

ABSTRACT

Every year there are an increasingly large number of new cases of end-stage-renal-disease (ESRD) in the United States, with 124,111 patients progressing to ESRD in 2015 alone. Of these cases, 30% are attributable to hypertension. Kidney transplantation is the best treatment for ESRD, however, its use is limited by the recipient's immune response against the transplant. The use of advanced immunosuppression has allowed for significant improvement in short to medium term transplant survival, however, the long-term transplant survival remains poor due to chronic rejection. The median transplant survival is only 10.9 years from deceased donors and 14.8 years from living donors. Chronic rejection is characterized by the gradual development of fibrosis and nephropathy which can be identified as early as 3 months post-transplant and in 50% of biopsies 1 year post-transplant. A common comorbidity to graft rejection is hypertension, as 70-83% of recipients are hypertensive or become hypertensive post-transplant. Interestingly, hypertension also leads to the development of fibrosis and nephropathy. We sought to develop a model of chronic renal allograft rejection in the rat, in which the interplay hypertension and chronic allograft rejection could be studied. We hypothesized that with the correct tacrolimus regimen, a model of chronic renal allograft rejection can be developed in the rat that includes a hypertensive salt-sensitive Dahl-S donor.

DISSERTATION COMMITTEE

Stanislaw Stepkowski, D.V.M., D. Sc., Ph.D.,
Major Mentor

Steven T. Haller, Ph.D

Kevin Pan, M.D., Ph.D.

R. Mark Wooten PhD, Graduate School Representative

The University of Toledo College of
Medicine

Medical Microbiology &
Immunology (MMI) Track

Department of Medical Microbiology
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THE UNIVERSITY OF
TOLEDO
1872

THESIS PRESENTATION

**Joshua
Breidenbach**

July 30, 2018

“The Development of
a Novel Model for
Chronic Renal
Allograft Rejection”

M.S. in
Biomedical Sciences

CONFERENCES

2018 University of Toledo Graduate Research Forum—poster presentation

2018 American Transplant Congress—invited to give an oral presentation

APPOINTMENTS

Medical Microbiology and Immunology Track Representative for the 2017-2018 College of Biomedical Sciences Council

Vice President for the 2018-2019 College of Biomedical Sciences Council

APPOINTMENTS (NON-SCIENTIFIC)

Founder and President of the University of Toledo Climbing Club (est. 2016)

Undergraduate Representative for the University of Toledo Student Government

FUTURE PLANS

Joshua plans to continue his education in the Biomedical Sciences field in Dr. Steven T. Haller's lab, where he will study the effects of Lake Erie-derived microcystin-LR via the inhalation route.