

Curriculum Vitae

Sushant Bhatnagar, Ph.D.

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Education

- 2008 Ph.D., Biochemistry and Molecular Biology, West Virginia University, Morgantown, WV
Concentration: Biochemistry and Molecular Biology
Thesis Title: Fibroblast growth factor-19 inhibits hepatic fatty acid synthesis
Thesis Advisor: Dr. Frank B. Hillgartner
- 2001 M.Sc. (Hons), Chemistry, Panjab University, Chandigarh, India
Concentration: Physical Chemistry
Project Title: Study of Ground Water Quality in the Nawashahar Region of Punjab
- 1999 B.Sc. (Hons), Chemistry, Panjab University, Chandigarh, India

Academic Appointments

- 08/2015– Present Assistant Professor, Department of Endocrinology, University of Alabama, Birmingham, AL
- 06/2012– 08/2015 Assistant Scientist, Department of Biochemistry, University of Wisconsin, Madison, WI
Research Mentor: Dr. Alan D. Attie
- 01/2009– 06/2012 Research Associate Post Doctoral Fellow, Department of Biochemistry, University of Wisconsin, Madison, WI
Research Mentor: Dr. Alan D. Attie

Research Experience

- 2009– Present *Project 1:* Identifying the molecular mechanisms regulating insulin secretion in pancreatic β -cells using cell lines and mouse models; implications in type 2 diabetes
- Positional cloning of tomosyn-2 as gene that increases susceptibility to type 2 diabetes

- Role of tomosyn-2 as a novel regulator of insulin secretion
- Identification and characterization of tomosyn-2 E3-ubiquitin ligase and its role in insulin secretion
- Identification and characterization of cell signaling pathways that regulate the activity of tomosyn-2 in insulin secretion
- Identification and characterization of synaptotagmin that interacts with tomosyn-2 to regulate insulin secretion
- Identification of novel binding partners of tomosyn-2 that play an important role in insulin secretion

Project 2: Develop a high through-put screen to identify novel proteins regulating metabolic processes

2002–2008

Project: Mechanism by which fibroblast growth factor-19 inhibits fatty acid synthesis

- Determined the effects of FGF-19 on genes involved in fatty acid synthesis, cholesterol synthesis, fatty acid oxidation, and gluconeogenesis in the presence of different hormones: insulin, glucose, agonists of liver X receptors, triiodothyronine, and cAMP, respectively
- Determined the mechanism by which FGF-19 inhibits insulin-induced effects on genes involved in fatty acid synthesis
- Determined the mechanism by which FGF-19 inhibits the activity of a lipogenic gene transcription factor, sterol regulatory element binding protein-1c (SREBP-1c)

Publications

1. Talukdar S, **Bhatnagar S**, Dridi S, Hillgartner FB. (2007). Chenodeoxycholic acid suppresses the activation of acetyl-CoA carboxylase- α gene transcription by the liver X receptor agonist T0-901317. *Journal of Lipid Research*, 48 (12): 2647-63
2. **Bhatnagar S**, Damron, HA, Hillgartner FB. (2009). Fibroblast Growth Factor-19, A Novel Factor That Inhibits Hepatic Fatty Acid Synthesis. *Journal of Biological Chemistry*, 284 (15): 10023-33
3. **Bhatnagar S**, Oler AT, Worzella LS, Rabaglia, MR, Stapleton DS, Keller M, Schueler KL, Attie AD. (2011). Tomosyn-2, a novel gene in a fasting glucose locus that regulates insulin secretion. *PLoS Genetics*, 7(10): e1002323
4. Soni MS, Rabaglia ME, **Bhatnagar S**, Shang J, Ilkayeva O, Mynatt R, Zhou YP, Schadt EE, Thornberry NA, Muoio DM, Keller MP, and Attie AD (2014). Down regulation of Carnitine acyl-carnitine translocase by miRNAs 132 and 212 amplifies glucose-stimulated insulin secretion. *Diabetes*. 2014 Nov; 63(11): 3805-14
5. **Bhatnagar S**, Soni MS, Wrighton LS, Hebert AS, Zhou AS, Paul PK, Gregg T, Rabaglia ME, Keller MP, Coon JJ, and Attie AD (2014). Phosphorylation and degradation of tomosyn-2 de-represses insulin secretion. *Journal of Biological Chemistry*. 2014 Sep 5; 289 (36): 25276-86
6. **Bhatnagar S** and Attie AD. Molecular mechanisms underlying synaptic inhibition of exocytosis. *(In Preparation) (Invited) Critical Reviews in Biochemistry and Molecular*

Biology.

7. Wrighton LS, **Bhatnagar S**, Roper LK, Kebede MA, Oler AT, Keller MP, Chapman ER, and Attie AD. Non-calcium binding synaptotagmin-11 is involved in the stability of insulin dense core vesicles. (**Submitted to JBC**)
8. **Bhatnagar S**, Koltes J, Morota G, Dawson J, Broman A, Yandell B, Attie AD. A method to screen high-throughput bio-molecule datasets for candidate inter-tissue communication molecules: applications in metabolic disease. (**In Preparation**)

Published Abstracts

1. **Bhatnagar S**, Schneider LR, Hebert A, Coon JJ, Attie AD. (2013). Insulin, cAMP, and phorbol ester-activated cell signaling pathways phosphorylate tomosyn-2 to regulate insulin secretion in pancreatic beta-cells. *Diabetes*, 62 (Suppl. 1); A581
2. **Bhatnagar S**, Herbert A, Oler AT, Rabaglia, MR, Schneider LR, Stapleton DS, Keller M, Schueler KL, Coon JJ. (2012). An E3-ubiquitin ligase regulates the activity of an inhibitor of insulin secretion. *Diabetes*, 61 (Suppl. 1A); LB19

Oral Presentations

1. **Bhatnagar, S**, Phosphorylation and degradation of tomosyn-2 de-represses insulin secretion Boshell Diabetes and Metabolic 9th Annual Research Day, Auburn University, AL; Feb 26th, 2016
2. **Bhatnagar, S**, Phosphorylation and degradation of tomosyn-2 de-represses insulin secretion Midwest Islet Conference, Chicago, May 20th – 21st, 2015
3. **Bhatnagar S**, Identifying and characterizing novel regulators of insulin secretion. Seminar at the Department of Molecular Medicine, University of South Florida, Tampa, FL; January 14, 2015
4. **Bhatnagar S**, Identifying and characterizing novel regulators of insulin secretion. Seminar at the Obesity and Diabetes Center, University of Louisville, Louisville, KY; December 5, 2014
5. **Bhatnagar S**, Identifying and characterizing novel regulators of insulin secretion. Seminar at the Comprehensive Diabetes Center, University of Alabama at Birmingham, Birmingham, AL; November 6, 2014
6. **Bhatnagar S**, Identifying and characterizing novel regulators of insulin secretion. Faculty Seminar at the School of Biology, Georgia Institute of Technology, Atlanta, GA; August 21, 2014
7. **Bhatnagar S**, Identifying and characterizing novel regulators of insulin secretion. Spring Seminar Series, Department of Biochemistry, West Virginia University, Morgantown, WV; February 26, 2013
8. **Bhatnagar S**. Positional Cloning of a Type 2 Diabetes Quantitative Trait Locus: *Tomosyn-2*, a Negative Regulator of Insulin Secretion. Membrane Protein/Trafficking Seminar Series. Bock Laboratories, University of Wisconsin-Madison, WI; May 17, 2012
9. **Bhatnagar S**. Positional cloning of a type 2 diabetes quantitative trait locus; *Tomosyn-2*, a negative regulator of insulin secretion. The Midwest Islet Club Conference, University of Wisconsin-Madison, Madison, WI; May 25–27, 2011
10. **Bhatnagar S**. Fibroblast Growth Factor-19: A Novel Factor for Inhibiting Fatty Acid Synthesis. E.J. Van Liere Research Convocation and Research Day, West Virginia University, WV; 2008
11. **Bhatnagar S**. New Insights in Eukaryotic Transcription Termination. Department of Biochemistry and Molecular Pharmacology, West Virginia University, WV; 2005

Poster Presentations

1. Lindsay Wrighton, **Bhatnagar S**, Keller MP, Chapman E, Attie AD, Sytmaptotagmin-11 is required for the formation of the dense core in insulin granules. Midwest Islet Conference, Chicago, May 20th – 21st, 2015
2. **Bhatnagar S**, Schneider LR, Hebert A, Coon JJ, Attie AD. Insulin, cAMP, and phorbol ester-activated cell signaling pathways phosphorylate tomosyn-2 to regulate insulin secretion in pancreatic beta-cells. American Diabetes Association Conference: 73rd Scientific Sessions, Chicago, IL; June 21-25, 2013
3. **Bhatnagar S**, Schneider LR, Hebert A, Soni, MS, Keller MP, Coon JJ, Attie AD. Glucose, cAMP, And phorbol ester-activated cell signaling pathways phosphorylate tomosyn-2 to regulate insulin secretion in pancreatic beta-cells. Complex Trait Community 12th Annual Meeting, University of Wisconsin-Madison, Madison, WI; May 28-31, 2013
4. Soni MS, Keller MP, Rabaglia ME, **Bhatnagar S**, Shang J, Li J, Zhou H, Zhou YP, Kheterpal I, Mynatt R, Newgard CB, Howard AD, and Attie AD. MiRNAs 132 and 212 Result in a Down-Regulation of CACT, Leading to an Increase in Insulin Secretion Via Fatty Acyl-Carnitine Accumulation. The Midwest Islet Club Conference, University of Michigan, Ann Harbor, MI; May 22–23, 2013
5. Soni MS, Keller MP, Rabaglia ME, **Bhatnagar S**, Shang J, Zhou YP, Mynatt R, and Attie AD. MiRNAs 132 and 212 result in a down-regulation of CACT, leading to an increase in insulin secretion via accumulation of fatty acyl-carnitine molecules. Keystone Symposia: Diabetes - New Insights into Mechanism of Disease and its Treatment (J6), Keystone, CO; January 27 - February 1, 2013.
6. **Bhatnagar S**, Schneider LR, Hebert A, Coon JJ, Attie AD. Insulin, cAMP, and phorbol ester-activated cell signaling pathways phosphorylate tomosyn-2 to regulate insulin secretion in pancreatic beta-cells. Keystone Symposia: Diabetes - New Insights into Mechanism of Disease and its Treatment (J6), Keystone, CO; January 27 - February 1, 2013
7. **Bhatnagar S**, Hebert A, Oler AT, Rabaglia ME, Schneider LR, Stapleton DS, Schueler KL, Keller MP, Coon JJ, Attie AD. An E3-ubiquitin ligase regulates the activity of an inhibitor of insulin secretion. American Diabetes Association Conference: 72nd Scientific Sessions Pennsylvania Convention Center, Philadelphia, PA; June 8-12, 2012
8. **Bhatnagar S**, Oler AT, Rabaglia MR, Stapleton DS, Keller M, Schueler, KL Attie AD. Positional cloning of a type 2 diabetes quantitative trait locus; Tomosyn-2, a negative regulator of insulin secretion. Keystone Symposia: Pathogenesis of Diabetes: Emerging Insights into Molecular Mechanisms (J8), Santa Fe, NM; Jan 29–Feb 3, 2012
9. **Bhatnagar S**, Oler AT, Rabaglia MR, Stapleton DS, Keller M, Schueler, KL Attie AD. Positional cloning of a type 2 diabetes quantitative trait locus; Tomosyn-2, a negative regulator of insulin secretion. The Metabolism of Lipids: Implication in Human Diseases, 34th Steenbock Symposium, Madison, WI; May 22–25, 2011
10. **Bhatnagar S**, Oler AT, Rabaglia MR, Stapleton DS, Keller M, Schueler, KL Attie AD. Positional cloning of a type 2 diabetes quantitative trait locus; Tomosyn-2, a negative regulator of insulin secretion. The Midwest Islet Club Conference, University of Wisconsin-Madison, Madison, WI; May 25–27, 2011
11. **Bhatnagar S**, Oler AT, Rabaglia MR, Stapleton DS, Keller M, Schueler KL Attie AD. The role of tomosyn-2 in insulin secretion. The Midwest Islet Club Conference, Indiana University School of Medicine, Indianapolis, IN; May 26–27, 2010
12. Oler AT, **Bhatnagar S**, Rabaglia MR, Stapleton DS, Keller M, Schueler KL, Fusilier AM, Attie AD. Defective insulin secretion attributed to a diabetes susceptibility locus on mouse chromosome 16. The Midwest Islet Club Conference, St Louis, MO; May 27–29, 2009

13. **Bhatnagar S**, Hillgartner FB. Fibroblast Growth Factor-19: A Novel Factor for Inhibiting Fatty Acid Synthesis. FASEB Summer Conferences: Molecular Mechanisms Involved in the Nutrient Control of Cellular Function, Carefree, Arizona; July 20–25, 2008
14. **Bhatnagar S**, Hillgartner FB. Fibroblast Growth Factor-19 Inhibits Fatty Acid Synthesis in Hepatocytes in Culture. Keystone symposia: Diabetes Mellitus, Insulin Action and Resistance (A6), Breckenridge, CO; January 22–27, 2008
15. **Bhatnagar S**, Hillgartner FB. Fibroblast Growth Factor-19 Inhibits Fatty Acid Synthesis in Hepatocytes in Culture. Nuclear Receptors in Liver and Digestive Diseases: A Research Workshop, Rockville, MD; November 7–8, 2007
16. **Bhatnagar S**, Hillgartner FB. Fibroblast Growth Factor-19 Inhibits Fatty Acid Synthesis in Hepatocytes in Culture. E.J. Van Liere Research Convocation and Research Day, West Virginia University, WV; 2007
17. Srivastava A, Prakash NT, **Bhatnagar S**, Kumar A, Gupta U, Sadana, J. Selenium Toxicity in Waters, Soils and Crops in Nawashahar Region of India. 8th International Symposium on Selenium in Biology and Medicine, Selenium, University of Wisconsin, Madison, WI; July 25–30, 2006
18. **Bhatnagar S**, Hillgartner FB. Fibroblast Growth Factor-19 Inhibits the Actions of Insulin, Thyroid Hormone, and Liver X Receptor Agonists on Lipogenic Gene Expression in Liver. E.J. Van Liere Research Convocation and Research Day, West Virginia University, WV; 2006

Honors and Awards

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| 2012 | Keystone Scholarship: Pathogenesis of Diabetes: Emerging Insights into Molecular Mechanisms (J8), Santa Fe, NM; Jan 29-Feb 3, 2012 |
| 2008 | Best Poster Award: 2008 FASEB Summer Conferences: Molecular Mechanisms Involved in the Nutrient Control of Cellular Function, Carefree, Arizona; July 20–25, 2008 |
| 2008 | Best Poster Award: 2008 E. J. Van Liere Convocation and Research Day, West Virginia University, WV |
| 2008 | Top 10 Abstracts for Oral Presentations – 2008 E. J. Van Liere Convocation and Research Day, West Virginia University |
| 2008 | Pfizer Global Research and Development Scholarship Award: Keystone Symposia on Diabetes Mellitus, Insulin Action, and Resistance (A6), Breckenridge, CO; January 22–27, 2008 |
| 2008 | Graduate Student Travel Award , School of Medicine, West Virginia University |

Grants

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| 2016-2019 | 4R00DK095975-03, NIDDK, NIH; The role of tomosyn-2 in insulin secretion |
| 2014-2015 | K99 NIH Pathways to Independence award, NIDDK Grant #1K99DK095975-01. |
| June 2011–
June 2012 | American Diabetes Association Mentor-Based Fellowship 7-11-MN-03 07/01/11-06/30/15 |

Educational Activities and Presentations

Classroom Teaching

January 2014–May 2014	Instructor, Course: Biochem729 Advanced Topics; Graduate Level Course, Department of Biochemistry, University of Wisconsin-Madison
2011 and 2010	Graduate Biochemistry 710, “Regulation of Lipogenic Genes: Role of SREBP-1c”. Guest Lecture, Department of Biochemistry, University of Wisconsin-Madison
2004–2005	Small group facilitator and study group leader, School of Medicine, West Virginia University. Course: Medical Biochemistry
2002–2003	Teaching Assistant, Department of Biochemistry and Molecular Biology, West Virginia University <i>Course: Biochemistry</i>
August 2001–May 2002	Teaching Assistant, Department of Chemistry, University of Houston <i>Course: Organic Chemistry</i>

Laboratory Mentoring and Training

Graduate Research Co-Mentor

2009–2010	Sara Worzella, M.S., Genetics, University of Wisconsin-Madison
2011–Present	Lindsay R. Schneider, Ph.D. Candidate Pathology Graduate Program, University of Wisconsin-Madison
2013-Present	Mufaddal Soni, Ph.D. Candidate Biochemistry Graduate Program, University of Wisconsin-Madison

Undergraduate Research Mentor, University of Wisconsin-Madison

Dec 2012-Present	Amber Zhou, Brooke Sample, Josh Taylor
January 2012–Dec 2013	Amber Zhou and Kaia Stroud, Medicine 699, Independent Study
May 2012–Aug-2013	Kaitlyn Waldron, Medicine 699, Independent Study
January 2012–May 2012	Minhui Su, Exchange student at University of Wisconsin-Madison
May 2010–May 2012	Ming Mu, Medicine 699, Independent Study
May 2009–May 2011	Nathan Truchan, Medicine 699, Independent Study
January 2009-May 2010	Amanda Fusilier, Medicine 699, Independent Study
May 2010–August 2010	Tapojyoti Das, Khorana Scholar

Press Releases

2011	Work featured “ Diabetes gene identified: tomosyn-2 regulates insulin secretion” in several national and international media (Science Daily, USA; Press Association, UK; Times of India, India; etc.), October, 2011
2008	Work featured, “WVU research shows new class of hormones may reverse diabetes and obesity: Graduate student’s presentation wins international award” Health Newsletter, October 2008, West Virginia University
2008	Work featured, “WVU research shows new class of hormones may reverse diabetes and obesity: Graduate student’s presentation wins international award” Pittsburgh Post Gazette, October 2008

Service

2012 Ad Hoc reviewer, BMC Series of Journals
2012 Ad Hoc Reviewer, Diabetologia
2011 Ad Hoc Reviewer, Journal of Lipid Research
2011 Ad Hoc Reviewer, PLoS One