



KATARINA T. BORER LECTURESHIP IN EXERCISE ENDOCRINOLOGY & METABOLISM

ESTROGEN RECEPTOR ALPHA (ESR1) KEEPS MITOCHONDRIA IN SHAPE— STRONG ENOUGH FOR A MAN, BUT MADE FOR A WOMAN



with **ANDREA HEVENER, PHD**

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Friday, October 21

Lecture: 3:30-4:30pm • SKB 2600

Reception: 4:30-5:30pm • SKB 4th Floor

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Abstract: Sex differences in metabolic disease risk and incidence are well-described. Females show a reduced incidence of metabolic-related disease compared with males. However, this female-biased protection is lost during the menopausal transition. To gain mechanistic insight into the genetic drivers underlying the impact of biological sex on metabolism, we have interrogated multi-omic analyses from numerous human observational trials, as well as a novel 100-strain mouse panel. We find that skeletal muscle expression of *ESR1* (encodes ER α) is positively correlated with insulin sensitivity, negatively correlated with adiposity, and reduced in the context of metabolic syndrome in human subjects. Because differences in metabolism between the sexes are often attributed to reproductive hormones, and because skeletal muscle is a primary tissue responsible for insulin-stimulated glucose disposal, we interrogated the impact of skeletal muscle-specific *Esr1* loss and gain of expression on insulin sensitivity and metabolic health in the context of nutrient and physical activity challenge. The goal of the 2022 Borer Lecture is to provide a general overview of sex as biological variable in the control metabolism and advance mechanistic insight into the critical role of ER α in the maintenance of metabolic health. In aggregate, our studies provide improved understanding of the pathobiology of metabolic disease, and lay the important foundation for enhanced therapeutic targeting of metabolism and insulin sensitivity to prevent or reverse metabolic-related disorders.

We are indebted to Professor Emerita Katarina Borer and Dr. Paul Wenger for their generous gift that has made this lectureship possible.

Please [forward this email](#) to other faculty, staff, & students who may be interested!