

CURRICULUM VITAE

NAME: Siddharth Balachandran

ADDRESS: Fox Chase Cancer Center
333 Cottman Avenue
Philadelphia, PA 19111

EDUCATION:

Angelo State University, San Angelo, TX, B.S., Chemistry, 1995
Emory University, Atlanta, GA, Ph.D., Immunology & Molecular Pathogenesis, 2001

PROFESSIONAL EXPERIENCE:

University of Miami Miller School of Medicine, Miami, FL, Postdoctoral Research Associate, Department of Microbiology & Immunology,	2001-2005
University of Miami Miller School of Medicine, Miami, FL, Research Assistant Professor, Department of Microbiology & Immunology,	2005-2007
Institute for Cancer Research, Fox Chase Cancer Center, Philadelphia, PA, Associate Member	2007-date

TEACHING EXPERIENCE:

Emory University, Atlanta, GA, Virology/Immunology Course	1996-1998
University of Miami, Miami, FL, Virology/Immunology Course	2005-2006

SOCIETIES:

International Society for Interferon and Cytokine Research
American Association for Cancer Research

FELLOWSHIPS, HONORS, AWARDS

Young Investigator of the Year, International Society for Interferon & Cytokine Research	2000
Best Student Research, Eastern Student Research Forum	2000
First Prize, Zubrod Annual Poster Competition, University of Miami	2005

SOLICITED REVIEWS & TECHNICAL ARTICLES:

Balachandran, S., Barber, G.N. PKR in innate immunity, cancer, and viral oncolysis. *Methods Mol. Biol.* **383**:277-301, 2007.

INVITED LECTURES:

Temple University, Philadelphia, PA 1/2009

PREDOCTORAL/POSTDOCTORAL TRAINEES:

Suresh Basagoudanavar, Ph.D., Postdoctoral Associate 2007-
Ph.D., Animal Biotechnology, Indian Veterinary Research Institute,
Izatnagar, India

Mathilde Poussin, Ph.D., Postdoctoral Associate 2007-
Ph.D., Enzymatic Engineering Bioconversion and Microbiology,
Université de Picardie Jules Verne, Amiens, France

RESEARCH INTERESTS:

The mammalian innate immune system provides an important first line of defense against a variety of pathogens such as viruses, bacteria and fungi. A key component of mammalian innate immunity against viruses is a family of cytokines called the interferons (IFNs, so called because they 'interfere' with virus replication). The IFNs are classified into two groups, type I and type II. Type I (α/β) IFNs are produced by most cell types and respond to viral infection, whereas type II IFN (called IFN- γ) is made by a select subset of immune system cells and is not virus inducible.

Our laboratory is interested in the mechanisms by which the IFNs exert their anti-viral and anti-proliferative effects. The IFNs mediate their activities via the induction of several hundred genes, many of which are of unknown function. A primary interest of this laboratory is to characterize such genes functionally. Additionally, we have recently identified a novel pathway by which the IFNs induce cell death and are currently elucidating this mechanism.

PUBLICATIONS:

Balachandran, S., Kim, C.N., Yeh, W.-C., Mak, T.W., Bhalla, K., Barber, G.N. Activation of the dsRNA-dependent protein kinase, PKR, induces apoptosis through FADD-mediated death signaling. *EMBO J.* **17**:6888-6902, 1998.

Balachandran, S., Roberts, P.C., Kipperman, T., Bhalla, K.N., Compans, R.W., Archer, D.R., Barber, G.N. Alpha/beta interferons potentiate virus-induced apoptosis through activation of the FADD/Caspase-8 death signaling pathway. *J. Virol.* **74**:1513-1523, 2000.

Heylbroeck, C., **Balachandran, S.**, Servant, M., DeLuca, C., Barber, G.N., Lin, R., Hiscott, J. The IRF-3 transcription factor mediates Sendai virus-induced apoptosis. *J. Virol.* **74**:3781-3792, 2000.

Balachandran, S., Roberts, P.C., Brown, L.E., Truong, H., Pattnaik, A.K., Archer, D.R., Barber, G.N. Essential role for the dsRNA-dependent protein kinase PKR in innate immunity to viral infection. *Immunity* **13**:129-141, 2000.

Balachandran, S., Barber, G.N. Vesicular Stomatitis Virus (VSV) therapy of tumors. *IUBMB Life* **50**:135-138, 2000.

PUBLICATIONS (continued):

- Ezelle, H.J., **Balachandran, S.**, Sicheri, F., Polyak, S.J., Barber, G.N. Analyzing the mechanisms of interferon-induced apoptosis using CrmA and hepatitis C virus NS5A. *Virology* **281**:124-137, 2001.
- Balachandran, S.**, Porosnicu, M., Barber, G.N. Oncolytic activity of vesicular stomatitis virus is effective against tumors exhibiting aberrant p53, Ras, or myc function and involves the induction of apoptosis. *J. Virol.* **75**:3474-3479, 2001.
- Saunders, L.R., Perkins, D.J., **Balachandran, S.**, Michaels, R., Ford, R., Mayeda, A., Barber, G.N. Characterization of two evolutionarily conserved, alternatively spliced nuclear phosphoproteins, NFAR-1 and -2, that function in mRNA processing and interact with the double-stranded RNA-dependent protein kinase, PKR. *J. Biol. Chem.* **276**:32300-32312, 2001.
- Grandvaux, N., Servant, M.J., tenOever, B., Sen, G.C., **Balachandran, S.**, Barber, G.N., Lin, R., Hiscott, J. Transcriptional profiling of interferon regulatory factor 3 target genes: direct involvement in the regulation of interferon-stimulated genes. *J. Virol.* **76**:5532-5539, 2002.
- Pataer, A., Vorburget, S.A., Barber, G.N., Chada, S., Mhashilkar, A.M., Zou-Yang, H., Stewart, A.L., **Balachandran, S.**, Roth, J.A., Hunt, K.K., Swisher, S.G. Adenoviral transfer of the melanoma differentiation-associated gene 7 (mda7) induces apoptosis of lung cancer cells via up-regulation of the double-stranded RNA-dependent protein kinase (PKR). *Cancer Res.* **62**:2239-2243, 2002.
- Balachandran, S.**, Barber, G.N. Defective translational control facilitates vesicular stomatitis virus oncolysis. *Cancer Cell* **5**:51-65 2004.
- Balachandran, S.**, Thomas, E., Barber, G.N. A FADD-dependent innate immune mechanism in mammalian cells. *Nature* **432**:401-405, 2004.
- Pataer, A., Vorburget, S.A., Chada, S., **Balachandran, S.**, Barber, G.N., Roth, J.A., Hunt, K.K., Swisher, S.G. Melanoma differentiation-associated gene-7 protein physically associates with the double-stranded RNA-activated protein kinase PKR. *Mol. Ther.* **11**:717-723, 2005.
- Balachandran, S.**, Venkataraman, T., Fisher, P.B., Barber, G.N. Fas-associated death domain-containing protein-mediated antiviral innate immune signaling involves the regulation of Irf7. *J. Immunol.* **178**:2429-2439, 2007.
- Goodman, A.G., Smith, J.A., **Balachandran, S.**, Perwitasari, O., Proll, S.C., Thomas, M.J., Korth, M.J., Barber, G.N., Schiff, L.A., Katze, M.G. The cellular protein P58IPK regulates influenza virus mRNA translation and replication through a PKR-mediated mechanism. *J. Virol.* **81**:2221-2230, 2007.
- Radtke, A.L., Delbridge, L.M., **Balachandran, S.**, Barber, G.N., O’Riordan, M.X. TBK1 protects vacuolar integrity during intracellular bacterial infection. *PLoS Pathog.* **3**:e29, 2007.
- Balachandran, S.**, Barber, G.N. PKR in innate immunity, cancer, and viral oncolysis. *Methods Mol. Biol.* **383**:277-301, 2007.
- Wang, X., Wang, J., Hopewell, E.L., Hussain, S., **Balachandran, S.**, García-Sastre, A., Beg, A.A. An essential cell-type specific requirement for IKK β /NF- κ B in virus-induced IFN expression in plasmacytoid dendritic cells. *Proc. Natl. Acad. Sci. USA* (In press).