

## Marc D Ruben, PhD

Postdoctoral Fellow, Cincinnati Children's Hospital

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### EDUCATION

**PhD in Molecular Genetics and Neurobiology** **2011**

New York University, New York, NY

**BS in Physiology**

Rutgers University, New Brunswick, NJ **2001**

### RESEARCH AND PROFESSIONAL EXPERIENCE

**Postdoctoral Fellow** **Oct 2016 – present**

*Cincinnati Children's Hospital Medical Center*

*Division of Human Genetics, John Hogenesch Lab*

I apply computational and molecular tools to study biological timing and its impact on health.

The assembly of a first human atlas of circadian gene expression (Ruben et al, *Sci Transl Med* 2018) identified hundreds of dynamic disease and drug targets. I am using animal models and clinical data (Ruben et al, *Science* 2019; Ruben et al, *PNAS* 2019; Ruben et al, *medRxiv* 2021) to test hypotheses and explore ways in which biological timing matters for medicine.

**Life Sciences Consultant** **2011 – 2015**

*Defined Health, Florham Park, NJ*

As consultant to the bio-pharmaceutical industry, I lead 'opportunity assessment' projects to evaluate scientific and commercial potential for R&D-stage drugs and devices. These projects helped guide client decisions on licensing, acquisition, and internal development of therapeutic programs in oncology, neurology, and cardiology.

**Predocctoral Fellow** **2005 – 2011**

*New York University, Department of Biology*

My doctoral research applied single cell-type genomic approaches to the *Drosophila* circadian system, and found new clock-controlled output (*Journal of Biological Rhythms*, 2012) and input (*Current Biology* 2012; *Neuron* 2010) regulators of molecular and behavioral rhythms.

**R&D Assistant Scientist** **2002 – 2004**

**Research Technician** **2001 – 2002**

*Orchid BioSciences, Princeton, NJ*

### PUBLICATIONS

#### Research

1. **Ruben MD**, Francey LJ, Wu G, Smith DF, Fitzgerald GA, Hughey JJ, Hogenesch JB. *Factors Associated with Medicine Timing Effects: A Meta-analysis*. medRxiv. 2021 Sep.
2. Wu G, Francey LJ, **Ruben MD**, Hogenesch JB. *Normalized coefficient of variation (nCV): a method to evaluate circadian clock robustness in population scale data*. Bioinformatics. 2021 Sep (accepted).

3. Wu G, Lee YY, Gulla EM, Potter A, Kitzmiller J, **Ruben MD**, Salamonis N, Whitsett JA, Francey LJ, Hogenesch JB, Smith DF. *Short-term exposure to intermittent hypoxia leads to changes in gene expression seen in chronic pulmonary disease*. eLife. 2021 Feb.
4. Wu G, **Ruben MD**, Francey LJ, Smith DF, Sherrill JD, Oblong JE, Mills KJ, Hogenesch JB. *A population-based gene expression signature of molecular clock phase from a single epidermal sample*. Genome Medicine. 2020 Aug.
5. **Ruben MD**, Francey LJ, Guo Y, Wu G, Cooper EB, Shah AS, Hogenesch JB, Smith DF. *A Large-scale Study Reveals 24 hour Operational Rhythms in Hospital Treatment*. PNAS. 2019 Oct.
6. **Ruben MD**, Smith DF, Fitzgerald GA, Hogenesch JB. *Dosing Time Matters*. Science. 2019 Aug.
7. Wu G, **Ruben MD**, Schmidt RE, Francey LJ, Smith DF, Anafi RC, Hughey JJ, Tasseff R, Sherrill JD, Oblong JE, Mills KJ, Hogenesch JB. *Population level rhythms in human skin: implications for circadian medicine*. PNAS. 2018 Oct.
8. **Ruben MD**, Wu G, Smith DF, Schmidt RE, Francey LJ, Lee YY, Anafi RC, Hogenesch JB. *A database of tissue-specific rhythmically expressed human genes has potential applications in circadian medicine*. Science Translational Medicine. 2018 Sep.
9. \*Mizrak D., \***Ruben M.**, Myers G., Rhissorakrai K., *Gunsalus K., Blau J. Electrical Activity Can Impose Time of Day on the Circadian Transcriptome of Pacemaker Neurons*. Current Biology. 2012 Oct. [\*co-first authors]
10. **Ruben M**, Drapeau MD, Mizrak D, Blau J. *A Mechanism for Circadian Control of Pacemaker Neuron Excitability*. Journal of Biological Rhythms. 2012 Oct.
11. Dahdal D, Reeves DC, **Ruben M**, Akabas MH, Blau J. *Drosophila pacemaker neurons require G Protein signaling and GABAergic inputs to generate twenty-four hour behavioral rhythms*. Neuron. 2010 Dec.
12. Ginsberg, SD, Elarova, I, **Ruben, M**, Tan, F, Counts, SE, Eberwine, JH, Trojanowski, JQ, Hemby, SE, Mufson, EJ, Che, S. *Single-cell gene expression analysis: implications for neurodegenerative and neuropsychiatric disorders*. Neurochemical Research. 2004 Jun.

### Chapters / Commentary

1. Wu G, **Ruben MD**, Lee YY, Li J, Hughes ME, Hogenesch JB. *Genome-wide studies of time of day in the brain: Design and analysis*. Brain Science Advances. 2020 Jul.
2. Smith DF, **Ruben MD**, Francey LJ, Walch, OJ, Hogenesch JB. *When Should You Take Your Medicines?* J Biol Rhythms. 2019 Dec.
3. **Ruben MD**, Hogenesch JB, Smith DF. *Sleep and Circadian Medicine: Time of Day in the Neurologic Clinic*. Neurologic Clinics. 2019 Aug.
4. von Allmen DC, Francey LJ, Rogers GM, **Ruben MD**, Cohen AP, Wu G, Schmidt RE, Ishman SL, Amin RS, Hogenesch JB, Smith DF. *Circadian Dysregulation: The Next Frontier in Obstructive Sleep Apnea Research*. Otolaryngol Head Neck Surg. 2018 Sep.

5. Hughes ME, Abruzzi KC, Allada R., [and 90 others, including **Ruben MD**]. *Guidelines for Genome-Scale Analysis of Biological Rhythms*. J Biol Rhythms. 2017 Oct.
6. **Ruben MD**, Hogenesch JB. *Circadian Rhythms: Move Over Neurons - Astrocytes Mediate SCN Clock Function*. Current Biology. 2017 May.
7. Blau J, Blanchard F, Collins B, Dahdal D, Knowles A, Mizrak D, **Ruben M**. What is There Left to Learn About the Drosophila Clock? Cold Spring Harb Symp Quant Biol. 2007.

## INVITED PRESENTATIONS

### Talks

- Mar 2021 ASPEN 2021 Nutrition Science & Practice Conference, Virtual
- Dec 2019 Washington State University, Elon S. Floyd College of Medicine
- Oct 2019 Rutgers University, Institute for Translational Medicine and Science
- Feb 2019 Grand Rounds — Head & Neck Surgery, University of Cincinnati Medical School, Cincinnati, OH
- May 2018 Society for Biological Rhythms Conference, Amelia Island, FLA
- Jun 2011 CSHL Neurobiology of Drosophila Conference, Cold Spring Harbor, NY.
- Jun 2008 Society for Biological Rhythms Conference, Destin, FL

### Posters (recent)

- Jun 2020 Society for Biological Rhythms Conference, Virtual
- Jun 2019 Gordon Research Conference on Chronobiology, Barcelona, Spain
- May 2018 Society for Biological Rhythms Conference, Amelia Island, FLA

## TEACHING & MENTORING

### **RaMP Mentor** **2020 – present**

*University of Cincinnati*, Research and Mentoring Program (RaMP)  
Working with an undergraduate student to develop a research project

### **SRI Mentor** **2021 – present**

*Summit High School*, Science Research Institute (SRI)  
Working one-on-one with highschool students who plan to seek degrees / careers in the sciences to develop skills in programming, statistics, and project design

### **Howard Hughes Teaching Assistant Fellow** **2009 – 2011**

*New York University, Department of Biology*  
Assisted in developing and teaching a new bioinformatics curriculum for undergraduate Molecular Biology courses.

### **Teaching Assistant** **2005 – 2008**

*New York University, Department of Biology*  
Lead instruction of laboratory Principles of Biology I and II courses.

## **ACADEMIC SERVICE**

### **Professional training**

*Led workshops for postdocs and junior faculty*

2020 SRBR conference, Virtual

2018 SRBR conference, Amelia Island, FL.

### **Peer reviewer for**

Proceedings of the National Academy of Sciences (PNAS)

PLOS Genetics

Nature

Journal of Biological Rhythms

Trends in Genetics

eLIFE

Cancer Research

PeerJ

Science Translational Medicine

BMC Bioinformatics

Journal of Computational Biology

## **AWARDS / FELLOWSHIPS**

Howard Hughes Teaching Assistant Fellowship, New York University, 2009-2011.

MacCracken Doctoral Research Fellowship, New York University, 2005-2010.

Cell Press 1st Place Abstract for Trainee, Society for Research on Biological Rhythms, 2008.

Highest Distinction on PhD qualifying examination, New York University. 2005.

## **REFERENCES**

### **John B. Hogenesch, PhD**

Ohio Eminent Scholar

Deputy Director, Center for Chronobiology

Professor of Pediatrics

Divisions of Human Genetics and Immunobiology

Cincinnati Children's Hospital Medical Center

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### **Garret FitzGerald, MD**

Professor of Medicine and Systems Pharmacology and Translational Therapeutics

McNeil Professor in Translational Medicine and Therapeutics

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### **Justin Blau, PhD**

Professor of Biology and Neural Science

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