Approved by the Regents
May 17, 2018

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF MOLECULAR AND INTEGRATIVE PHYSIOLOGY
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Carol F. Elias, Ph.D., associate professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and associate professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School, is recommended for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School.

Academic Degrees:

Ph.D.	1997	University of Sao Paulo, Brazil
M.S.	1994	University of Sao Paulo, Brazil
B.S.	1991	University of Campinas, Brazil

Professional Record:

2012-present	Associate Professor of Molecular and Integrative Physiology, University of Michigan
2012-present	Associate Professor of Obstetrics and Gynecology, University of Michigan
2012-2012	Associate Professor of Internal Medicine, UT Southwestern Medical Center, Dallas, TX
2008-2012	Assistant Professor of Internal Medicine, UT Southwestern Medical Center, Dallas, TX
2006-2007	Visiting Associate Professor, Internal Medicine, UT Southwestern Medical Center, Dallas, TX
2004-2009	Associate Professor of Anatomy, Institute of Biomedical Sciences, University of São Paulo, Brazil
1998-2004	Assistant Professor of Anatomy, Institute of Biomedical Sciences, University of São Paulo, Brazil

Summary of Evaluation:

Teaching: Since joining the University of Michigan in 2012, Dr. Elias has taught medical, graduate and undergraduate classes, including an ethics in research course and a quantitative physiology course. In 2014, she became the director for the Mammalian Reproductive Physiology course. About 40% of her time is spent mentoring students and trainees in her lab. She has supervised numerous trainees and visiting scholars – many of whom have moved on to be accepted into medical school or are establishing their own independent research programs. A former clinical fellow in her lab was recently hired by the University of Michigan as an assistant professor in the Department of Obstetrics and Gynecology. In 2016, she received the Clinical Research Fellowship Mentor Award from Pfizer, Inc. for her mentorship in endocrine research.

Research: Dr. Elias' research focuses on understanding the brain circuitry associated with the metabolic control of the reproductive function. Using systems neuroscience and molecular mapping,

her research team is defining the specific hypothalamic nuclei responsive to leptin and other associated neural circuitry. Their studies have opened the field to a new era of investigation in neuroendocrinology. In addition, they are seeking to determine the molecular pathways associated with the metabolic control of the reproductive function. Dr. Elias is an excellent collaborator and is currently working with several outstanding colleagues at the University of Michigan; she is leading the establishment of a center for translational research in reproduction and infertility (to be funded under a NIH P50 Award). Dr. Elias' research has been continuously funded by the NIH and she has been an active participant in two (P30) center grants. She has published over 30 papers since her last appointment. Her work is highly cited and has appeared in premier journals including *Endocrinology* and the *American Journal of Physiology*. She speaks frequently at national and international high-profile neuroendocrinology and reproductive conferences and is truly a world-class scientist in her field.

Recent and Significant Publications:

Frazao R, Lemko HD, Silva RP, Ratra DV, Lee CE, Williams KW, Zigman JM, Elias CF: Estradiol modulates Kiss1 neuronal response to Ghrelin. *Am J Physiology–Endocrinology & Metabolism* 306:E606-614, 2014.

Borges BC, Garcia-Galiano D, Elias LLK, Elias CF: PI3K p110β subunit in leptin receptor expressing cells is required for the acute hypophagia induced by endotoxemia. *Molecular Metabolism* 5:379-391, 2016.

Torsoni MA, Borges BC, Cote JL, Allen SJ, Mahany E, Garcia-Galiano D, Elias CF: AMPKα2 in Kiss1 neurons is required for the reproductive adaptations to acute metabolic challenges in adult female mice. *Endocrinology* 157:4803-4816, 2016.

Borges BC, Garcia-Galiano D, Silveira Cruz-Machado S, Han X, Gavrilina GB, Saunders TL, Auchus RJ, Hammoud S, Smith GD, Elias CF: Obesity-induced infertility in male mice is associated with disruption of Crisp4 expression and sperm fertilization capacity. *Endocrinology* 158:2930-294, 2017.

Mohsen Z, Sim H, Garcia-Galiano D, Han X, Bellefontaine N, Saunders TL, Elias CF: Sexually dimorphic distribution of Prokr2 neurons revealed by the Prokr2-Cre mouse model. *Brain Struct Funct.* DOI: 10.1007/s00429-017-1456-5, 2017.

Service: Dr. Elias has served on the editorial boards of *Endocrinology*, the *American Journal of Physiology*, and the *Brazilian Journal of Medical Biological Science*. In 2016, she served as a guest editor for *Molecular and Cellular Endocrinology*'s special issue on the hypothalamus. She is also an ad hoc reviewer for over 30 scientific journals, and holds memberships in several professional national and international societies. At the institutional level, she served on the Molecular and Integrative Physiology (MIP) Graduate Program Committee (2014-2017) and is currently a member of MIP's Chair Advisory Committee. She was recently appointed as the co-director of the Reproductive Sciences Program, and Diversity, Equity and Inclusion Faculty Representative for MIP.

External Reviewers:

Reviewer A: "I estimate that Dr. Elias is within the top 5% of her peer group in her research area. She is widely respected in the reproductive neuroendocrinology field and is often invited to present her data at international conferences."

Reviewer B: "In terms of publications, several are truly landmark notably her Kisspeptin mapping studies, the leptin/neuronal proliferation studies, and her PROKR2 studies are all classics in the field widely quoted by others....we always turn first to Dr. Elias' animal work to guide hour crafting of hypotheses and constructing human experimentation in our disease models. In this regard, she is clearly one of THE leaders in this field that are looked to by others as guides to the future and whose studies are always reliable and reproducible."

Reviewer C: "Overall, the work that she has led is tightly focused, but has incorporated new insights from the intersection of reproductive and metabolic control. It is of the highest quality and has been very influential in the research community. She is among the top 2 or 3 investigators nationally and internationally working in this area....In addition, she has an extraordinary record of supporting the scientific development of trainees, both her own and others for whom she has served on thesis advisory or exam committees. She also has an extremely impressive record of service to the scientific community through grant reviews and service on editorial boards."

Reviewer D: "Her training activities are extensive and she appears to be very much in demand as a mentor and committee member for both graduate and undergraduate students....On the national level, she has had extensive experience as a reviewer of manuscripts and grants, including service on NIH study sections."

Reviewer E: "Dr. Elias has a solid reputation in the field of Neuroendocrinology, with a clearly recognized body of contributions in fields of high impact, such as brain effects of leptin in terms of control of reproduction, and interplay of leptin and kisspeptin neurons. Her seniority is attested by numerous invitations to present her work in international meetings and her track record of publications, with papers as senior author in some top journals in the field of Endocrinology, Neurosciences and Biomedicine."

Summary of Recommendation:

Dr. Elias is a highly esteemed and productive member of the Medical School. Her scholarly contributions as a researcher, service to her departments and our institution, and her vast contributions in mentoring make her deserving of promotion. I am pleased to recommend Carol F. Elias, Ph.D. for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School.

Marschall S. Runge, M.D., Ph.D.
Executive Vice President for Medical Affairs
Dean, Medical School

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