

# Conrrad Makea Rupe Nicholls

NIH NRSA F31 Pre-Doctoral Research Fellow at Purdue University

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## Curriculum Vitae

### Education:

#### Formal Degrees:

- **Doctor of Philosophy – Virology**  
Purdue University (2016-Present)
- **Master of Public Health – Environmental Health**  
Purdue University (2017-Present)
- **Bachelor of Science – Biology | Men's Football**  
Indiana State University | Student Athlete (2011-2016)

#### Specialization Certificates:

- **Genomic Data Science**  
Johns Hopkins University | Coursera (2019)

### Research Experience:

(Graduate – June 2016-Present)

#### Identification of Flavivirus Nucleocapsid Core-Envelope Glycoprotein Interactions

Conrrad Nicholls, Dr. Richard J. Kuhn

Department of Biological Sciences, Purdue University, West Lafayette, IN 47904

Previous structural data has displayed possible interactions between the nucleocapsid core and envelope glycoproteins of Zika virus (ZIKV). These yet untested interactions have the potential to be exploited as novel drug targets that could inhibit the proliferation of ZIKV and reveal new insights into flavivirus assembly and maturation. To this end, we are investigating the observed nucleocapsid core-envelope glycoprotein interactions via several methods, including protein mutagenesis, pull-down assays, nanodisc reconstitution, and electron microscopy. In sum, due to the high similarity of ZIKV to other flaviviruses (such as the dengue, West Nile, and yellow fever viruses) the techniques, results and mechanisms identified in this study have the potential to be applied to other flaviviral infections.

(Undergraduate – May 2015-May 2016)

#### Effects of Prophages on Capsule Regulation in *Streptococcus pyogenes*

Conrrad Nicholls<sup>1</sup>, Andrew Kump<sup>1</sup>, Rusty Gonser<sup>2</sup>, Kyu Hong Cho<sup>2</sup>

Department of Biology, Indiana State University

Using an invasive clinical strain from the Center for Disease Control and Prevention (*S. pyogenes* 2009209436), spontaneous mutation was encouraged by passaging. Capsule-overproducing mutants were identified, isolated, and their genomes extracted and purified, leading to the sequencing and annotation of the bacterial genomes for comparison and prophage identification.

### Publications:

(Graduate)

#### Structure Guided Paradigm Shifts in Flavivirus Assembly and Maturation Mechanisms

Conrrad Nicholls<sup>a</sup>, Madhumati Sevvana<sup>a</sup>, Richard J. Kuhn<sup>a,b</sup>

<sup>a</sup>Department of Biological Sciences, Purdue University, West Lafayette, IN, United States

<sup>b</sup>Purdue Institute of Inflammation, Immunology and Infectious Disease, Purdue University, West Lafayette, IN, United States

PMCID: PMC7510438

(Undergraduate)

#### Draft Genome Sequence of *Streptococcus pyogenes* Strain M3KCL.

Conrrad Nicholls, Andrew Kump, Sarah Ford, Rusty Gonser, Kyu Hong Cho

Department of Biology, Indiana State University

PMCID: PMC5638285

### Presentations:

#### Identification of Flavivirus Nucleocapsid Core-Envelope Glycoprotein Interactions

Conrrad Nicholls, Dr. Richard J. Kuhn

Department of Biological Sciences, Purdue University

##### Oral Presentation given at:

- American Society for Virology – Virtual Symposium – July 19-23<sup>rd</sup>, 2021
- World Society for Virology – Virtual Symposium – June 16-18<sup>th</sup>, 2021

##### Poster Presentation given at:

- Purdue Office of Interdisciplinary Graduate Programs Spring Reception – May 3-7<sup>th</sup>, 2021
- American Society for Virology – University of Minnesota – July 20-24<sup>th</sup>, 2019
- Purdue Office of Interdisciplinary Graduate Programs Spring Reception – May 1<sup>st</sup>, 2019

## Teaching Experience (Graduate Teaching Assistant):

### Biology 328 Lab – Principles of Physiology: January – May, 2019, 2020, 2021

- Provided students with an introduction to physiology with an emphasis on the cellular mechanisms that underlie anatomical and physiological adaptations used by animals to survive in various ecosystems. Such understanding was produced through classroom experimentation.

### Biology 442 – Animal Physiology: August – October, 2018, 2019, 2020

- Demonstrated surgical techniques on live (sedated) rodents to facilitate student's understanding of living physiological processes, anatomical structures, and chemical sedation/response within a mammalian system.

## Campus Involvement:

(Graduate)

- Co-Chair: TA Professional Development Workshop Series
- Planning Committee Member: Purdue HGBG Symposium
- Science Day Co-Chair: PULSe Science in Schools
- President: Polynesian Cultural Club of Purdue
- Member: Native American Educational and Cultural Center
- SROP Coordinator/AGEP Bridge Student

(Undergraduate)

- Defensive Captain of the ISU Football team
- Member of the ISU Football Leadership Committee
- Member of the 2015 SURE program

## Honors & Awards:

- Recipient of an NIH NRSA F31 Pre-Doctoral Fellowship – Fall 2020
- Recipient of an NIH NRSA T32 Training Grant – Summer 2020
- Recipient of the Purdue Interdisciplinary Graduate Travel Grant – Fall 2019
- Recipient of the American Society for Virology Student Travel Award – Spring 2019
- Recipient of the Purdue Doctoral Fellowship – Fall 2016
- Recipient of the Purdue Lynn Fellowship – Summer 2016
- Recipient of Indiana State Football's Team Leadership Award – Spring 2016
- Named to the Missouri Valley Football Conference Academic Honor Roll from 2012 - 2016
- Recipient of the Commissioner's Academic Excellence Award – Fall 2013
- Named ISU Football Defensive Captain as a Sophomore – Fall 2012
- Recipient of a Full-Ride Scholarship – Indiana State University Football – Spring 2011

## Community Service:

### **Boy Scouts of America (2012-2016)**

- Obtained rank of Eagle Scout (2007) and offer personal experience for the benefit of younger scouts
- Volunteered as a scout leader for local troop in Terre Haute, IN

### **Special Olympics**

- Organized participants for the Terre Haute, IN area under the direction of Happiness Bag Inc. (2013-2014)
- Volunteered at the Indiana Special Olympics as a weightlifting coach and judge (2013-2014)

### **Boys and Girls Club (2012-2016)**

- Helped take care of the Boys and Girls Club facility and grounds with attention to detail
- Coached children 3 days a week in specific sports and emphasized the importance of fitness

## Related Coursework:

(Graduate)

- Macromolecules
- Statistical Methods for Biology
- Membrane Protein Structural Biology
- Immunobiology
- Scientific Communications
- Grant Writing
- Emergency Management for Agriculture Operations
- Biochemical Toxicology
- Fundamentals of Epidemiology
- Advanced Topics in Exposure Assessment
- Occupational Safety and Ergonomics
- Public Health Administration

## References:

### **1) Richard J. Kuhn, Ph.D.**

Trent and Judith Anderson Distinguished  
Professor in Science  
Director, Purdue Institute for Inflammation,  
Immunology and Infectious Disease  
Purdue University  
[kuhnr@purdue.edu](mailto:kuhnr@purdue.edu)

### **2) Douglas J. LaCount, Ph.D.**

Associate Professor, Medicinal Chemistry  
and Molecular Pharmacology  
Purdue University  
[dlacount@purdue.edu](mailto:dlacount@purdue.edu)

### **3) Robert Stahelin, Ph.D.**

Associate Professor, Medicinal Chemistry  
and Molecular Pharmacology  
Purdue University  
[rstaheli@purdue.edu](mailto:rstaheli@purdue.edu)