

ATUL CHOPRA, MD, PhD

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Atul.Chopra@HarringtonDiscovery.org

EDUCATION

- 1996 – 2003* **M.D.**
MIMER Medical College
Pune, India
- 2005 – 2010* **Ph.D.**
Advisor: Bert W. O'Malley, MD
Baylor College of Medicine
Houston, TX
- 2010 – 2014* **Internship and Residency, Medical Genetics**
Baylor College of Medicine
Houston, TX

PROFESSIONAL APPOINTMENTS

- 2018 – present* **Harrington Investigator**
Associate Director, Harrington Rare Disease Program
Harrington Discovery Institute at University Hospitals
Cleveland, OH
- 2018 – present* **Assistant Professor**
Department of Medicine
University Hospitals Cleveland Medical Center
Cleveland, OH
- 2019 – present* **Assistant Professor**
Department of Genetics and Genomics
Case Western Reserve University
Cleveland, OH
- 2018 – present* **Attending Medical Geneticist**
Clinic for Genetic Disorders of Energy Balance
Center for Human Genetics
University Hospitals Cleveland Medical Center
Cleveland, OH
- 2014 – 2018* **Caroline Wiess Law Scholar, Assistant Professor**

Department of Molecular and Human Genetics, Department of Molecular
and Cellular Biology
Baylor College of Medicine
Houston, TX

2016 – 2018 **Attending Medical Geneticist**
Pediatric Genetics Clinic
Texas Children’s Hospital
Houston, TX

BOARD CERTIFICATION

2015 – 2025 **Clinical Genetics**
American Board of Medical Genetics and Genomics

MEDICAL LICENSURE

2018 – 2021 **Physician Permit # 35.133931**
State Medical Board of Ohio

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- American Society of Human Genetics
- American Diabetes Association
- Endocrine Society

HONORS AND AWARDS

2014 – 2015 **Alkek Center for Molecular Discovery Pilot Award**
Alkek Center for Molecular Discovery
Baylor College of Medicine, Houston, TX

2014 – 2015 **Chao Physician-Scientist Award**
The Dan L. Duncan Institute for Clinical and Translational Research
Baylor College of Medicine, Houston, TX

2014 – 2019 **K08 Clinical Scientist Development Award, DK102529**
National Inst. Of Diabetes And Digestive And Kidney Diseases (NIDDK)

2014 – 2020 **Department of Molecular and Human Genetics laboratory startup**
Baylor College of Medicine, Houston, TX

2014 – 2020 **Department of Molecular and Cellular Biology laboratory startup**
Baylor College of Medicine, Houston, TX

2014 – 2019 **Caroline Wiess Law Scholar Award for Academic Excellence**

Baylor College of Medicine, Houston, TX

- 2018 **Michael E. DeBakey, M.D., Excellence in Research Award**
Baylor College of Medicine, Houston, TX
- 2018 – 2023 **R01, DK118290 (Role: PI)**
National Inst. Of Diabetes And Digestive And Kidney Diseases (NIDDK)
- 2018 – 2023 **Harrington Investigatorship**
Harrington Discovery Institute at University Hospitals
Cleveland OH
- 2020 – 2023 **R01, DK125403 (Role: PI)**
National Inst. Of Diabetes And Digestive And Kidney Diseases (NIDDK)

PROFESSIONAL SERVICE

Local

- Search committee for Director, Center of Excellence in Diabetes and Obesity, CWRU
- Member, Center for Integrated and Novel Approaches in Vascular Metabolic Disease, CWRU
- Member, Digestive Health Research Institute, CWRU
- Faculty mentor: Digestive Health Research Institute T35 training grant, CWRU
- Reviewer, Harrington Scholar Innovator grant program, HDI
- Reviewer, Harrington-Oxford Rare Disease grant program, HDI
- Clinical service: Director, Clinic for Genetic Disorders of Energy Balance, Center for Human Genetics, University Hospitals

National

- Ad hoc reviewer, CIDO study section, NIDDK
- Ad hoc reviewer for multiple scientific journals

International

- Associate Director, Oxford-Harrington Rare Disease Center at the Harrington Discovery Institute, Cleveland, and Oxford University, UK

PAST AND PRESENT TEACHING

- Mentor two MSTP students in my laboratory
- Mentor medical Genetics residents and CWRU medical students in the Center for Human Genetics at UH
- Classroom teaching:
 - April 2016* **“Glycogen Synthesis and Utilization in Health and Disease”**
Regulation of Energy Homeostasis GS-CB-468
Graduate School of Biomedical Sciences
Baylor College of Medicine, Houston, TX
 - October 2017* **“Insulin, Energy and Fat: A New Hormone Enters the Picture”**
Mechanisms of Cardinal Manifestations of Disease

School of Medicine
Baylor College of Medicine, Houston, TX

BIBLIOGRAPHY

1. **Chopra AR***, Louet JF*, Saha P, An J, Demayo F, Xu J, York B, Karpen S, Finegold M, Moore D, Chan L, Newgard CB, O'Malley BW. Absence of the SRC-2 Coactivator Results in a Glycogenopathy Resembling Von Gierke's Disease. *Science*. 2008 Nov 28;322(5906):1395-9.
 * Equal contribution
 ** This article was featured in the following editorial –
 i. Cheng A, Saltiel AR. Von Gierke's disease adopts an orphan (and its partner). *Sci Signal*. 2009 Feb 17;2(58):pe8.
2. Bochkis IM, Schug J, Rubins NE, **Chopra AR**, O'Malley BW, Kaestner KH. Foxa2-Dependent Hepatic Gene Regulatory Networks Depend on Physiological State. *Physiol Genomics*. 2009 Jul 9;38(2):186-95.
3. Louet JF*, **Chopra AR***, Sagen JV, An J, York B, Tannour-Louet M, Saha PK, Stevens RD, Wenner BR, Ilkayeva OR, Bain JR, Zhou S, Demayo F, Xu J, Newgard CB, O'Malley BW. The Coactivator SRC-1 is an Essential Coordinator of Hepatic Glucose Production. *Cell Metabolism*. 2010 Dec 1;12(6):606-18.
 * Equal contribution
4. **Chopra AR**, Kommagani R, Saha P, Song J, Jeong JW, Louet JF, Salazar C, Finegold M, Viollet B, Demayo F, Chan L, Moore D, O'Malley BW. Cellular Energy Depletion Resets Whole-Body Energy by Promoting Coactivator Mediated Dietary Fuel Absorption. *Cell Metabolism*. 2011 Jan 5;13(1):35-43.
 * This article was featured in the following editorial -
 i. Ferré P, Foufelle F. A New Role for a Metabolic Star: AMP-Activated Protein Kinase Stimulates Fat Absorption. *Cell Metabolism*. 2011 Jan 5;13(1):1-2.
 ii.
5. York B, Reineke EL, Sagen JV, Nikolai BC, Zhou S, Louet JF, **Chopra AR**, Chen X, Reed G, Noebels J, Adesina AM, Yu H, Wong LJ, Tsimelzon A, Hilsenbeck S, Stevens RD, Wenner BR, Ilkayeva O, Xu J, Newgard CB, O'Malley BW. Ablation of Steroid Receptor Coactivator-3 Resembles the Human CACT Metabolic Myopathy. *Cell Metabolism*. 2012 May 2;15(5):752-63.
6. York B, Sagen JV, Tsimelzon A, Louet JF, **Chopra AR**, Reineke EL, Zhou S, Stevens RD, Wenner BR, Ilkayeva O, Bain JR, Xu J, Hilsenbeck SG, Newgard CB, O'Malley BW. Research resource: tissue- and pathway-specific metabolomic profiles of the steroid receptor coactivator (SRC) family. *Mol Endocrinol*. 2013 Feb;27(2):366-80.
7. Wangler MF, Gonzaga-Jauregui C, Gambin T, Penney S, Moss T, **Chopra A**, Probst FJ, Xia F, Yang Y, Werlin S, Eglite I, Kornejeva L, Bacino CA, Baldrige D, Neul J,

- Lehman EL, Larson A, Beuten J, Muzny DM, Jhangiani S, Gibbs RA, Lupski JR, Beaudet A. Heterozygous de novo and inherited mutations in the smooth muscle actin (ACTG2) gene underlie megacystis-microcolon-intestinal hypoperistalsis syndrome. ***PLoS Genet.*** 2014 Mar 27;10(3) :e1004258.
8. Romere C, Duerrschmid C, Bournat J, Constable P, Jain M, Xia F, Saha PK, Del Solar M, Zhu B, York B, Sarkar P, Rendon DA, Gaber MW, LeMaire SA, Coselli JS, Milewicz DM, Sutton VR, Butte NF, Moore DD, **Chopra AR**. Asprosin, a Fasting-Induced Glucogenic Protein Hormone. ***Cell.*** 2016 Apr 21;165(3):566-579
 * This article was featured in the following editorials –
 i. Gene Hunting Reveals New Hormone. Garber KB. ***American Journal of Human Genetics.*** 2016 May 5, 98(5):799-800.
 ii. Asprosin - new hormone involved in hepatic glucose release. Greenhill C. ***Nat Rev Endocrinol.*** 2016 Jun;12(6):312.
 iii. Metabolic disease: Novel fat-secreted hormone regulates glucose homeostasis. Crunkhorn S. ***Nat Rev Drug Discov.*** 2016 Jun;15(6):382-3.
9. Duerrschmid C, He Y, Wang C, Li C, Bournat J, Romere C, Saha PK, Lee M, Phillips KJ, Jain M, Jia P, Zhao Z, Farias M, Wu Q, Milewicz DM, Sutton VR, Moore DD, Butte NF, Krashes MJ, Xu Y*, **Chopra AR***. Asprosin is a Centrally Acting Orexigenic Hormone. ***Nature Medicine.*** 2017 Nov 6; 131(53)
 * Equal contribution
 ** This article was featured in the following editorial –
 i. Beutler LR, Knight ZA. A Spotlight on Appetite. ***Neuron.*** 2018 Feb 21;97(4):739-741.
10. Hoffmann J, Xie W, **Chopra AR**. The Energy Regulation Mechanism and Therapeutic Potential of Asprosin. ***Diabetes.*** 2020 Apr;69(4):559-566.
11. Mishra I, Duerrschmid C, Ku Z, He Y, Xie W, Silva ES, Hoffmann J, Xin W, Zhang N, Xu Y, An Z, **Chopra AR**. Asprosin Neutralizing Antibodies as a Treatment for Metabolic Syndrome. ***Elife.*** 2021 Apr 27;10:e63784.

PATENTS

1. **Identification of a new polypeptide hormone for maintenance of optimal body weight and blood glucose**
 Inventors: Atul Chopra, David Moore
 Active (2014 – 2034): AU, JP, US, CN
2. **Methods for stimulation of appetite and increase in weight by administration of asprosin**
 Inventors: Atul Chopra, David Moore
 Active (2014 – 2034): AU, JP, US, CN

POPULAR MEDIA COVERAGE

- April 2016* **“Hormone Discovery Could End Daily Jabs for Diabetes”**
Oliver Moody
The Times
- April 2016* **“A Newly Discovered Hormone Could Lead to New Treatments for Type 2 Diabetes”**
Bob Hirshon
American Association for the Advancement of Science
- April 2016* **“Newly Discovered Hormone Could Fight Type 2 Diabetes and Obesity”**
Andy Coghlan
New Scientist
- November 2016* **“The Thin Gene”**
Pagan Kennedy
The New York Times
- March 2017* **“Woman’s Rare Genetic Disorder Could Hold the Key to Weight Loss”**
Jim Axelrod
CBS Evening News with Scott Pelley
- November 2017* **“Hormone Loss Prevents Obesity and Diabetes in Mice”**
Abby Olena
The Scientist
- February 2018* **“A Scientific Breakthrough May Lead to an Effective Anti-Obesity Drug”**
Roni Jacobson
CNBC.com

PRESENTATIONS**PROFESSIONAL MEETINGS**

- February 2016* **Keystone Symposia: Obesity and Adipose Tissue Biology**
Banff, AB, Canada, February 15-19, 2016
Selected Speaker
- October 2016* **Individualizing Medicine Conference**
Rochester, MN, October 5-7, 2016
Invited Speaker

- October 2016* **American Society of Human Genetics**
Vancouver, BC, Canada October 18-22, 2016
Plenary Speaker
- October 2016* **11th Annual Peptide Therapeutics Symposium**
La Jolla, CA, October 27-28, 2016
Plenary Speaker
- July 2017* **Gordon Research Conference: Elastin, Elastic Fibers & Microfibrils**
Biddeford, ME, July 30 – August 4, 2017
Invited Speaker
- August 2017* **Danish Diabetes Academy Summer School**
Gl. Avernæs, Denmark, August 28-31, 2017
Keynote Speaker
- September 2017* **3rd International Symposium on Innovative R&D & Translational Strategy**
Chengdu, China, September 28-31, 2017
Invited Speaker
- October 2017* **Metabolism in Action Conference, Copenhagen Biosciences Summit**
Copenhagen, Denmark, October 1-4, 2017
Invited Speaker
- April 2018* **CNS Regulation of Metabolism, University of Washington Diabetes Center - Annual Symposium**
Seattle, WA, May 3rd, 2018
Invited Speaker
- June 2018* **American Diabetes Association's 78th Scientific Sessions**
Orlando, FL June 22-26, 2018
Invited Speaker
- October 2018* **American Society for Matrix Biology Biennial Meeting 2018**
Las Vegas, NV October 14-17, 2018
Plenary Speaker
- February 2019* **Keystone Symposia: Neurocircuitry of Appetite**
Banff, AB, Canada, February 14-19, 2019
Invited Speaker
- July 2019* **Gordon Research Conference: Elastin, Elastic Fibers & Microfibrils**
Manchester, NH, July 21-26, 2019
Invited Speaker

UNIVERSITIES AND RESEARCH INSTITUTIONS

- September 2016* **University of Texas Health Science Center**
Houston, TX, September 2nd, 2016
- January 2017* **Department of Pediatrics, University of Michigan**
Ann Arbor, MI, January 3rd, 2017
- January 2017* **Department of Pediatrics, University of California San Francisco**
San Francisco, CA, January 17th, 2017
- January 2017* **The Naomi Berrie Diabetes Center, Columbia University**
New York, NY, January 19th, 2017
- January 2017* **Mayo Clinic**
Jacksonville, FL, January 25th, 2017
- February 2017* **Endocrine Division, Washington University Medical Center**
St. Louis, MO, February 17th, 2017
- April 2017* **Diabetes Center, University of California San Francisco**
San Francisco, CA, April 5th, 2017
- May 2017* **Department of Human Genetics, University Of Michigan**
Ann Arbor, MI, May 1st, 2017
- July 2017* **Harrington Discovery Institute, University Hospitals**
Cleveland, OH, July 14th, 2017
- October 2017* **Diabetes Research and Training Center, Vanderbilt University**
Nashville, TN, October 27th, 2017
- December 2017* **Oregon National Primate Research Center, OHSU**
Portland, OR, December 6th, 2017
- September 2018* **Department of Cellular and Molecular Medicine, Cleveland Clinic
Lerner Research Institute**
Cleveland, OH, September 21st, 2018
- October 2018* **Department of Genetics & Genomics Grand Rounds, Case Western
Reserve University**
Cleveland, OH, November 27th, 2018
- November 2018* **Department of Medicine Grand Rounds, Case Western Reserve
University**

Cleveland, OH, November 27th, 2018

CURRENT TRAINEES

<i>2018– Present</i>	Ila Mishra, PhD Postdoctoral Fellow
<i>2019– Present</i>	Brian Kim, BS MSTP Student
<i>2020– Present</i>	Elizabeth Sabath, PhD Postdoctoral Fellow
<i>2020– Present</i>	Bijoya Basu, BS MSTP Student
<i>2020– Present</i>	Bikash Dangi, PhD Postdoctoral Fellow

FORMER TRAINEES

<i>2018– 2019</i>	Jennifer Hoffman, BS Research Assistant
<i>2017– 2019</i>	Wei “Rose” Xie, PhD Postdoctoral Fellow
<i>2015– 2019</i>	Clemens Duerrschmid, PhD American Heart Association Postdoctoral Fellow
<i>2018</i>	Kunlun Li, PhD Postdoctoral Fellow
<i>2015 – 2018</i>	Juan Bournat, PhD Postdoctoral Fellow
<i>2017– 2018</i>	Giovanni Monterroso, BS BCM PREP Scholar
<i>2015 – 2016</i>	Petra Constable, BS Research Assistant
<i>2013 – 2015</i>	Chase Romere, BS Research Assistant