

Dr. Frankie D. Heyward
Curriculum Vitae

Date Prepared: 8/22/2024

Name: Frankie D. Heyward

Position: Tenure-Track Assistant Professor, Department of Internal Medicine and Neuroscience (2023 - Present)

Office Address: UT Southwestern Medical Center
Center for Hypothalamic Research
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Education:

<u>Year</u>	<u>Degrees</u>	<u>Field of Study</u>	<u>Institution</u>
2009	B.A.	Psychology and Biology (Degree with Distinction)	University of Delaware
2015	Ph.D.	Neurobiology (Laboratory of Dr. David Sweatt)	University of Alabama at Birmingham

Postdoctoral Training:

<u>Year</u>	<u>Title</u>	<u>Institution</u>
2015-2023	Postdoctoral Fellow (Laboratory of Dr. Evan D. Rosen)	Beth Israel Deaconess Medical Center Harvard Medical School Broad Institute
2023-2023	Instructor in Medicine	Beth Israel Deaconess Medical Center Harvard Medical School

Major Administrative Leadership Positions:

Local

<u>Year</u>	<u>Position</u>	<u>Institution</u>
2006-2008	Vice Polemarch (Vice President)	University of Delaware Chapter of Kappa Alpha Psi Fraternity, Inc. (Nu Xi Chapter)

2006-2007	Vice President, National Pan-Hellenic Council	University of Delaware
2013-2014	Founding Chair, Graduate Biomedical Science Outreach Committee (GBSO)	University of Alabama at Birmingham, Graduate Biomedical Sciences (GBS)
2020-2022	Founding Chair, Harvard Medical School Black Postdoctoral Association	Harvard Medical School (HMS)
2021	Co-Director, Nutrition and Obesity Research Center of Harvard Associate Member Counsel	Nutrition and Obesity Research Center of Harvard (NORCH)

National

Year	Position	Institution
2020-	President and Founding Chair	National Black Postdoctoral Association, Inc. (NBPA)

Committee Service:

Local

Year	Position	Institution
2020-2023	Harvard Medical School Diversity and Inclusion Committee	Harvard Medical School

Professional Societies:

2008-	Cellular and Molecular Cognition Society
2009-	Society for Neuroscience
2010-2015	The Obesity Society
2013-	Phi Kappa Phi, Honor Society
2015-	Network of Minority Health Research Investigators (NMRI), NIDDK
2017-	American Heart Association
2018-	American Diabetes Association
2022-	Simons Foundation, Simons Collaboration on Plasticity and the Aging Brain (SCPAB)

Editorial Activities:

- **Ad hoc Reviewer**

Brain Research, PLOS ONE, Scientific Reports

Honors and Prizes:

2005 UD African American Student of Distinction Award Recipient
 2007 Inducted into NUCLEUS Program (Howard Hughes Medical Institute)
 2007 NUCLEUS Program (Howard Hughes Medical Institute) Academic Achievement Award
 2007 UD African American Student of Distinction Award Recipient
 2007 UD Undergraduate Research Program Award- **\$150**
 2007 Ronald D. McNair Post Baccalaureate Program Stipend- **\$3,000**
 2008 NUCLEUS (Howard Hughes Medical Institute) Academic Achievement Award
 2008 UD African American Student of Distinction Award Recipient
 2008 UD Undergraduate Research Program Award- **\$150**
 2008 Ronald D. McNair Post Baccalaureate Program Stipend- **\$3,000**
 2009 UD Undergraduate Research Program Award- **\$250**
 2009 Senior Thesis (Degree of Distinction), UD
 2009 Marine Biology Laboratory (MBL) SPINES Program Attendee
 2009 APA Diversity Program in Neuroscience Fellowship- Finalist
 2009 Comprehensive Minority Faculty and Student Development Program Fellowship
 2011 T32 Nutrition and Obesity Research Center Pro-doctoral Fellowship, UAB
 2013 Graduate Student Research Days – 3rd place, Session 6, UAB
 2013 UNCF/Merck Graduate Science Research Dissertation Fellowship Award **\$43,500 Fellowship**, plus **\$10,000** Research Grant
 2013 Network of Minority Health Research Investigator (NMRI) Excellence in Research Award (Basic Science), NIH NIDDK
 2015 Keystone Symposium Underrepresented Trainee Scholarship (Diabetes and Metabolic Dysfunction J6) - **\$1200**
 2015 T32 Postdoctoral Fellowship, Minority Supplement, BIDMC.
 2018 Regeneron Prize for Creative Innovation, BIDMC Postdoctoral Fellow (sole) Nominee
 2018 2018 ADA Travel Award - **\$1000**
 2018 American Heart Association (AHA) Postdoctoral Fellowship - **\$106,532**
 2018 Burroughs Wellcome Fund (BWF) Postdoctoral Enrichment Program Fellow - **\$60,000**
 2018 American Diabetes Association (ADA) Minority Postdoctoral Fellowship - **\$179,722**
 2019 NIH IMPACT.US Fellow, Institute of Medical Engineering and Science, MIT
 2019 Nutrition and Obesity Research Center of Harvard (NORCH) Pilot and Feasibility Grant for Under Represented Minorities - **\$30,000**
 2019 Nutrition and Obesity Research Center of Harvard (NORCH) Diversity Scholar
 2020 Nutrition and Obesity Research Center of Harvard (NORCH) Diversity Scholar
 2020 Brain & Behavior Research Foundation Young Investigator Grant - **\$70,000**
 2020 100 inspiring Black scientists in America (Cell Mentor)

2020	1000 inspiring Black scientists in America (Cell Mentor)
2021	Competitive Renewal for NORCH P&G grant - \$15,000
2022	Boston Nutrition and Obesity Research Center (BNORC) Pilot and Feasibility Grant for Under-Represented Minorities - \$57,999
2022	Duke Next Generation Leader (DNGL)
2022	Abstract Selected for an Oral Presentation at the Gordon Research Conference on Hypothalamus
2022	New England Science Symposium 2022 Award Winners RS Ruth and William Silen, M.D. Award. - \$500
2022	Simons Collaboration on Plasticity and the Aging Brain (SCPAB) Transition to Independence Award -- \$600,000
2022	Acknowledged by name by Harvard Medical School Dean Dr. George Q. Daley during his State of the School Address for my role in founding the HMS and National Black Postdoc Association
2022	Awarded \$70,000 in Salary support each year for up to 2 years until the start of the faculty appointment
2022	Application submitted by Dr. Evan Rosen, Chief of the Division of Endocrinology, Diabetes and Metabolism in the Department of Medicine at BIDMC, on Dr. Heyward's behalf to be promoted to Instructor at BIDMC
2023	Named a NIH-NIDDK Bringing Resources to Increase Diversity, Growth, Equity, & Scholarship for Obesity, Nutrition, & Diabetes Research (B.R.I.D.G.E.S) COURAGE Scholar and P&F award
2023	NIH/NIDDK K01 Research Scientist Development Award
2024	Nature (Nature Publishing Group) Changemaker

Report of Funded and Unfunded Projects

Past

2015-2018	NIH NIDDK 3 T32 DK 7516-32 S1 PI
2018-2018	“Cell-type specific epigenomic profiles as a tool to identify novel transcriptional pathways regulating weight loss” American Heart Association 18POST33990061 PI The goal of this sponsored research program was to support my salary as a postdoc.
2019-2021	“Cell-type specific epigenomic profiles as a tool to identify novel transcriptional pathways regulating food intake” American Diabetes Association PI The goal of this project is to use an integrative transcriptomic and epigenomic approach to identify transcription factors that govern the AgRP-neuron transcriptional program during changes in energy availability.
2021-2024	“A tool to study the cell-type specific epigenetic profiles” Brain and Behavior Research Foundation

- PI
The goal of this project is to develop a technique that enables cell-type specific, deeply sequenced, epigenomic and cistromic profiles from wildtype mouse and postmortem human patient samples.
- 2022-2023 “Determining the Direct Transcriptional Targets of IRF3 in AgRP Neurons”
NIH/NIDDK (BNORC)
PI
The goal of this project is to accomplish CUT&RUN for the endogenously-expressed transcription factor IRF3 in AgRP neurons in the fed, fasted, and leptin-treated state.
- 2023-2024 “Neuroepigenetic basis of anorexia and obesity-induce cognitive decline in old mice”
Simons Foundation, Simons Collaboration on Plasticity and the Aging Brain (SCPAB)
PI
This Simons Collaboration on Plasticity and the Aging Brain (SCPAB) Transition to Independence award provides up to 2 years of salary support (\$70,000/year) to last until the start of the tenure track faculty appointment, along with a \$10,000 resource and professional development allowance in year 2.
- Current**
- 2018-2023 “Cell-type specific epigenomic profiles as a tool to identify novel transcriptional pathways regulating weight loss”
Burroughs Wellcome Fund
PI
The goal of this project is to obtain transcriptomic and epigenomic profiles of low-input AgRP neurons during states of hunger and satiety.
- 2021-2022 “Determining the Direct Transcriptional Targets of STAT3 in AgRP Neurons”
NIH/NIDDK (NORCH)
PI
The goal of this competitive renewal project is to accomplish CUT&RUN for the transcription factor STAT3 in AgRP neurons and POMC neurons.
- 2024-2027 “Neuroepigenetic basis of anorexia and obesity-induce cognitive decline in old mice”
Simons Foundation, Simons Collaboration on Plasticity and the Aging Brain (SCPAB)
PI
This Simons Collaboration on Plasticity and the Aging Brain (SCPAB) Transition to Independence award provides \$600,000 (\$200,000/years for 3 years) in research support at the start of Dr. Heyward’s tenure-track faculty appointment.
- 2023-2025 “Role of hypothalamic IRF3 transcriptional dysregulation in obesity”
PI
NIDDK/NIH K01
This career development will fund an independent line of research that will be used to build my future independent research program.
- 2023-2024 “Single-cell multiomics to identify transcriptional pathways driving obesity in the mouse hypothalamus”
PI

COURAGE Pilot and Feasibility Grant Mechanism

This Pilot and Feasibility award will support my application of single-cell multiomics towards identifying transcriptional pathways that are dysregulated in leptin-sensitive neuronal populations.

Projects Submitted for Funding

2025-2029 “Identifying and targeting neuroepigenomic signatures of obesogenic memory to prevent weight regain”
PI
NIH Director’s New Innovator Award Program (DP2 Clinical Trial Optional)
This NIH grant will provide substantial funding to investigate an epigenetically-encoded form of obesogenic memory that promotes weight-regain in mice.

Report of Local Teaching and Training

Teaching of Students in Courses:

2011	Teacher’s Assistant: Mechanisms of Memory Graduate and Undergraduate Students	University of Alabama at Birmingham 1 hr/week
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Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):

Research Supervisory and Training Responsibilities:

2011-2015	Supervision of undergraduate researchers (average 3/year)	Daily mentorship
2017-2022	Supervision of animal technicians	Daily mentorship
2023-2023	Supervision of a research assistant	Daily mentorship

Other Mentored Trainees and Faculty:

2011-2013	Mark Coleman, B.A. Blazer Male Enrichment Network (BMEN) mentor and research mentor Currently working outside of STEM
2013-2015	Richard Trieu, MD Undergraduate mentor

Internal Medicine Resident, University of Arizona Internal Medicine Residency Program - Tucson Campus

2013-2015 Daniel Gilliam, B.S.
Undergraduate Honor's Neuroscience Research Mentor
PhD Program in Neuroscience, Harvard Medical School

2023- Bethany Maciel, B.S.
Research Technician
UT Southwestern

2023- Brookeen Sheffield, B.S.
Research Assistant
UT Southwestern

2023-2024 Razia Sultana, Ph.D.
Postdoctoral Research Fellow
UT Southwestern

2023- Aaron Aykut Uner, Ph.D.
Instructor
UT Southwestern

Local Invited Presentations:

- No presentations below were sponsored by 3rd parties/outside entities
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Report of Regional, National and International Invited Teaching and Presentations

- No presentations below were sponsored by 3rd parties/outside entities
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Regional

- 2020 "Determining the Direct Transcriptional Targets of STAT3 in AgRP Neurons"
Nutrition and Obesity Research Center of Harvard. Zoom Conference.
- 2020 Cell-type specific epigenomic profiles as a tool to identify novel transcriptional pathways regulating food intake. Black In Neuro. Zoom Conference.
- 2021 Cell-type specific epigenomic profiles as a tool to identify novel transcriptional pathways regulating food intake, Emory University Dept. of Human Genetics.

- 2021 Integrated Transcriptomic and Epigenomic Analysis of AgRP Neurons Identifies a Novel Mediator of Leptin-Induced Satiety. (University of North Carolina. Dept. of Genetics). Invited Talk: Wednesday Research Colloquium.
- 2021 Integrated transcriptomic and epigenomic analysis of AgRP neurons identifies a novel mediator of leptin-induced satiety. Alabama State University. Dept. of Genetics.
- 2021 Integrated transcriptomic and epigenomic analysis of AgRP neurons identifies a novel mediator of leptin-induced satiety. New England Science Symposium. Selected Speaker.
- 2021 Cis-regulatory analysis of AgRP neurons identifies a novel leptin-sensitive transcriptional effector. RuBrain: Mind over platter, a research panel discussion. Rutgers BRAIN. Selected Speaker.
- 2021 “AgRP Neuron Epigenomes across Hunger States Reveal Novel Transcriptional Effectors of Leptin”
Harvard Medical School Black Postdoctoral Association Inaugural Annual Conference (Harvard Medical School),
- 2022 Integrated genomic analysis of AgRP neurons reveals that IRF3 regulates leptin’s hunger-suppressing effects. Nutrition and Obesity Research Center of Harvard (NORCH) Associate Member Seminar (Mass General Hospital).
- 2022 AgRP neuron epigenomes across hunger states reveal that IRF3 mediates leptin's effects. Broad Institute Diabetes Research Group Meeting (Broad Institute of MIT and Harvard).
- 2022 AgRP neuron epigenomes across hunger states reveal that IRF3 mediates leptin's effects. Nutrition and Obesity Research Center of Harvard Associate Member Symposium.
- 2022 AgRP neuron epigenomes across hunger states reveal that IRF3 mediates leptin's effects. Duke Next Generation Leaders Seminar (Duke University). Selected Speaker.
- 2022 “AgRP Neuron Epigenomes across Hunger States Reveal Novel Transcriptional Effectors of Leptin”
Harvard Medical School Black Postdoctoral Association 2nd Annual Conference (Harvard Medical School),
- 2021 “Integrated genomic analysis of AgRP neurons reveals a novel transcriptional effector of the hunger-suppressing effects of leptin”
Research Conference, 15th Annual Broad Institute Scientific Retreat, Cambridge, MA
- 2023 “Integrated genomic analysis of AgRP neurons reveals a novel transcriptional effector of the hunger-suppressing effects of leptin”
Vanderbilt Diabetes Research and Training Center Seminar, Vanderbilt University Medical Center, Nashville, TN

National

- 2017 “Cell-type specific transcriptomic and epigenomic profiles from a rare population of neurons within the Arcuate Nucleus”
Research Conference, American Diabetes Association, Cambridge, MA
- 2018 “Cell-type specific transcriptomic and epigenomic profiles from a rare population of neurons within the Arcuate Nucleus”
Annual Conference, Burroughs Wellcome Fund, Research Triangle, NC
- 2021 “Integrated transcriptomic and epigenomic analysis of AgRP neurons identifies a novel mediator of leptin-induced satiety”
Annual Conference, American Diabetes Association, Obesity: From Cell to Patient, Virtual
- 2022 “AgRP neuron epigenomes across hunger states reveal that IRF3 mediates leptin's effects”
Keystone Symposium: Neuronal Control of Appetite, Fairmont Banff Springs, Canada

2022 “AgRP Neuron Epigenomes across Hunger States Reveal Novel Transcriptional Effectors of Leptin”
Simons Foundation Simons Collaboration on Plasticity and the Aging Brain conference (Cold Spring Harbor Laboratory).

International

2022 “AgRP neuron epigenomes across hunger states reveal that IRF3 mediates leptin's effects”
Keystone Symposium: Neuronal Control of Appetite, Fairmont Banff Springs, Canada
2022 AgRP Neuron Epigenomes across Hunger States Reveal Novel Transcriptional Effectors of Leptin. Gordon Conference: Hypothalamus: Unraveling the Complexity of the Hypothalamus from Single Molecules to Intricate Behaviors (Ventura, CA).
2023 AgRP Neuron Epigenomes across Hunger States Reveal Novel Transcriptional Effectors of Leptin. 3rd Neuroepigenetics & Neuroepitranscriptomics Conference (Fusion Conference, Riviera Maya, Mexico).

Report of Education of Patients and Service to the Community

No presentations below were sponsored by 3rd parties/outside entities
 Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Activities

2006-2007 Vice President, National Pan-Hellenic Council (Univ. Delaware)
, Numerous Fund Raisers, Community enrichment events, Community Outreach
2006-2008 Vice Polemarch (Vice President), Kappa Alpha Psi Fraternity, Inc. (Nu Xi Chapter, Univ. Delaware) Numerous Fund Raisers, Community enrichment events (UD Homecoming Party, 10,000 attendees), Community Outreach
2013-2014 Founding Chair, Graduate Biomedical Sciences Outreach Committee
University of Alabama at Birmingham, Budget of \$40,000, Directly supported by the UAB Graduate Biomedical Sciences Program, 2 representatives from each of the 8 GBS themes.
2020-2022 Founding Chair, Harvard Medical Black Postdoctoral Association
2020- President, Founding Chair, National Black Postdoctoral Association
2020- Committee Member, HMS Diversity and Inclusion Committee
2021- Co-Director, Nutrition and Obesity Research Center of Harvard (NORCH) Associate Member Counsel

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

Heyward, F. D. et al. Adult mice maintained on a high-fat diet exhibit object location memory deficits and reduced hippocampal SIRT1 gene expression. *Neurobiol Learn Mem* 98, 25–32 (2012).

187 citations

Ayers, L. W., Asok, A., **Heyward, F. D.**, & Rosen, J. B. (2013). Freezing to the predator odor 2,4,5 dihydro 2,5 trimethylthiazoline (TMT) is disrupted by olfactory bulb removal but not trigeminal deafferentation. *Behavioural Brain Research*, 253, 54–59.

Heyward, F. D. et al. Obesity Weighs down Memory through a Mechanism Involving the Neuroepigenetic Dysregulation of Sirt1. *J. Neurosci.* 36, 1324–1335 (2016).

78 citations

Patel S, Liu N, Piaker S, Andrade M, **Heyward FD**, Sermersheim T, Edinger N, Srinivasan H, Emont M, Westcott G, Luther J, Yan S, Kumari M, Ahmad R, Deleye Y, Tchernoff A, White P, Baselli G, Meroni M, Valenti L, Tsai L, and Rosen E (2022).. Hepatic IRF3 fuels dysglycemia in obesity through direct regulation of Ppp2r1b. *Science Translational Medicine*, Vol 14, Issue 637.

Heyward, F.D., Liu, N., Jacobs, C. *et al.* AgRP neuron cis-regulatory analysis across hunger states reveals that IRF3 mediates leptin’s acute effects. *Nat Commun* 15, 4646 (2024).

<https://doi.org/10.1038/s41467-024-48885-y>

Non-peer reviewed scholarship in print or other media:

Reviews, chapters, and editorials

Heyward, F. D. & Sweatt, J. D. DNA Methylation in Memory Formation: Emerging Insights. *Neuroscientist* 21, 475–489 (2015). **83 citations**

Professional educational materials or reports, in print or other media:

*Mukaz, D. K., ***Heyward, F. D.** & *Eche, I. J. Young researchers series #3. *Trends Cell Biol* 32, 553–556 (2022). *Co-first author.

*Beasley HK, *Clark AL, *Garner A, ***Heyward FD**, *Moore E, *Nelson RG, *Ray K, *Silvers S, *Stephens D, *Woappi Y. What does Juneteenth mean in STEM? *Cell*. 2023 Jun 8;186(12):2501-2505. doi: 10.1016/j.cell.2023.05.011. Epub 2023 Jun 8. PMID: 37295394. *Co-first author.

*Hayes, C.A., Berrios-Negron, A.L., Tamir, T., Hardeman, K.N., ***Heyward F.D.** Academic ethics of mental health: the national black postdocs framework for the addressment of support for undergraduate and graduate trainees. *Neuropsychopharmacol.* (2024). <https://doi.org/10.1038/s41386-023-01787-x> (*co-corresponding author).

Thesis:

“Obesity weighs down memory: Emerging insights into the epigenetic basis of obesity-induced memory impairment in adult mice”

Dept. of Neurobiology

University of Alabama at Birmingham

Lab of David Sweatt

Manuscripts Submitted to Preprint Servers

Heyward FD, Rosen ED. *Evidence of persistent hyperphagia following a dietary weight-loss intervention in mice*. BioRxiv, (2024).

Published Abstracts:

Reiss, J. E. Hoffman, J. E. **Heyward, FD**. Doran, M. M. Most, S. B. (2008). ERP Evidence for temporary loss of control during the attentional blink [Abstract]. *Journal of Vision*, 8(6):12, 12a, <http://journalofvision.org/8/6/12/>, doi:10.1167/8.6.12.

Heyward FD, Rosen ED, Cell Type–Specific Transcriptional and Epigenetic Profiles from a Rare Neuronal Population within the Arcuate Nucleus. [Abstract]: *Diabetes* 2018 Jul; 67(Supplement 1).

Heyward FD, Ivison R, Tsai L, Rosen ED. Epigenomic Analysis of AgRP Neurons Reveals That Leptin Induces Satiety via IRF3. [Abstract]: *Diabetes* 2020 Jun; 69(Supplement 1).

Poster Presentations (2024 and onward):

Heyward FD, Liu N, Jacobs C, Ivison R, Machado N, Uner A, Srinivasan H, Patel S, Gulko A, Sermersheim T, Tsai L, Rosen ED AGRP NEURON EPIGENOMES ACROSS HUNGER STATES REVEAL NOVEL TRANSCRIPTIONAL EFFECTORS OF LEPTIN. 2024 Network of Minority Health Research Investigators (NMRI) Annual Meeting (Bethesda, Maryland). April 2024.

Narrative Report

I am an Early-Stage Investigator and a Tenure Track Assistant Professor at UT Southwestern with a primary appointment in Internal Medicine and a secondary appointment in the Department of Neuroscience, and my lab is housed in the Dr. Joel Elmquist's Center for Hypothalamic Research.

The manuscript related to my primary postdoctoral project was published in *Nature Communications* (PMID: 38821928). In this project, I sought to appreciate transcriptional regulatory events within a small population of hypothalamic hunger-promoting AgRP neurons. To accomplish this, I generated low-input AgRP neuron-specific transcriptomic and chromatin accessibility profiles during three distinct hunger states of satiety, fasting-induced hunger, and leptin-induced hunger suppression. Cis-regulatory analysis of these integrated datasets enabled the identification of 28 putative hunger-promoting and 29 putative hunger-suppressing transcriptional regulators in AgRP neurons, 16 of which were predicted to be transcriptional effectors of leptin. Within our dataset, Interferon regulatory factor 3 (IRF3), a core component of the innate immune antiviral response pathway, emerged as a leading candidate mediator of leptin-induced hunger-suppression. Gain- and loss-of-function experiments *in vivo* confirm the role of IRF3

in mediating the acute satiety-evoking effects of leptin in AgRP neurons, while live-cell imaging *in vitro* indicate that leptin can activate neuronal IRF3 in a cell autonomous manner. Finally, we employ CUT&RUN to uncover direct transcriptional targets of IRF3 in AgRP neurons *in vivo*. Thus, our findings identify AgRP neuron-expressed IRF3 as a key transcriptional effector of the hunger-suppressing effects of leptin. These studies have piqued my interest in the role of immune regulatory factors in the etiology of obesity.

The overarching goal of my lab is to understand how neurotoxic insults caused by an obesogenic diet and aging contribute to persistent, epigenetically encoded, impairments in the properties of cell types in the brain that control appetite and body weight. We study this broad topic by employing a combination of low-input cell-type specific, and single-cell, genome-wide assessments of gene expression, epigenetic modifications, chromatin accessibility, and transcription factor DNA binding dynamics, as well as mouse genetic and epigenome engineering tools, *in vitro* and *in vivo* assessments of transcription factor activation, and animal behavioral assessments. The specific major research programs are pursuing include: a) identifying novel transcriptional pathways that regulate synaptic plasticity events controlling hunger, the development of obesity, and weight-regain, and b) understanding the transcriptional basis for alterations in synaptic plasticity underlying the anorexia of aging.