BIOGRAPHICAL SKETCH

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NAME: Sarkar, D.K

eRA COMMONS USER NAME (credential, e.g., agency login): DSARKAR

POSITION TITLE: Distinguished Professor and Director

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Calcutta University INDIA	B.S.	05/1970	Physiology I
Calcutta University INDIA	M.S.	05/1973	Physiology/Biophysics
Calcutta University INDIA	Ph.D.	05/1975	Physiology/Endocrinology
Oxford University, UK	D.Phil.	01/1979	Physiology/Neuroendocrinology
Yale School of Medicine, USA	Postdoctoral	12/1979	Neuroendocrinology
Oxford University, UK	Postdoctoral	11/1980	Neuroendocrinology
Michigan State University, USA	Postdoctoral	04/1983	Neuroendocrinology

A. Personal Statement

I am a Board of Governors Distinguished Professor at the Rutgers University. I currently serve as Director of Endocrinology Program and I oversee approximately 3,000 ft2 of contiguous laboratory space dedicated to alcohol related research with all critical equipment, personnel, and adjacent core facilities to support the proposed studies. I have gained extensive experience leading large research projects as well as small pilot projects with co-investigators from multiple disciplines and across institutions. As demonstrated in the publications listed in part C, I have extensive experience in various aspects of neural regulation and molecular control of stress axis function, immune modulation and cancers, and developmental alcohol actions on these systems. In addition, I have considerable experience in gene expression analysis, gene editing technologies and DNA methylation studies. Postdoctoral trainees have made important contributions to our work, and my goals in working with these trainees is to enhance their skills in laboratory techniques and in critical thinking and data analysis, as the means to encourage their independent careers. I am currently serving as a director of a postdoctoral training grant (T32AA028254) in the area of alcohol research.

Current projects related to the enclosed research proposal:

T32AA028254
Sarkar DK (CO-PI), Aston-Jones G (CO-PI)
08/19-07/24
Molecular Neuroscience of Alcohol and Drug Abuse Research Training

R01AA028767
Sarkar DK (PI)
08/20-07/25
Role of exosomes in ethanol-induced neurotoxicity

R01 AA011591
Sarkar DK (PI)
07/18-6/23
Alcohol and Hyperprolactinemia

R21AA026697
Thomas J (PI), Sarkar DK (Co-investigator)
06/1/19 – 05/31/23
Sleep in children with fetal alcohol spectrum disorders

R01CA208632
Sarkar DK (PI)
06/17-05/23
Targeting opioidergic and adrenergic systems to control breast cancers

R01AA025359
Sarkar DK (PI)
8/17-06/23
Role of SRY in transgenerational transmission of alcohol epigenetic marks on proopiomelanocortin gene

B. Positions and Honors

Positions:

1983-1988	Assistant Professor of Reproductive Medicine in Residence, Dept. of Reproductive Medicine, University of California at San Diego, La Jolla, CA
1988-1996	Associate Professor (Tenured) of Veterinary Comparative Anatomy, Pharmacology, and Physiology, Washington State University, Pullman, WA
1996-1999	Professor of Veterinary Comparative Anatomy, Pharmacology, and Physiology, Washington State University, Pullman, WA
1998-1999	Director, Alcohol and Drug Abuse Unit, Washington State University, Pullman, WA
1999-2001	Professor and Chair, Dept. of Animal Sciences, Rutgers, The State University of New Jersey, New Brunswick, NJ
2001-present	Distinguished Professor, Department of Animal Sciences, Rutgers, The State University of New Jersey, New Brunswick, NJ
2001-present	Director, Rutgers Endocrinology Program, Rutgers, The State University of New Jersey
2001-2004	Director, Biomedical Division, Center of Alcohol Studies, Rutgers, The State University of New Jersey
2009-present	Member, The Cancer Institute of New Jersey & The Environmental and Occupational Health Sciences Institute
2011-2016	Chair, Endocrinology and Animal Biosciences Graduate Program Admission Committee,
2012-2014	CoChair, Ad Hoc Faculty Strategic Planning Committee for India
2014-present	Board of Governors Professor, Rutgers, The State University of New Jersey
2014-present	Member, Rutgers Committee on Academic Planning and Review
2017-present	Senior member, Brain Health Institute, Rutgers, The State University of New Jersey
2021	Member, Rutgers Responsibility Center Management Review Committee

Professional Service:

National and International Review Panels:

1992-1996	Member, NIH Neuroscience and Behavior Study Section
2001-2003	Member, NIH ALTX III Study Section
2003-ongoing	Ad hoc member of NIH study sections, NIAAA centers; Chair, ZRG NMB, ZRG1 IMM, ZDK1, GRB-4 M, NAL, ZDK1 GRB-4 M3; ZRG1 OBT-H, ZRG1 MDCN-E (50), ZRG1 OBT-J (55), NMB, NIAAA/NIDA T32 SEP, NAL, NSF review panels; NSERC, Canada review.
2006-2009	Member, Neurotoxicity and Alcohol (NAL) Study Section
2010-2014	Member, AA4 Study Section

Editorial Boards:

1987-1990	Member, Editorial Board, *Neuroendocrinology*
1989-1992	Member, Editorial Board, *Endocrinology*
2007-2011	Member, Editorial Board, *Open Endocrinology Journal*
2013-2019	Member, Editorial Board, *Journal of Hormones*

Field Editor:

2015-present	*Alcoholism: Clinical & Experimental Research*

Associate Editor:

2020-present	*Frontier in Cellular Neuroscience*
2021-presnt	*Advances in Drug and Alcohol Research* (ADAR)

Advisory Boards:

2009-2013	Member, NIAAA Editorial Advisory Board for *Alcohol Research & Health*
2011-present	External Advisory Board Member, NIAAA's NADIA Consortium
2015-present	External Advisory Board Member, Center for Alcohol Research in Epigenetics (CARE), Dept. of Psychiatry, University of Illinois at Chicago

Professional Societies Committees:

1986-1999	Member, Membership Committee, Endocrine Society
1997-1998	Member, Finance Committee, Research Society on Alcoholism
1998-1999	President, Society for Neuroscience, Northern Rocky Mountain Chapter
1999-2001	Member, Public Communication Committee, Research Society on Alcoholism
2020-present	Member, Education Committee, Research Society on Alcoholism
2020-present	Member, Award Committee, Research Society on Alcoholism
2020-present	Vice President, American Association of Indian Scientists for Cancer Research

Honors:

1971-1973	Indian Government National Merit Scholarship
1973	Gold Medal of Calcutta University, India
1975-1978	State Scholarship, West Bengal Government, India
1979	Best Thesis Award, Society for Endocrinology UK
1983-1985	Faculty Scholar Award, Mellon Foundation
1985-1987	Basil O'Connor Award, March of Dimes
1997	Fellow, American Association for the Advancement of Science
1997	Senior Scientist Award, Association of Scientist of Indian Origin in America
1997-2002	Research Scientist Developmental Award, National Institutes of Health
2004	Sustained Research Excellence Award, Cook College, Rutgers University
2006	Suva Mukherjee Memorial Oration Medal, Physiological Society of India
2009-2019	MERIT Award, National Institute on Alcohol Abuse and Alcoholism
2013	SK Manchanda Memorial FIPS Oration, Federation of Indian Physiological Societies
2014	Fellow, Indian Academy of Neurosciences
2014	Selected Faculty Honored by Rutgers During University Commencement Ceremony
2017	RSA Distinguished Researcher Award
2017	Tharp Award for Distinguished Research in Alcoholism
2020	Advancement of Science Award, The New Jersey Academy of Science (NJAS)
2022	Fellow, American College of Neuropsychopharmacology

C. Contributions to Science

Underlined author indicates NIH-mentored students, postdoctoral fellow, or faculty in Dr. Sarkar's laboratory.This research description is summarized from over 200 peer-reviewed articles and book chapters. A recent Web of Science citation report indicated that these articles received over 10801 citations with an h-index of 59.

1. Alcohol and Reproductive Neuroendocrinology: We described many of the initial manifestations and mechanisms of reproductive hormones, especially LHRH and prolactin, in the late 1970s and 1980s. We showed that LHRH is released in a cyclic fashion from the hypothalamus into the blood of pituitary portal vessels to maintain the reproductive cycle. Also, stress, lactation, and pituitary tumors that increase release of prolactin h inhibit LHRH secretion and induce hypogonadism. These works have been widely cited in research publications and textbooks. We were also the first to show that the formation of prolactinomas is associated with the loss of dopamine neuronal function. Dopamine agonists are now widely used for prolactinomas.

a) Sarkar DK, Chiappa SA, Fink G, Sherwood NM. (1976). Gonadotropin-releasing hormone surge in pro-oestrous rats. *Nature*. 264:461-3.
b) Sarkar DK, Gottschall PE, Meites J. (1982). Damage to hypothalamic dopaminergic neurons is associated with development of prolactin-secreting pituitary tumors. *Science*. 218:684-6.
c) Minami S, Frautschy SA, Plotsky PM, Sutton SW, Sarkar DK. Facilitatory role of neuropeptide Y on the onset of puberty: effect of immunoneutralization of neuropeptide Y on the release of luteinizing hormone and luteinizing-hormone-releasing hormone. Neuroendocrinology. 1990 Jul;52(1):112-5. doi: 10.1159/000125548. PMID: 2118604
d) Chun TY, Gregg D, Sarkar DK, Gorski J. (1998). Differential regulation by estrogens of growth and prolactin synthesis in pituitary cells suggests that only a small pool of estrogen receptors is required for growth. *Proc Natl Acad Sci USA*. 95:2325-30. PMCID: PMC19333.

2. Fetal Alcohol and Neuroimmune Control: We also showed the involvement of microglia, which are long-lived and self-replenishing CNS immune cells, in alcohol-induced killing of ß-endorphin neurons. My laboratory showed fetal alcohol causes activation of microglial cells that increases production of cytokines and chemokines as well as oxidative stress in neuronal cells that makes them more sensitive to oxidative damage. We also identified that one of the inflammatory cytokines, TNF-a, activates the nuclear factor-kB (NFkB) pathway and NADPH oxidase to induce neuronal apoptotic signaling. Microglial involvement in alcohol-induced neuronal demise has now been widely demonstrated in the CNS.

a) Boyadjieva NI, Sarkar DK. (2013). Microglia play a role in ethanol-induced oxidative stress and apoptosis in developing hypothalamic neurons. *Alcohol Clin Exp Res.* 37:252-62. PMCID: PMC3481017.
b) Shrivastava P, Cabrera MA, Chastain LG, Boyadjieva NI, Jabbar S, Franklin T, Sarkar DK. Mu-opioid receptor and delta-opioid receptor differentially regulate microglial inflammatory response to control proopiomelanocortin neuronal apoptosis in the hypothalamus: effects of neonatal alcohol J Neuroinflammation. 2017 Apr 14;14(1):83. doi: 10.1186/s12974-017-0844-3. PMID: 28407740
c) Chastain LG, Franklin T, Gangisetty O, Cabrera MA, Mukherjee S, Shrivastava P, Jabbar S, Sarkar DK. Early life alcohol exposure primes hypothalamic microglia to later-life hypersensitivity to immune stress: possible epigenetic mechanism. Neuropsychopharmacology. 2019 Aug;44(9):1579-1588. doi: 10.1038/s41386-019-0326-7. Epub 2019 Jan 30.
d) Mukherjee S, Cabrera MA, Boyadjieva NI, Berger G, Rousseau B, Sarkar DK. Alcohol increases exosome release from microglia to promote complement C1q induced cellular death of proopiomelanocortin neurons in the hypothalamus in a rat model of fetal alcohol spectrum disorders J Neurosci. 2020 Sep 4: JN-RM-0284-20. doi: 10.1523/JNEUROSCI.0284-20.2020.

3. Fetal Alcohol and Epigenetics: My group is also the first to identify the transgenerational epigenetic effect of fetal alcohol exposure on proopiomelanocortin, which controls stress and immune functions. Epigenetic mechanisms are newly identified molecular processes by which gene expression is controlled. We showed that this alcohol-induced epigenetic modification is transgenerational and passes via the male germline:

a) Govorko D, Bekdash RA, Zhang C, Sarkar DK. (2012). Male germline transmits fetal alcohol adverse effect on hypothalamic proopiomelanocortin gene across generations. *Biol Psychiatry*. 72:378-88. PMCID: PMC3414692. [Faculty of 1,000 citations], Nominated for Ziskind-Somerfeld Research Award.
b) Gangisetty O, Bekdash R, Maglakelidze G, Sarkar DK. (2014). Fetal alcohol exposure alters proopiomelanocortin gene expression and hypothalamic-pituitary-adrenal axis function via increasing MeCP2 expression in the hypothalamus. *PLoS One.* 9:e113228. PMCID: PMC4237387.
c) Jabbar S, Chastain LG, Gangisetty O, Cabrera MA, Sochacki K, Sarkar DK. (2016). Preconception alcohol increases offspring vulnerability to stress. *Neuropsychopharmacology*. 41:2782-2793 PMCID: PMC5026748.
d) Al-Yasari A, Jabbar S, Cabrera MA, Rousseau B, Sarkar DK. Preconception alcohol exposure increases

the susceptibility to diabetes in the offspring. Endocrinology. 2020 Oct 15:bqaa188. doi: 10.1210/endocr/bqaa188

4. Cancer: We also discovered that rodent offspring born from alcoholic mothers developed breast, prostate, and pituitary tumors. The cause for this increased cancer susceptibility may relate to their stress axis abnormality and the functional deficit of ß-endorphin neurons in the brain. We have developed a groundbreaking technique to prepare these neurons from stem cells. When transplanted into the brains of rats, these ß-endorphin cells reduce stress hyperresponsiveness and suppress tumor growth and metastasis.

a) Sarkar DK, Boyadjieva NI, Chen CP, Ortigüela M, Reuhl K, Kuhn P. (2008). Cyclic adenosine monophosphate differentiated beta-endorphin neurons promote immune function and prevent prostate cancer growth. *Proc Natl Acad Sci USA*. 105:9105-10. PMCID: PMC2449372. [Featured article].
b) Jabbar S, Reuhl K, Sarkar DK. Prenatal alcohol exposure increases the susceptibility to develop aggressive prolactinomas in the pituitary gland Sci Rep. 2018 May 16;8(1):7720. doi: 10.1038/s41598-018-25785-y. PMID: 29769550
c) Murugan S, Rousseau B, Sarkar DK. Beta 2 adrenergic receptor antagonist propranolol and opioidergic receptor antagonist naltrexone produce synergistic effects on breast cancer growth prevention by acting on cancer cells and immune environment in a preclinical model of breast cancer Cancers (Basel). 2021 Sep 28;13(19):4858. doi: 10.3390/cancers13194858.
d) Rousseau B, Murugan S, Palagani A, Sarkar DK. Beta 2 adrenergic receptor and mu opioid receptor interact to potentiate the aggressiveness of human breast cancer cell by activating the glycogen synthase kinase 3 signaling Breast Cancer Res. 2022 May 14;24(1):33. doi: 10.1186/s13058-022-01526-y.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/dipak.sarkar.1/bibliography/40472759/public/?sort=date&direction=as cending