancers with colon cancers. 2010. *Genet Med*. Apr;12 (4 Suppl):S15-38

Chandrasekharan S, Kumar S, Valley CM, Rai A. Proprietary science, open science and the role of patent disclosure: the case of zinc-finger proteins. 2009. *Nature Biotechnol*. 27(2): 140-44

Cook-Deegan R, **Chandrasekharan S**, Angrist M. The dangers of diagnostic monopolies. 2009. *Nature* 58(7237):405-406

Jania LA, **Chandrasekharan S**, Backlund MG, Foley NA, Snouwaert J, Wang IM, Clark P, Audoly LP, Koller BH. Microsomal prostaglandin E synthase-2 is not essential for in vivo prostaglandin E2 biosynthesis. 2009 *Prostaglandins Other Lipid Mediat*. 88(3-4):73-81.

Jason I Herschkowitz, Karl Simin, Victor J. Weigman, Igor Mikaelian, Zhiyuan Hu, Karen E. Rasmussen, Laundette P. Jones, Shahin Assefina, **Subhashini Chandrasekharan**, Michael G. Backlund, Yuzhi Yin et al. Identification of conserved gene expression features across human and murine mammary tumors. 2007. *Genome Biology*. 8(5):R76.

Subhashini Chandrasekharan, Nicholas A. Foley, Leigh Jania, Laurent P. Audoly and Beverly H. Koller Coupling of COX-1 to mPGES1 for prostaglandin E₂ biosynthesis in the murine mammary gland. 2005. *J Lipid Res*.46: 2636-48.

Michael Welsh, Charlotte Welsh, Maria Ekman, Johan Dixelius, Robert Hägerkvist, Cecilia Annerén, Björn Åkerblom, Siavosh Mahboobi, **Subhashini Chandrasekharan**, and Edison T. Liu. The FRK/RAK tyrosine kinase participates in cytokine-induced islet cell toxicity. 2004. *Biochem J*. 382(Pt 1): 261-8.

Subhashini Chandrasekharan, Tinghu Qiu, Nawal Alkharouf, Kelly Brantley, James B. Mitchell and Edison T. Liu Characterization of Mice deficient in the Src family Non-Receptor Tyrosine Kinase *Frk/rak* 2002. *Mol Cell Biol.* 22(14): 5235-47.

Jang-Ming Li, Michael A. Nichols, **Subhashini Chandrasekharan**, Yue Xiong and Xia Fan Wang Transforming Growth Factor β Activates the Promoter of Cyclin-Dependent Kinase Inhibitor p15^{INK4B} Through an SP-1 Consensus Site.1995. *J Biol. Chem.* 270(45): 26750-3.

Case Studies for the Secretary's Advisory Committee of Genetics Health and Society

Topics for these case studies were chosen in close consultation with the SACGHS Task Force, revised repeatedly, subjected to independent external peer and technical review by the SACGHS staff, and published in a supplement in Genetics in Medicine.

Chandrasekharan S, Fiffer M. Impact of gene patents and licensing practices on access to genetic testing for hearing loss. Peer-reviewed case study commissioned by the Secretary's Advisory Committee on Genetics, Health, and Society (SACGHS); Released for public comment 2009 March 3. Available from:

http://oba.od.nih.gov/SACGHS/sacghs_documents.html

Chandrasekharan S, Heaney C, James T, Conover C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for cystic fibrosis. Peer-reviewed case study commissioned by the Secretary's Advisory Committee on Genetics, Health, and Society (SACGHS); Released for public comment 2009 March 3. Available from:

http://oba.od.nih.gov/SACGHS/sacghs_documents.html

Chandrasekharan S, Pitlick E, Heaney C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for hereditary hemochromatosis. Peer-reviewed case study commissioned by the Secretary's Advisory Committee on Genetics, Health, and Society (SACGHS); Released for public comment 2009 March 3. Available from:

http://oba.od.nih.gov/SACGHS/sacghs_documents.html

Angrist M, **Chandrasekharan S**, Heaney C, Cook-Deegan R. Impact of gene patents and licensing practices on access to genetic testing for Long QT syndrome. Peer-reviewed case study commissioned by the Secretary's Advisory Committee on Genetics, Health, and Society (SACGHS); Released for public comment 2009 March 3. Available from:

http://oba.od.nih.gov/SACGHS/sacghs_documents.html

Invited Articles, Book Chapters and Reports

Chandrasekharan S, Cook-Deegan R. Gene patents and personalized medicine - what lies ahead? 2009.

[*Genome Medicine* 1\(9\):92.](#)

Chandrasekharan S., Perin N.C., Wiechers I.R., and Cook-Deegan, R. Public-Private Interactions in Genomic Medicine: Research and Development In: *Genomic and Personalized Medicine*, editors Willard HF, Ginsburg GS, (NY: Elsevier, 2008), pp. 434-444

Description available from: http://www.elsevier.com/wps/find/bookdescription.cws_home/716375/description#description

Selected Presentations

Subhashini Chandrasekharan and Cristina Capustij. **Intellectual property challenges for the development of novel genomic diagnostics- An emerging picture**

ELSI Congress, UNC-Chapel Hill, North Carolina, April 12, 2011.

Subhashini Chandrasekharan and Swathi Padmanabhan. **Harnessing University Technology Transfer to Increase**

Global HPV Vaccine Access.

Access to HPV Vaccines Symposium: Human Rights and Global Health, BU School of Law, Boston, Massachusetts, USA February 7, 2009

Subhashini Chandrasekharan, Eric Jiang and Alex Cho. **Intellectual Property and Genomic Diagnostics for Type II Diabetes.**

Personal Genomes Cold Spring Harbor Meeting, Cold Spring Harbor New York, October 2008

Subhashini Chandrasekharan and Robert Cook-Deegan Intellectual Property Challenges for Development of Multi-gene Diagnostic Tests

Platform presentation, **American Society of Human Genetics Annual Meeting**, November 14, 2008

Subhashini Chandrasekharan Patents and Licensing and Access to Genetic Testing in the US

Invited presentation and panel discussant

Translating Ethical, Legal and Social Implications of Genomic Research

International conference, Cleveland, Ohio, May 1-3, 2008

Carla Rydholm, **Subhashini Chandrasekharan** and Robert Cook-Deegan The impact of University Licensing Practices and DNA-based patents on Genetic Testing access, Poster presentation

Changing Horizons, Association of University Technology Managers, Annual Meeting, San Diego, California, USA, February 28- March 1 2008

Subhashini Chandrasekharan, Nicholas A. Foley, Leigh Jania, Laurent P. Audoly and Beverly H. Koller The Role of Prostaglandin E₂ in the Normal development and Mammary Epithelial Transformation, Poster presentation

DOD Era of Hope Breast Cancer Research Program Meeting, Philadelphia, PA, USA, June 2005

Subhashini Chandrasekharan, Nicholas A. Foley, Beverly H. Koller. The Role of Prostaglandin E₂ in the Normal development and malignant Transformation of Mammary Epithelium, Poster presentation

Advances in Breast Cancer Research, Genetics, Biology and Clinical Implications, AACR Special Conference, Huntington Beach, CA, USA, October 2003

PROFESSIONAL TRAINING

- **Bioethics Training, Intensive Bioethics Course 33: Decision making in the 21st century**, June 4-9 2007, Kennedy Institute of Bioethics, Georgetown University
- **Workshop on Genetics, Evolution and Cognitive ability** June 11-12, 2007, organized by the Center for Integration of Research on Genetics and Ethics, Stanford Center for Biomedical Ethics.
- **NHGRI Training Workshop on ELSI Grant Writing** October 17, 2007. NIH, Bethesda.
- **Leadership Training Certification, Center for Creative Leadership UNC Leadership Symposium**, June 2006, UNC-Chapel Hill
- **Grant Writing Symposium for Biological & Physical Sciences**, June 2005, UNC- Chapel Hill
Participated in an NIH R01 grant proposal peer-review mock study section exercise
- **Management Strategies: Building a Foundation for Success**, June, 2003 UNC-Chapel Hill

TEACHING

- Instructor, **Cancer Biology BIO445** University of North Carolina Chapel Hill, May12- June 15 2009,
- Teaching assistant, **PUBPOL240 Responsible Genomics**, Duke University 1/2007- 5 /2007

- **BIO98**, Undergraduate Research Project, Mentor, UNC-Chapel Hill 8/2003 –12/2003 & 12/2004- 5/2004
- **Guest Lectures**
 Duke University, PUBPOL 240, Responsible Genomics, May 2007
 Topic: **Genomics and Global Health**

 Duke University, LEAP Summer Program, July 2007
 Topic: **Breast Cancer Therapy**

 UNC-Chapel Hill, GEN 113, Core course, Curriculum of Genetics and Molecular Biology- 4/2004, 4/2005
 North Carolina Central University 4/2005, 4/2006
 Topic: **Mouse Models for Cancer**

SERVICE

- **Coordinator, IGSP, Science and Society Journal Club**, Duke University, November 2007- present. Initiated and currently help co-ordinate this monthly journal club at IGSP
- **Instructor, Responsible Conduct of Research Course**, Trent Center for Bioethics, Duke University September 2009
- **Guest lecturer, Responsible Conduct of Research training, IGSP Dept of Computational Biology and Bioinformatics**, September 18, 2009 & September 20 2008.
- **Invited Panelist “Altruistic Careers” Women in Science and Engineering** , Duke University, March 21, 2008