BIOGRAPHICAL SKETCH

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NAME: **Candice Blair Herber**

eRA COMMONS USER NAME (credential, e.g., agency login): **herberc**

POSITION TITLE: **Postdoctoral Researcher**

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of San Francisco	B.S.	08/2003	05/2007	Biology/Chemistry
University of California, Berkeley	Ph.D.	08/2008	05/2014	Endocrinology
University of California, San Francisco	n/a	08/2014	Present	Cellular and Molecular Physiology

A. Personal Statement

I am a postdoctoral researcher in the department of Cellular and Molecular Pharmacology at the University of California, San Francisco (UCSF) where I study neuronal sex-differences. My academic training and research experience have provided me with a background of scientific disciplines that span molecular and animal biology, cancer biology, nutritional sciences osteology and endocrinology. As an undergraduate student I had the honor of working with Dr. Dale Leitman to study how xeno- and phytoestrogen compounds modulate estrogen receptors. This undergraduate work resulted in one collaborative paper, which set the stage for my predoctoral research at UC Berkeley. As a predoctoral student I studied the modulation of estrogen receptor ERα in the presence of multiple ligands in hopes of discovering novel mechanisms that mediate the pleotropic effects of estrogen in different tissues. My predoctoral work resulted in four collaborative papers and one first-author paper (bioRxiv 607275) where I demonstrate a novel mechanism of ER action on transcriptional regulation and cell proliferation. During my graduate studies I received the outstanding graduate student instructor award and was invited to lead a focus group session at a conference for first time graduate student instructors in the art of classroom laboratory preparation and instruction. As a postdoctoral scholar I have discovered a powerful estrogen-sensitive brain-to-bone circuit that suppresses bone building in female mice. When severed, female bone metabolism shifts towards bone building. After discovering this novel sex-dependent circuit I developed three successful collaborations with distinguished labs at UCSF, UC Davis and Stanford, the Marcucio, Lane and Chan labs to assist me in dissecting the mechanisms underlying this brain dependent osteogenesis. These collaborations have been fruitful, resulting in a first author publication in Nature Communications in 2019, an invited review in Seminars in Reproductive Medicine and a paper currently in progress where we dissect changes occurring in adult skeletal stem cells after loss of ERα signaling in the hypothalamus. This exciting project has provided me the opportunity to give many short talks including a Plenary Oral at ASBMR in 2017 and the receipt of a **Young Investigator Award**. As a postdoc in the Ingraham lab I will continue my training and expand my knowledge of estrogen receptor mediated action on novel pathways in female metabolism. My long-term goal is to uncover new sex-specific mechanisms of hormone action in regulating energy homeostasis and bone metabolism to better understand and treat age and hormone-related disorders.

Selected Publications

a. **Herber, CB**. Krause, WC., Wang, L., Bayrer, JR., Li, A., Schmitz, M., Fields, A., Ford, B., Zhang, Z., Reid, MS., Nomura, DK., Nissenson, RA., Correa, SM., Ingraham, HA. 2019. Estrogen signaling in the arcuate Kiss1 neurons suppresses a sex-dependent female circuit promoting dense strong bones. Nature Commun 10(1) 163. PMCID: PMC6329772.

b. **Herber, CB**., Quirit, J., Firestone, G. and Krois, C.. 2', 3', 4'-trihydroxychalcone is an estrogen receptor ligand that modulates the effects of 17β-estradiol. BioRxivs [preprint] doi: https://doi.org/10.1101/607275.

c. **Herber, CB**., Ingraham, HA. To Make Bone or Not as told by Kisspeptin Neurons. Semin Reprod Med 37(3):147-150. PMCID: 31869843.

d. Anderson, C., Kazantis, M., Wang, J., Subramaniam, V., Quinlan, C., Ng, R., Jastroch, M., **Herber, C.**, Van, A., Henkin, A., Yun, D., Chan, K., Nie, B., Yu, A., Archambault, J., Vuong, P., Febbraio, M., Nomura, D., Carmena, J., Napoli, J., Brand, M., Stahl, A. 2014. CD-36 mediated CoQ uptake is re quired for brown adipose tissue function and *UCP1* expression. Cell Reports 10(4) 505-15. PMCID: 25620701.

B. Positions and Honors

Positions and Employment

2005-2007 Research Technician with Dr. Dale Leitman,
University of California, San Francisco, Department of Reproductive Sciences

2007-2008 Research Consultant
BioNovo, Inc., Emeryville, California

2008-2014 Graduate Student with Dr. Dale Leitman and Dr. Gary Firestone
University of California, Berkeley, Department of Endocrinology
Thesis "2', 3', 4'-trihydroxychalcone is an Estrogen Receptor Alpha Coagonist"

2014-Current Postdoctoral Fellow with Dr. Holly A. Ingraham
University of California, San Francisco, Department of Molecular and Cellular Pharmacology

Other Experiences and Professional Memberships

2009- Member of the Endocrinology Society

2010-2014 Graduate Student Instructor for Nutritional Science and Toxicology Laboratories, UC Berkeley

2013- Invited Instructor for First Time Graduate Student Seminar on Teaching, UC Berkeley

2014- Member of the American Heart Association

2014- Member of the Organization for the Study of Sex Differences

2016-2019 Lecturer for the Department of Medicine School of Pharmacy and Dentistry
Topics: 1) Reproductive Endocrinology and 2) The Nephron

2017- Member of the Association for the Study of Bone and Mineral Research

2018- P30 CCMBM Junior Investigator

2020- Member of the International Society for Stem Cell Research

Honors and Awards

2013 Award for Outstanding Graduate Student Instructor, University of California, Berkeley

2017 **ASBMR Young Investigator Award**

2019 Spring Semester Dean's Apple Award for Outstanding Teaching (UCSF)

2019 Tecan's Spotlight on Science

2019 Winter Semester Dean's Apple Award for Outstanding Teaching (UCSF)

Invited Lectures

a. **Herber, C.B.**, Kajimura, S., Correa, S., and H. A. Ingraham. In vivo imaging of a new highly sensitive ThermoMouse (*Ucp1-Luc*) line reveals marked sex-differences in BAT thermogenesis. Presented at Keystone Symposia 2016.

b. **Herber, C.B.**, Kajimura, S., Correa, S., and H. A. Ingraham. A new highly sensitive ThermoMouse (*Ucp1-Luc*) line reveals marked sex-differences in BAT thermogenesis. Presented at Pediatric Endocrine Research in Progress Seminar Series. 2016.

c. **Herber, C.B**., Krause, W., Correa, S., and H.A. Ingraham. Disrupting Estrogen Signaling in the Arcuate Creates Dense Bones in Female Mice. Presented at UCSF Diabetes Center Seminar, 2017.

d. **Herber, C.B**., Krause, W., Correa, S., and H.A. Ingraham. Deleting Estrogen Signaling in the MBH Creates Dense Strong Bones in Female Mice. Presented at UCSF Pediatric Endocrinology Research In Progressf Seminar, 2017.

e. **Herber, C.B**., Krause, W., Correa, S., and H.A. Ingraham. Disrupting Estrogen Signaling in the Arcuate Nucleus Creates Ageless Bones in Female Mice. Presented at ASBMR, 2017.

f. **Herber, C.B**., Krause, W., Correa, S., and H.A. Ingraham. Disrupting Estrogen Signaling in the Arcuate Creates Ageless Bones in Female Mice. Presented at UCSF-VA CCMBM Seminar Series, 2018.

g. **Herber, C.B**., Ambrosi, T., Ventura, P., Villeda, S., Chan, C. and Ingraham HA. A Brain Dependent Osteogenic Factor Dramatically Enhances the Capacity of Skeletal Stem Cells to Form Bone. Presented at ASBMR, 2019.

C. Selected Contributions to Science

1. Graduate Career: My graduate research contributions focused on developing novel ligands for treating women suffering from symptoms associated with menopause without increasing cancer risk. I successfully found a novel chalcone compound, which modulates the effects of estrogen on the ERα receptor. My findings are mentioned in the review below and have been submitted for publication.

a. **Herber, CB**., Quirit, J., Firestone, G., Krois, C. 2', 3', 4'-trihydroxychalcone is an estrogen receptor ligand that modulates the effects of 17β-estradiol. BioRxivs [preprint] doi: https://doi.org/10.1101/607275.

b. Krois CR, Vuckovic MG, Huang P, Zaversnik C, Liu CS, Gibson CE, Wheeler MR, Obrochta KM, Min JH, **Herber CB**, Thompson AC, Shah ID, Gordon SP, Hellerstein MK, Napoli JL. 2019. RDH1 suppresses adiposity by promoting brown adipose adaptation to fasting and re-feeding. Cell Mol Life Sci. PMID: 30788515.

c. Levy, N., Tatomer, D., **Herber, C.**, Zhao, X., Tang, H., Sargeant, T., Ball, L., Summers, J., Speed, T., Leitman, D. 2008. Differential regulation of native estrogen receptor- regulatory elements by estradiol, tamoxifen and raloxifene. Mol Endo 22(2), 287-303. PMCID: PMC2234590.

d. Paruthiyil, S., Cvoro, A., Zhao, X., Wu, Z., Sui, Y., Staub, R., Baggett, S., **Herber, C.**, Griffin, C., Tagliaferri, M., Harris, H., Cohen, I., Bjeldanes, L., Speed, T., Schaufele, F., Leitman, D. 2009. Drug and cell type specific regulation of genes with different classes of estrogen receptor beta selective agonists. PLoS One 4(7), 6271. PMCID: PMC2707612

2. Postdoctoral Career: As a postdoc I have discovered a novel brain-to-bone pathway which functions to inhibit bone building in female mice. Interestingly, estrogen-sensitive neurons in the hypothalamus inhibit, instead of promote, bone building in female mice. These findings have been published in *Nature Communications* and have led to a new target for combating age and hormone-related bone loss.

a. **Herber, CB**. Krause, WC., Wang, L., Bayrer, JR., Li, A., Schmitz, M., Fields, A., Ford, B., Zhang, Z., Reid, MS., Nomura, DK., Nissenson, RA., Correa, SM., Ingraham, HA. 2019. Estrogen signaling in the arcuate Kiss1 neurons suppresses a sex-dependent female circuit promoting dense strong bones. Nature Commun 10(1) 163. PMCID: PMC6329772.

b. **Herber, CB**., Ingraham, HA. To Make Bone or Not as told by Kisspeptin Neurons. Semin in Repro Med. 37(3):147-150. PMID: 31869843.

c. In preparation:

d. **Herber, C.B**., **Ambrosi, T**., Chan CK., and H. A. Ingraham. A Brain-Dependent Osteogenic Factor Primes Skeletal Stem Cells Promoting Bone Building. In preparation for submission to *Nature Medicine.*

e. **Herber, C.B.,** Krause, WC., Ingraham, HA. Hypothalamic Estrogen Signaling as a Nutrient Allocator. In preparation for submission to *Annual Reviews in Physiology*.

D. Research Support

Completed Research Support

NIH F32 DK107115-01A1 PI (Herber, CB) 7/1/2018- 6/30/2019
"Molecular Mechanisms of VMH-Specific Activation of Brown Adipose Tissue"
The goal of this study is to understand how estrogen sensitive neurons in the VMH controls sex-dependent thermogenesis.
Role: PI

CCMBM Core Voucher Award PI (Herber, CB) 2/1/2019- 7/1/2019

This award provides $5000 dollars for use at the Skeletal Biology and Biomechanics Core over a 6 month period.
Role: PI

16POST29870011 PI (Herber, CB) 7/1/2016- 6/30/2017
American Heart Association Postdoctoral Fellowship Award
“Molecular Mechanisms of VMH-Specific Activation of Brown Adipose Tissue”
The goal of this study is to understand how estrogen sensitive neurons in the VMH controls sex-dependent thermogenesis.
Role: PI

5T32DK007161-41 PI (Stephen Gitelman) 7/1/2015- 6/30/2016
Department of Health and Human Public Health Service Ruth L. Kirschstein National Research Service Award
Role: Trainee

Ongoing Research Support

NIH 1K01AG065916-01A1 PI (Herber, CB) 4/1/2020- 3/31/2025
‘‘Unraveling Mechanisms Driving Female Specific Osteogenesis after Disrupting a Brain-to-Bone Circuit”
The goal of this study is to understand how the neuronal sex differences contribute to skeletal homeostasis.
Role: PI