BIOGRAPHICAL SKETCH

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NAME: Das, Siddhartha

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POSITION TITLE: Professor of Biology

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
University of Calcutta, India	B.S.	1974	Chemistry (Hons)
University of Calcutta, India	M.S.	1976	Biochemistry
University of Calcutta, India	Ph. D	1982	Biochemistry
University of Pittsburgh, PA	Postdoc	1983-86	Parasite Enzymology
University of California, San Diego	Res. Biochem	1987-93	Molecular Parasitology

A. Personal Statement

Currently, I am serving as a director of the Infectious Disease and Immunology Cluster (IDIC) of the Border Biomedical Research Center (BBRC) at the University of Texas at El Paso (UTEP). I am an established investigator and maintain a strong research program. My laboratory in Biological Sciences Department at UTEP investigates the cellular and molecular biology of phospho- and sphingolipids in parasitic protozoa, *Giardia lamblia and Entamoeba invadens.* I have a second project that investigates the lipid rafts-based cell signaling in breast cancer cells. I have published over 50 papers in peer-reviewed journals. I am on the editorial board and a permanent reviewer for various journals devoted to basic biology, biochemistry, microbiology, molecular biology, and parasitology, and served as a reviewer of NIH grants (NIAID and NIGM). I collaborate with national and international researchers and served as chair/member of several search committees and tenure/promotion committee at UTEP. In addition, I work with each new faculty member and guide them through the entire tenure process. I also direct various inter and intra-cluster/departmental research collaborations. I teach biochemistry, cell biology, molecular biology and molecular parasitology at the undergraduate and graduate levels. Over the years, I have mentored many undergraduate and graduates students as well as post-doctoral fellows in my research laboratory. Below please see the publications with students, new faculty members and collaborators.

a. Staake, M, Chauhan, J., Zhou, D., Shanker, A*, De Chatterjee, A., Das S and Patterson, S.E** (2010). Phosphonoxins III: Synthesis of α-Aminophosphonate Analogs of Antifungal Polyoxins with Anti-*Giardia* Activity. *Org. Lett.* 12, 4596-4599 (PMCID:PMC2962623).

b. Gamboa Varela, J., De Chatterjee, A*, Guevara, P*, Ramirez, V., Metta, A., Das, S and Nuñez, J.E.** (2014). Synthesis and characterization of diphenyl pyridineamine platinum(II) complexes as dual-function agents against human breast cancer cells. *J Biol Inorg Chem*. 19, 967-79.

(*Students; ** Collaborators)

B. Positions and Honors

Positions and Employments:

Doctoral student, Department of Biochemistry, University of Calcutta (1977-1983)
Postdoctoral Fellow, University of Pittsburgh, Pittsburgh (1983-1986)
Postgraduate Researcher, University of California Medical Center, San Diego, CA (1986-1989)
Assistant Res. Biochemist, University of California Medical Center, San Diego, CA. (1989 – 1993)
Assistant Professor, University of Texas at El Paso (1993 – 2000)
Associate Professor, University of Texas at El Paso (2000 – 2008)
Professor, University of Texas at El Paso (2008-present)
Director, Infectious Diseases and Immunology Cluster
The Border Biomedical Research Center (BBRC), University of Texas at El Paso (2004-Present)
(Supported by NIH/NCRR/RCMI)

Other Experience and Professional Membership

Editorial Board: The *World Journal of Biological Chemistry (2010-2013); The World Journal of Emerging Infectious Diseases (2011-2015), ISRN Parasitology (2012-); Molecular and Biochemical Parasitology (2013-); Trends in Parasite and Vector (2014-); Gastroenterology and Hepatology (1914-); Journal of Microbiology and Infection (2014-).*

Reviewers*: American Journal of Tropical Medicine and Hygiene, Archives of Biochemistry and Biophysics, British Journal of Pharmacology, Cancer Letter, Chemotherapy, Cellular Microbiology, Experimental Parasitology, Infection and Immunity, IUBMB Life, International Journal for Parasitology, Journal of Health, Population and Nutrition, Journal of Parasitology, Molecular and Biochemical Parasitology, Molecular and Cellular Biochemistry, Journal of Eukaryotic Microbiology, PLOS One, Eukaryotic Cell, Molecular Microbiology, Parasitology, Traffic, Oswaldo Cruz, FASEB J., Journal of Anti-Microbial Chemotherapy, World Journal of Biological Chemistry, Inflammation Research, African Journal of Biotechnology, Trends in Parasitology, Journal of Cell Science, Cellular Biochemistry, Cell Biochemistry and Biophysics, Journal of Biological Chemistry, ISRN Parasitology and Parasite and Vector.*
Society Membership: American Society for Biochemistry and Molecular Biology, American Society for Tropical Medicine and Hygiene, International Society for Protistologists; American Society of Microbiology (ASM), American Society of Cell Biology (ASCB).

Grant Reviewer: NIH, NIAID (Pathogenic Eukaryote Study Section): February 2012, December 2013, October, 2014; NIH, NIAID (Microbiology including AIDS), November, 2014; NIH, General Medicine, April 2012; NSERC Discovery Grant (Canada): 2011, 2012, 2013

Awards and Honors (2008-): Outstanding Research Award, College of Science, UTEP (2008); UTEP-ORSP Excellent Award (2012); Best Dissertation Mentor Award, College of Science, UTEP (2013).

C. Contribution to Science

1. I started working on enteric parasites when I was a post-doctoral researcher at the University of California at San Diego (UCSD). My early research in this area includes the understanding of encystation process in *Giardia* and *Entamoeba*. I was the part of a group that first successfully developed the method for in vitro encystation (or cyst formation) of *Giardia lamblia*. *Giardia* is a parasitic protozoan that is responsible for the waterborne diarrhea (giardiais) throughout the world. Because of my strong biochemistry background, I became interested in understanding the biochemical and metabolic reactions that are up-regulated during encystation in both *Giardia* and *Entamoeba*. During the same period, I discovered a novel invariant surface antigen of *Giardia* that is anchored on the plasma membrane via glycosylphospahtidylinositol (GPI). This the only invariant antigen that is expressed by Giardia in its all form of life cycle.

    a. Gillin, F. D., Reiner, D. S., Gault, M. J., Douglas, H., **Das, S**., Wunderlich, A., and Sauch, J. (1987). Encystation and Expression of Cyst Antigens by *Giardia lamblia* in vitro. *Science* 235, 1040.
    b. **Das, S.,** Traynor-Kaplan, A., Reiner, D. S., Meng, T. C., and Gillin, F. D. (1991). A Surface Antigen of *Giardia lamblia* with a Glycosylphosphatidylinositol Anchor. *J. Biol. Chem*. 266, 21318.
    c. **Das, S** and Gillin, F.D. (1991). Chitin Synthase in Encysting *Entamoeba invadens. Biochem. J.* 280, 641, 1991.
    d. **Das, S**., and Gillin, F.D. (1996). *Giardia lamblia*: Increased UDP-N-acetyl-D-glucosamine and UDP-N-acetyl-D-galactosamine transferase activities during encystation. *Exp. Parasitol***.** 83, 19-29.

2. Because *Giardia* colonizes and thrives in a lipid and bile-enriched environment in the small intestine but lacks the capacity to synthesize its own lipids de novo, I took an initiative to understand how lipids are taken up by this parasite, traffic, remodeled and utilized to synthesize membranes and vesicles. Our results suggest that *Giardia* imports lipid molecules by clathrin-dependent and independent pathways and some lipids are internalized by bilayer flip-flop. In fact, we are the first group of investigators who used fluorescent lipids to address various aspects of cellular and molecular biology of lipids in *Giardia*. Using mass spectrometry, we also conducted lipidomic analyses to reveal a complete lipid synthesis and metabolic pathways in this parasite.

    a. Stevens, T., Gibson, G., Allison, M., Adam, R., and **Das, S**. (1997). Uptake and cellular localizationof exogenous lipids by *Giardia lamblia*, a primitive eukaryote. *Exp. Parsitol.* 86, 133-143.
    b. Gibson, G. M., Ramirez, D and **Das, S**. (1999). *Giardia lamblia*: Incorporation of free and conjugated fatty acids into glycerol-based phospholipids. *Exp. Parasitol*. 92, 1-12 (image displayed on the cover page of the journal).
    c. **Das, S.,** Schteingart, C., Hoffman, A. F., Reiner, D. S., Aley, S., and Gillin, F. D. (1997). *Giardia lamblia*: Carrier mediated bile acid uptake and release. *Exp. Parasitol*. 87, 133-141.
    d. Subramanian A. B., Navarro, S., Carrasco, R., Marti, M., and **Das, S**. (2000). Role of Exogenous inositol and phosphatidylinositol in glycosylphosphatidylinositol anchor synthesis of GP49 by *Giardia lamblia*. *Biochim. Biopys. Acta* 1483, 69-80.
    e. Hernandez, Y., Zamora , G., Ray, S., Chapoy, J., Chavez, E., Valvarde, R., Williams, E., Aley, S.B. and **Das, S**. (2007) Transcriptional analysis of three major putative phosphatidylinositol Kinase genes in a parasitic protozoan, *Giardia lamblia. J. Euk. Microbiol*. 54, 29-32.
    f. Yichoy, M., Nakayasu, E.S., Shpak, M., Aguilar, C., Aley, S. B., Almeida, I.C., and **Das, S**. (2009). Lipidomic analysis reveals that phosphatidylglycerol and phosphatidylethanolamine are newly generated phospholipids in an early-divergent protozoan, *Giardia lamblia. Mol. Biochem. Parasitol.* 165, 67-78. [PMCID. PMC: 2737524]

3. Our current research focuses on understanding the role of sphingolipids in regulating encystation and cyst production by *Giardia*. Studies revealed the presence of three putative sphingolipid synthesis and two metabolic genes that are differentially regulated during encystation. In delineating their roles in encystation, we found that ceramide and glucosylceramide plays an important role in the biogenesis of encystation-specific vesicles and cyst wall biogenesis. We are also interested in investigating how the

interplay among various classes of sphingolipids (i.e., ceramide, glucosylceramide and sphingomyelin) is critical for encystation and cyst production. We use mass spectrometry, cellular and molecular methodologies to elucidate the mechanism by which sphingolipids regulate the process of encystation. Our future goal is to identify suitable sphingolipid targets that could be utilized to develop anti-giardial therapy.

a. Hernandez, Y., Castillo, C., Roychowdhury, S., Hehl, A., and **Das, S.** (2007). Clathrin-dependent pathways and the cytoskeleton-network are involved in ceramide endocytosis by a parasitic protozoan, *Giardia lamblia. Int. J. Parasitology*. 37, 21 (Image featured on the cover page of the journal) [PMCID: PMC1831817]
b. Hernandez, Y., Shpak, M., Duarte, T.T., Mendez, T.L., Maldonado, R.A., Roychowdhury, S., Rodriguez, M.L., and **Das, S** (2008). Novel role of sphingolipid synthesis genes in regulating giardial encystation. *Infect*. *Immun*. 76, 2939-2949 [PMCID: PMC 2446683]
c. Mendez, T.L., De Chatterjee, A., Duarte, T.T., Gazos-Lopes, F., Robles-Martinez, L., Roy, D., Sun, J., Maldonado, R.A., Roychowdhury, S., Almeida, I.C. and **Das, S**. (2013). Glucosylceramide Transferase Activity Is Critical for Encystation and Viable Cyst Production by an Intestinal Protozoan, *Giardia lamblia. J. Biol. Chem.* 288, 16747-16760. [PMCID: PMC 3675608] **[F1000 Prime Recommended]**

4. The following three review articles and two book chapters demonstrates the impact of our research in *Giardia*.

a. **Das, S**., Stevens, T., Castillo, C*., Villasenor, A., Arredondo, H., and Reddy, K. (2002). Lipid metabolism in mucus-dwelling amitochondriate protozoa. *Int J Parasitol.* 32, 655-675
b. **Das, S.,** Castillo, C., and Stevens, T. (2001) Phospholipid remodeling/generation by *Giardia*: the role of the Lands Cycle. *Trends in Parasitol*. 17, 317-321 (Featured on the **cover page**).
c. Yichoy, M., Duarte, T.T., De Chatterjee, A., Mendez, T.L., Aguilera, K.Y., Roy, D, Roychowdhury, S., Aley, S.B. and **Das, S**. (2011) Lipid metabolism in *Giardia*: a post-genomic perspective. *Parasitology* 138, 267-278.[PMCID: PMC3132189]
d. Castillo, C., Hernandez, Y.,Roychowdhury, S., and **Das, S**. (2009) Cytoskeleton-Based Lipid Transport in a Parasitic Protozoan, *Giardia lamblia* in *Giardia and Cryptosporidium:* from Molecules to Disease (Ortega-Pierres et al. Eds). CAB International. Oxfordshire, UK. pp 292-308.
e. Yichoy, M., Nakaysu, E., De Chatterjee, A., Aley, S.B., Almeida, I.C., **Das, S.** (2011) Mass spectrometric analyses of phospholipids and fatty acids in *Giardia lamblia* in "*Giardia:* A Model organism" (Lujan, H and Staffan, S. Eds). Springer, New York, pp 111-125.

Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/myncbi/collections/mybibliography/

D. Research support

Current Support:

1R01AI095667-01 (NIAID, NIH)

"Sphingolipid and Mechanism of Cyst Formation by *Giardia"* 07/01/2011-06/30/2016
Role: PI.
The major focus of this project is to delineate the mechanisms by which giardial glucosylceramide transferase-1 (gGlcT1) regulate the cyst production by *Giardia*.

RCMI (NIMHD, NIH)
Border Biomedical Research Center 07/01/2014-06/30/2019

Role: Director of Infectious Diseases and Immunology Cluster
(PI: Dr. Robert Kirken)

The goal is to coordinate research on border related infectious diseases at UTEP.

Completed Research Support

RCMI (NIMHD, NIH)
Border Biomedical Research Center 07/01/2009-06/30/2014

Role: Director of Infectious Diseases and Immunology Unit
(PI: Dr. Diana Natalico)
The goal is to coordinate research on border related infectious diseases at UTEP.

S06GM081200812 (NIGMS, NIH)

Sphingolipids as potential targets for anti-giardial therapy 06/01/2007-05/31/2011
Role: PI

The goal of this project is elucidate sphingolipid metabolism in Giardia and sphingolipids can be targeted for developing anti-giardial therapy.