BIOGRAPHICAL SKETCH

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NAME: Niraj Nepal

POSITION TITLE: Postdoctoral Researcher

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*)*	START DATE MM/YYYY	END DATE MM/YYYY	FIELD OF STUDY
Kathmandu University, Nepal	B-tech	08/2003	08/2007	Biotechnology
West Virginia State University, WV, USA	M.Sc.	08/2009	09/2012	Biotechnology
Marshall University, WV, USA	PHD	08/2013	06/2019	Biomedical sciences
Marshall University, WV, USA	Postdoctoral	06/2019	present	Clinical and Translational Science

A. Personal Statement

My long-term research interests involve the development of a comprehensive understanding of key developmental pathways and how alterations in gene expression contribute to human disease. My academic training and research experience have provided me with an excellent background in multiple biological disciplines specifically in biomedical sciences including molecular biology, biochemistry, and genetics. As a graduate student (M.Sc. in biotechnology), I was able to conduct research with Dr. Robert Harris in Smooth muscle cells (A7R5). These cells start to form three-dimensional structure (tube like or blood vessel like structure) when kept in growth factors for certain period of time because of the communication between cells, environment and nutrients that they share. I used immunofluorescence and immunohistochemistry techniques in order to individually assess protein markers (VE-cadherin, fibronectin, alpha-SM-actin (SMC), SM myosin (SMC), type I collagen, PECAM-1, von Willebrand factor and calponin (SM)) in individual cells in the structures and, in the cases of ECM and cell surface proteins, at different surfaces on the cells. As a predoctoral student with Dr. Eric Blough, my research focused on mimicking the condition of sepsis in animal model and evaluated potential drugs (Cerium Oxide nanoparticles, Curcumin nanoparticles) for sepsis treatment. During my undergraduate and graduate careers, I received several academic and teaching awards. For my postdoctoral training, I will continue to build on my previous training in regulation of intestinal transporters that will allow me to address additional questions regarding the mechanism of nutrition and electrolyte absorption during various disease conditions. My sponsor Dr. Uma. Sundaram is an internationally recognized leader in the intestinal transporters field and has an extensive record for training postdoctoral fellows. The proposed research will provide me with new conceptual and technical training on the transcriptional regulation of

intestinal transporters. In addition, the proposed training plan outlines a set of career development activities and workshops – e.g. grant writing, public speaking, lab management, and mentoring students – designed to enhance my ability to be an independent investigator.

B. Positions and Honors

Positions and Employment

2019 - Postdoctoral Researcher, Marshall University

Other Experience

Jan,2007 – May,2007	Teaching assistant responsible for Molecular and Cellular Biology
May,2007-Dec 2007	Quality control summer internship, Gorkha Brewery Ltd
Jan 2008- Aug 2009 -	Laboratory assistant, Universal College of Medical Science

Honors

2003-2007	Merit Scholar, Kathmandu University
Spring 2004- Fall2007	Dean's Honor, Kathmandu University
Jan 2010-Aug-2010	Research Assistant, Guss R Douglass (Land Grant Institute)
2010- 2012	Research Assistant from NSF grant

C. Contribution to Science

1. **Early Career:** My early career contributions were focused on applying my knowledge of biotechnology and biomedical sciences in developing sepsis model in rats and their treatment with various nanoparticles.

Liu, H., Blough, E. R., Arvapalli, R., Wang, Y., Reiser, P. J., Paturi, S., **Nepal, N .**, Wu, M. (2012). Regulation of contractile proteins and protein translational signaling in disused muscle. *Cell Physiol Biochem, 30*(5), 1202-1214. doi:10.1159/000343310

Manne, N. D., Arvapalli, R., **Nepal, N.,** Shokuhfar, T., Rice, K. M., Asano, S., & Blough, E. R. (2015). Cerium oxide nanoparticles attenuate acute kidney injury induced by intra-abdominal infection in Sprague-Dawley rats. *J Nanobiotechnology, 13*, 75. doi:10.1186/s12951-015-0135-z

Manne, N. D., Arvapalli, R., **Nepal, N**., Thulluri, S., Selvaraj, V., Shokuhfar, T., Blough, E. R. (2015). Therapeutic Potential of Cerium Oxide Nanoparticles for the Treatment of Peritonitis Induced by Polymicrobial Insult in Sprague-Dawley Rats. *Crit Care Med, 43*(11), e477-489. doi:10.1097/CCM.0000000000001258

Selvaraj, V., **Nepal, N.,** Rogers, S., Manne, N. D., Arvapalli, R., Rice, K. M., . . . Blough, E. R. (2015a). Cerium oxide nanoparticles inhibit lipopolysaccharide induced MAP kinase/NF-kB mediated severe sepsis. *Data Brief, 4*, 105-115. doi:10.1016/j.dib.2015.04.023

Selvaraj, V., **Nepal, N**., Rogers, S., Manne, N. D., Arvapalli, R., Rice, K. M., . . . Blough, E. R. (2015b). Lipopolysaccharide induced MAP kinase activation in RAW 264.7 cells attenuated by cerium oxide nanoparticles. *Data Brief, 4*, 96-99. doi:10.1016/j.dib.2015.04.022

Selvaraj, V., **Nepal, N.**, Rogers, S., Manne, N. D., Arvapalli, R., Rice, K. M., . . . Blough, E. R. (2015). Inhibition of MAP kinase/NF-kB mediated signaling and attenuation of lipopolysaccharide induced severe sepsis by cerium oxide nanoparticles. *Biomaterials, 59*, 160-171. doi:10.1016/j.biomaterials.2015.04.025

2. **Graduate Career (PhD):** My graduate research contributions focused on the regulation of Na/K-ATPase in the intestinal epithelial cells. Na/K-ATPase provides the favorable transcellular Na gradient required for the function of brush border membrane Na-dependent nutrient co-transporters, which mediate the assimilation of nutrients such as glucose and amino acids. Results from my research were highly relevant as they revealed the novel mechanisms involved in the regulation of Na/K-ATPase during the maturation of crypts to villus cells.

Sundaram S, Palaniappan B, **Nepal N**, Chaffins S, Sundaram U, Arthur S. Mechanism of Dyslipidemia in Obesity-Unique Regulation of Ileal Villus Cell Brush Border Membrane Sodium-Bile Acid Cotransport. Cells. 2019 Oct 3;8(10). doi: 10.3390/cells8101197. PubMed PMID: 31623375; PubMed Central PMCID: PMC6830326.

Nepal, N., Arthur, S., & Sundaram, U. (2019). Unique Regulation of Na-K-ATPase during Growth and Maturation of Intestinal Epithelial Cells. *Cells, 8*(6). doi:10.3390/cells8060593

Palaniappan, B., Arthur, S., Sundaram, V. L., Butts, M., Sundaram, S., Mani, K., **Nepal, N.,** Sundaram, U. (2019). Inhibition of intestinal villus cell Na/K-ATPase mediates altered glucose and NaCl absorption in obesity-associated diabetes and hypertension. *FASEB J*, fj201802673R. doi:10.1096/fj.201802673R

Postdoctoral Career: I have been working as a postdoctoral researcher for the past 6 months under the supervision of Dr. Uma Sundaram. Currently, I am involved in the proposed project with specific focus on inflammation and basic physiological aspects of Na-dependent nutrient and electrolyte transporters in *in vivo* rodent model, *in vitro* IEC-18 cells and systems. My training has given me the required expertise to handle the *in vivo* systems and the *in vitro* systems of intestinal epithelial cells and Human organoid. In these systems, I will conduct studies to determine the transcriptional regulation of SGLT1 and NHE3 by constitutive nitric oxide using the proposed techniques. With my background and experience, I can definitely play an important and productive role in the proposed project.

Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/collections/mybibliography/

D. Additional Information: Research Support and/or Scholastic Performance

Scholastic Performance

YEAR	COURSE TITLE	GRADE
	MARSHALL UNIVERSITY, WV	
2001	Seminar in Toxicology	P
2002	Biostatistics including R-Programming	A
2003	Ethics in Biological Research	A

YEAR	COURSE TITLE	GRADE
2004	Seminar in Biomedical research	P

Except for the scientific ethics course, UC San Diego graduate courses are graded P (pass) or F (fail). Passing is C plus or better. The scientific ethics course is graded CRE (credit). Students must attend at least 6 of the eight presentation/discussion sessions for credit.