THE GRADUATE COLLEGE OF THE
UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER

ANNOUNCES THE FINAL EXAMINATION OF

Rabab (Ruby) Sharif, MD, MSc

FOR THE DEFENSE OF THE DOCTOR OF PHILOSOPHY DEGREE

GRADUATE COLLEGE
Department of Cell Biology

Friday, April 26, 2019 | 10:00 am
Biomedical Research Center (BRC), Room 109

Potential Role of Prolactin-Induced Protein as a Disease Biomarker and the Effect of Corneal Cross-Linking on Keratoconus Microenvironment

COMMITTEE IN CHARGE: Dimitrios Karamichos, PhD; H. Anne Pereira, PhD
Randle M. Gallucci, PhD, Jody A. Summers, PhD, and Michelle C. Callegan, PhD

ABSTRACT: Keratoconus (KC) is a multifactorial, bilateral corneal dystrophy that leads to loss of visual acuity through ectasia, corneal bulging and scarring. KC is currently the most common indication for corneal transplantation in the Western countries, affecting approximately 1:400 to 1:2000 people worldwide, including both males and females. KC usually starts at puberty and progresses until the third or fourth decade of life due to unknown etiology. The unknown etiopathology and the lack of experimental KC models, hinders our ability to manage and treat the disease. Current treatment options for patients with early-stage KC include the use of spectacles and contact lenses. However, as KC progresses to more severe stages, with corneal scarring and severe thinning, corneal transplantation by penetrating keratoplasty (PK) becomes unavoidable. Unfortunately, PK carries significant risks and side effects. Recently, collagen cross-linking (CXL) became the newest modality for stopping KC progression for a subset of KC patients. Effectiveness of CXL is still under evaluation, both clinically and experimentally.

Our studies have led to the hypothesis that KC is a systemic disease where sex hormones play a fundamental role in its onset. During the course of this thesis we discovered, what we believe to be, the first-ever KC biomarker named Prolactin-induced protein (PIP). This dissertation focuses on unravelling the role of PIP in KC and highlights its interplay with sex hormones.

Furthermore, this thesis unravels the molecular effects of CXL on the human corneal microenvironment, in an attempt to broaden the use of CXL to all KC patients. This work provides intriguing insights in the underlying KC pathophysiology and paves the way towards a dynamic, powerful, and non-invasive approach towards KC screening, diagnosis and prognosis.