

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Krishnakumar Balasubramanian	POSITION TITLE Assistant Professor		
eRA COMMONS USER NAME kbalasub			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Bombay, INDIA	B.Sc.	1987	Chemistry/ Biochemistry
Indian Institute of Technology, Bombay, INDIA	M.Sc.	1989	Biotechnology
Institute of Microbial Technology, Chandigarh, INDIA	Ph.D.	1997	Membrane Biology
U.T. M.D. Anderson Cancer Center	PDF	1996-1998	Apoptosis & Phagocyte biology

**A. Positions and Honors**

Associate Member of the Graduate Faculty, Graduate School of Biomedical Sciences, The University of Texas Health Science Center, Houston, TX 2006-

Assistant Professor, The University of Texas M.D. Anderson Cancer Center, Houston, TX 2002-present

Research Associate, The University of Texas M.D. Anderson Cancer Center, Houston, TX 1998-2002

**B. Selected Peer-reviewed Publications (in chronological order)**

Patents filed: May 2002: Beta-2-Glycoprotein I is an inhibitor of angiogenesis.

Publications:

Krishnakumar Balasubramanian, Banafsheh Mirnikjoo, Alan J Schroit. Regulated externalization of phosphatidylserine at the cell surface: Implications for apoptosis. (submitted).

Sourindra N Maiti, Krishnakumar Balasubramanian, Johanna Ramoth and Alan J Schroit. Macrophage cell surface LRP family member(s) mediate Beta-2 Glycoprotein 1 dependent apoptotic cell clearance. (in preparation).

Taro Sakai, Krishnakumar Balasubramanian, Sourindra Maiti, Jyotsana B. Halder, Daniel Cohen and Alan J. Schroit. Antiangiogenic activity of plasmin-cleaved beta-2-glycoprotein 1. (in preparation).

Krishnakumar Balasubramanian Sourindra N. Maiti Alan J. Schroit. Recruitment of beta-2-glycoprotein 1 to cell surfaces in extrinsic and intrinsic apoptosis. Apoptosis. 10:439-46, (2005).

Krishnakumar Balasubramanian and Alan J. Schroit. Aminophospholipid Asymmetry: A Matter of Life and Death Annu.Rev.Physiol. 65:701-734 (2003)

Krishnakumar Balasubramanian and Alan J. Schroit. Characterization of Phosphatidylserine-dependent Beta-2-Glycoprotein I Macrophage Interactions. Implications for apoptotic cell clearance by macrophages, J.Biol.Chem. 273: 29272- 29277, (1998)

Krishnakumar Balasubramanian, Joya Chandra, and Alan J. Schroit. Immune Clearance of Phosphatidylserine-expressing cells by phagocytes. The role of Beta-2-Glycoprotein I in macrophage recognition, J.Biol.Chem. 272: 31113-31117, (1997)

Krishnakumar Balasubramanian, Edouard M. Bevers, George M. Willems, Alan J. Schroit. Binding of annexin v to membrane products of lipid peroxidation. Biochemistry 40:8672-6, (2001)

Derek Dombroski, Krishnakumar Balasubramanian, Alan J. Schroit. Phosphatidylserine expression on cell surfaces promotes antibody- dependent aggregation and thrombosis in Beta-2-glycoprotein I-immune mice. J. Autoimmun. 14:221-9, (2000)

Edouard M.Bevers, Marie P.Janssen, Paul Comfurius, Krishnakumar Balasubramanian, Alan J.Schroit, Robert F.A.Zwaal and George M.Willems. Quantitative determination of the binding of beta2-glycoprotein I and prothrombin to phosphatidylserine-exposing blood platelets. Biochemical Journal. 386:271-9, (2005).

Anh T. Lee, Krishnakumar Balasubramanian, Alan J. Schroit. Beta-2-glycoprotein I-dependent alterations in membrane properties. Biochim.Biophys.Acta. 1509:475-84, (2000)

Cecilia Diaz, Krishnakumar Balasubramanian and Alan Schroit. Synthesis of Disulfide containing phospholipid analogs for the preparation of head group-specific lipid antigen: Generation of phosphatidylserine antibodies, Bioconjug.Chem. 9(2):250-254, (1998)

### **C. Research Support (last 3 years)**

#### **Institutional Research Grant (2005-2006)**

Project title: Differential expression of phagocyte ligands on apoptotic cells.

Principle Investigator: Krishnakumar Balasubramanian.

Objectives: Phosphatidylserine is considered a critical signal for apoptotic cell recognition. While this lipid is crucial for phagocytosis, recent reports have also developed support for the existence of other molecules that play an equally important role in this process. It is now believed that engulfment of apoptotic cells is triggered by the appearance of specific "eat-me" signals and the disappearance of "don't eat me signals" that help phagocytes distinguish between normal and dying cells. Furthermore, many of these signals are sequestered in lipid rafts such that they become inaccessible to the phagocyte until the cells undergo apoptosis. This proposal seeks to identify cell surface molecules that help the phagocytes distinguish apoptotic from healthy viable cells. These studies will provide a better understanding of the signaling molecules on cells that are vital to phagocytosis, and hence, for a successful conclusion of the cell death program.

#### **Pending grants (submitted)**

Regulation of plasma membrane lipid asymmetry by intracellular calcium homeostasis

Amount: \$ 318,546 Role: PI Awarding agency: National Science Foundation.