Anirban Banerjee, Ph.D.

Education & Training

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Indian Institute of Technology, India	B.S.	1979	Chemistry
University of Rochester, Rochester, NY.	M.S.	1981	Bio-Organic Chemistry
Syracuse University, Syracuse, NY	Ph.D.	1985	NMR/Biophysics

Positions and Employment

1979 - 1981 Research and Teaching Assistant, University of Rochester

1981 - 1985 Research Fellow, Syracuse University

1986 - 1992 Assistant Professor, Departments of Medicine and Surgery, University of Colorado at Denver Health Sciences Center

1986 - 1997 Operations Director, Joint NMR Facility, University of Colorado Health Science Center

1992 - 2004 Associate Professor, Department of Surgery, University of Colorado Health Science Center

2003 - present Program Director P50 GM4922 Trauma Primes Cells.

2004 - present Professor, Department of Surgery, University of Colorado Health Sciences Center

Other experience and Professional memberships

1997 present Member, American Physiological Society

2002 present Member Shock Society

1997 present Ad hoc reviewer NIH

2009 present Editorial Board, Shock Society

2009 present Ad hoc reviewer DOD

2012 present Councillor Shock Society

Research Support:

ONGOING

5 P50 GM049222

Program Director: Banerjee , A. Ph.D.

Granting Agency: NIGMS P-50 (Center grant)

Funding Period: 7/01/17 – 06/30/18

Amount $1,004,000

"Trauma Primes Cells"

This Center is directed to examining the systematics of how traumatic shock induces inflammation at multiple levels (viz. molecular, cellular and patients). The three specific research projects of this Center address **i.** toxicity of mesenteric lymph after hemorrhagic shock, **ii.** Trauma induced coagulopathy, **iii.** the role of HTS in reducing lung inflammation .The Center is supported by three Cores: **I.** An Administration Core that provides internal support and outreach, **II.** a Human Subjects Core that mines clinical data and tissue samples. **III.** a Cell & Imaging and Proteomics Core that provides an array of cell phenotypes (donors, patients transformed), multi channel fluorescence imaging and FRET localization in cells and tissues, and MS proteomics. We have recently added elaborate MS metabolomics capability.

Role: Principal Investigator for the P50 Center Grant, and PI for Administration Core, as well as Cell & Imaging Core and Project 3. I am principally responsible for basic science leadership, as well as all financial and compliance accountability

W81XWH1220028

Principal Investigator: Moore, E. E., M.D.

Co-Investigator: Banerjee, A., Ph.D.

Granting Agency: DOD/ USAMRAA

Funding Period: 07/20/12 – 02/19/18

Amount: $6,666,500

"A Prospective, Randomized Investigation of "Plasma First Resuscitation" for Traumatic Hemorrhage and Attenuation of the Acute Coagulopathy of Trauma"

Also known as, "Control of Major Bleeding after Trauma (COMBAT)"

This is one of three nationally funded RCTs. This project's goal is to determine if administering thawed plasma in the field to severely injured patients will reduce trauma-induced coagulopathy (TIC); and thereby, reduce transfusion requirements, improve

metabolic recovery, and improve survival.

Role: Co-Investigator. I am the primary responsible for data interpretation, final reports and financial fidelity to the contract.

5 UM 1HL120877

Principal Investigator: Mann, K. G. M.D.

Project Leader: Banerjee, A., Ph.D.

Granting Agency: NHLBI UM-1, DOD (multi institutions)

Funding Period: 07/20/13 – 02/19/18

Amount: $2,300,000 (for UCD project)

NIH/NHLBI

"Analysis and Characterization of Trauma-Induced Coagulopathy"

This is a Trans-Agency Research Consortium for Trauma-Induced Coagulopathy (TACTIC) grant. The global objective is to elucidate the mechanisms driving trauma induced coagulopathy. The Denver Projects (Project 5 and 7) study fibrinolysis, platelet dysfunction, thromboelastography.
Role: Project Leader (Project 5: Impaired ADP Inducible Platelet Activation after Major Trauma). This investigates platelet dysfunction in Trauma induced Coagulopathy (TIC). I am the primary responsible for data financial fidelity to all projects involving the University of Colorado Denver (Project 5, 6, 7). The goal of Project 5 is to investigate the mechansisms fo platelet dysfunction aafter shock and trauma.
Co-Investigator: Project 7: Clinical Platforms for Assessment of Coagulation

Published Work
http://www.ncbi.nlm.nih.gov/sites/myncbi/anirban.banerjee.1/bibliography/46036209/public/?sort=date&direction=ascending

Reserqch Interests

1. **Signaling and Adaptation**. My early publications concerned cardiac ischemia reperfusion injury. This quickly led to receptor signaling paradigms for myocardial preconditioning. I was the first to propose and demonstrate a role of PKC isoforms in this phenomenon. After 1998, I discarded this line of research as I became disappointed by the limited therapeutic applicability in aged patients.

2. Bioenergetics Shock metabolism generalizes ischemia reperfusion to the whole body. There appear to be many conserved adaption strategies that can be quantitated and augmented. A far from equilibrium thermodynamics picture of tissue mitochondria is mathematically and physiologically useful. MS metabolomics on human and animal samples provides a novel window into post shock sequlae.

3. **Protein-protein interaction and traffic in cells** Quantitative fluorescence imaging. FRET easily tackles non-destructive localization of molecular complexes. I amd interested in nuclear traffic of transcription factors that drives inflammation. MS proteomic and metabolomics can be combined with affinity methods to yield molecular insights into the extreme conditions of hemorrhagic shock.

4. **Hypertonic therapy** A first consequence of ischemia reperfusion involves cellular ion and osmolyte changes. Humans have evolved near seas, and osmolarity appears to affect inflammatory signaling and gene regulation. This area is clinically relevant.

5. **Trauma induced coagulopathy:** Rapid point of care measurements translates to judicious transfusion and resuscitation. MS proteomic and metabolomics can be combined with other methods to yield molecular insights into the extreme conditions of hemorrhagic shock.