INDRANI TALUKDAR, Ph.D.

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Current Position:

Assistant Professor, BITS-PILANI, K. K. Birla Goa Campus, Biological Sciences. (February, 2013-present)

Education

Postdoctoral fellow, Sanford-Burnham Institute for Medical Research, San Diego, (July, 2009 – December, 2011)

Postdoctoral fellow, Department of Medicine, University of California, San Diego (June, 2006 – July, 2009)

Ph.D., Biochemistry and Molecular Biology, Department of Biochemistry and Molecular Pharmacology, School of Medicine, West Virginia University (May 2006)

Master of Sciences (Biochemistry) University of Calcutta, India (June 1999).

Bachelor of Sciences (Chemistry) University of Calcutta, India (June 1997).

Research Experience

Current research work:

Alternative splicing is a major source of diversity in human proteome, which can modulate protein function, affinities for assembly of heteromeric complexes & also alter mRNA stability.

Evidence on the roles of splicing and alternative splicing in various diseased conditions is emerging. However, the role of alternative splicing linking signaling pathways to gene regulation and onset of diseases is not well understood. It is important to know the genes involved in epidemic diseases and their mode of regulation. Knowledge at the molecular level would thus provide the future foundation of research and drug discovery.

The objective of the current study is to identify genes which undergo changes in alternate splicing upon receiving different stimuli that contribute towards diseased conditions like obesity, insulin resistance and type II diabetes and study their molecular mechanism(s) of actions. This study will help to link between signal transduction, gene regulation by alternative splicing and diseased conditions and thus, will be important for clinical research and drug discovery for various diseases.

The goals of the study are:

1) To identify target genes regulated by alternative splicing due to modulation of signaling pathways involved in type II diabetes, obesity and insulin resistance.

2) To reveal the involvement and mechanism(s) of individual genes at the molecular level which undergo alternate splicing due to various stimuli.

3) To contribute in better understanding of the above mentioned diseases at the molecular level.

4) To contribute towards making a global map by linking signal transduction to gene regulation to diseased conditions.

Postdoctoral research:

Identification of protein kinases involved in barrier pathways in somatic cell reprogramming; a kinomewide RNAi screen.

Molecular mechanisms of small molecule(s) targeting the retroviral replicator protein Vif.

Identification of molecular mechanisms involved in siRNA and miRNA pathways.

Identification of regulatory factors involved in insulin receptor splicing to identify novel therapeutic approaches to prevent and cure diabetes.

Dissertation Research Title:

"Mechanism of regulation of glucose-6-phosphate dehydrogenase (G6PD) by nutrients and hormones in primary rat hepatocytes" (Name of the mentor: Dr. Lisa M. salati)

Teaching Experience

- Currently teaching courses on 'recombinant DNA technology', 'advanced cell and molecular biology', 'general biology' and laboratory techniques to undergraduates, MSc and M.E. students at BITS-Pilani, Goa campus.

-Taught a special paper course to post graduate second year students on stem cell and cancer stem cell biogenesis and their regulation by micro RNA at University of Calcutta, department of Biochemistry (2012).

- Small Groups Facilitator for first year medical students at WVU, school of medicine, (2003, 2004). Course taught: Medical Biochemistry.

Informal teaching experience

-Private tutor for first year medical and dental students, recruited by WVU, Department of Biochemistry (2005-2006).

-Taught private lessons in biochemistry to first year medical, dental, graduate and undergraduate students (2001 - 2006).

Lab courses

-Lab instructor and coordinator for undergraduates at WVU (2001).

-Taught laboratory techniques to graduate and undergraduate students in the lab (2001 – 2011)

Oral Communication

Invited speaker, at the Center for Stem Cell Research, Vellore, June, 2012

At International meetings/conferences

Poster Presentations at:

ASBMB, Experimental Biology San Diego, April 2008. Cold Spring Harbor Laboratory RNA meeting, September 2007. Gordon Research Conference, 'Signal Transduction in the nucleus', Santa Ynez Valley Marriott, California, February 2005. RNA Meeting, Wisconsin 2004. Rustbelt RNA meeting, Columbus, Ohio 2004. FASEB Summer Conference Snowmass, Colorado 2003.

At West Virginia University

Poster presenter and speaker, E.J. Van Liere Memorial Convocation, (2005)

Speaker, Departmental literature-based research seminars (2001 and 2002) **Presenter**, Department Graduate Student journal clubs (2000 - 2005) **Presenter**, Department Research Forum (2000-2005)

Honors and Awards

-A project titled as "Alternative splicing in signal transduction and diseases; a genome wide approach" has been recommended for funding by the 'Department of Science and Technology', Govt. of India, under young scientist's scheme, 2013.

-A 'research initiation grant' awarded by BITS-Pilani, Goa campus, 2013.

-Poster Award from RNA Society, ASBMB meeting on Experimental Biology, San Diego 2008.

-Obtained **3rd position** in E.J. Van Liere Memorial Convocation, for oral presentation, Health Sciences Center, WVU (2005)

-Student Travel Award, WVU, School of Medicine, (2005)

-Invited Speaker (Young scientist) FASEB Summer Conference Snowmass, Colorado (2003)

-Graduate student academic achievement award **"In Recognition of Outstanding** Academic Achievement" from WVU School of Medicine (2002)

-Qualified in Graduate Aptitude Test in Engineering (GATE) examination, in Biochemistry and Biotechnology, conducted by Indian Institute of Technology, Percentile Score of **94.22** (1999)

Publications and Manuscript

1) Arachidonic Acid Inhibits the Insulin Induction of Glucose-6-phosphate Dehydrogenase via p38 MAP Kinase. **Indrani Talukdar**, Wioletta Szeszel-Fedorowicz, and Lisa M. Salati., J Biol Chem. 2005 Dec 9;280(49):40660-7. Epub 2005 Oct 6., PMID: 16210322

2) An Exonic Splicing Silencer is Involved in the Regulated Splicing of Glucose 6- phosphate Dehydrogenase mRNA. Wioletta Szeszel-Fedorowicz, **Indrani Talukdar**, Brain N. Griffith, Callee M. Walsh, and Lisa M. Salati., J Biol Chem. 2006 Nov 10;281(45):34146-58. Epub 2006 Sep 15., PMID: 16980303

3) Pulse Sensitivity of the LH{beta} Promoter is Determined by a Negative Feedback

Loop Involving Egr1 and Nab1/2. Mark A. Lawson, Rie Tsutsumi, Hao Zhang, Indrani Talukdar, Brian K. Butler, Sharon J. Santos, Pamela L. Mellon, and Nicholas J.G. Webster., Mol Endocrinol. 2007 Feb 13; [Epub ahead of print] PMID: 17299135

4) SRp20, CUG-BP1 and hnRNP A1 binding to IR exon 11 modulate its alternative splicing, Supriya Sen*, Indrani Talukdar* and Nicholas JG Webster, Mol Cell Biol. 2009 Feb;29(3):871-80. Epub 2008 Dec 1.

* Both authors contributed equally to the work.

5) A role for AMPK in the inhibition of glucose-6-phosphate dehydrogenase by polyunsaturated fatty acids, Kohan AB*, **Talukdar I***, Walsh CM and Salati LM. Biochem Biophys Res Commun. 2009 Oct 9;388(1):117-21. Epub 2009 Jul 30

* Both authors contributed equally to the work.

6) Muscleblind-like 1 (Mbnl1) promotes insulin receptor exon 11 inclusion via binding to a downstream evolutionarily conserved intronic enhancer. Sen S, **Talukdar I**, Liu Y, Tam J, Reddy S, Webster NJ. J Biol Chem. 2010 Aug 13;285(33):25426-37. Epub 2010 Jun 2.

7) hnRNP A1 and hnRNP F modulate the alternative splicing of exon 11 of the insulin receptor gene. **Talukdar I***, Sen S*, Urbano R, Thompson J, Yates JR 3rd, Webster NJ, PLoS One. 2011;6(11):e27869. Epub 2011 Nov 23

* Both authors contributed equally to the work.

8) A kinome-wide RNAi screen reveals barrier pathways in somatic cell reprogramming.Kumi Sakurai*, **Indrani Talukdar***, Zhonghan Li, Chih-Chung Lu, and Tariq M. Rana. (*Manuscript in revision in Cell Stem Cell*). * Both authors contributed equally to the work

Manuscript in preparation

1)Differential binding affinity of Ago2 for struturaly different siRNAs. Chia-Ying Chu, Indrani Talukdar, Han-Chen Chiu and Tariq M. Rana.

2) Molecular mechanism of a small molecule targeting the HIV regulatory protein Vif Gatikrushna Singh*, Idrees Mohammed*, Indrani Talukdar*, Tariq M. Rana.
* all authors contributed equally to the work