

Curriculum Vitae

Jennifer Lynn Edwards

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US Citizen

CONTACT INFORMATION

The Abigail Wexner Research Institute at Nationwide Children's Hospital
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CURRENT APPOINTMENTS

Principal Investigator

2004-present

Center for Microbial Pathogenesis, The Abigail Wexner Research Institute at Nationwide Children's Hospital (formerly the Research Institute at Nationwide Children's Hospital)

Academic Appointments - The Ohio State University

2012-present

Associate Professor, Department of Microbial Infection and Immunity, Courtesy Appointment

2010-present

Associate Professor, Department of Pediatrics, College of Medicine

Associate Professor, Biomedical Sciences Graduate Program (previously the Integrated Biomedical Graduate Program; IBGP), College of Medicine

Associate Professor, Medical Scientist Training Program, College of Medicine

Professional Affiliations

2020-

Sigma Xi Scientific Research Honor Society

2017-present

Infectious Diseases Institute, The Ohio State University

2013-present

American Sexually Transmitted Diseases Association
International Union Against Sexually Transmitted Infections

2011-present

Ohio Branch of the American Society for Microbiology

2004-2017

Center for Microbial Interface Biology, The Ohio State University

1999-2005

Microscopy Society of America

Iowa Microscopy Society

1995-present

American Society for Microbiology

EDUCATION AND TRAINING

Degrees Awarded

2002

Ph.D. in Microbiology, The University of Iowa, Iowa City, IA 52242

Mentor: Dr. Michael A. Apicella

Thesis: "Complement Opsonization and Direct Adherence of *Neisseria gonorrhoeae* to Complement Receptor Type 3 Mediates Cervical Cell Invasion"

* *Deans' Distinguished Dissertation Award*

1997

M.A. in Biology, Bemidji State University, Bemidji, MN 56661

Mentor: Dr. Patrick Guilfoile (GPA: 4.00/4.00)

Thesis: "The Utility of Thiostrepton for Genetic Analysis of Mycobacteria"

1996

B.S. in Biology, Bemidji State University, Bemidji, MN 56661

Mentor: Dr. Patrick Guilfoile (GPA: 3.87/4.00; *magna cum laude*)

Thesis: "Pitfalls of using MacConkey agar for the identification of α -complementing *Escherichia coli* recombinants"

Fellowships Awarded

2003-2004

Post-doctorate Research Fellowship, Mechanisms of Parasitism Training Program, the University of Iowa, College of Medicine; National Institutes of Health T32AI07511-07

2002-2003

Post-doctorate Research Fellowship, Infectious Diseases Training Program, the University of Iowa, Department of Internal Medicine; National Institutes of Health T32AI07343-14

2000-2002

Pre-doctorate Research Fellowship, Graduate Research Training Program, the University of Iowa, Department of Internal Medicine; National Institutes of Health 5T32HL07638

Previous Positions and Experience

2005-2010

Assistant Professor, Integrated Biomedical Graduate Program, College of Medicine, The Ohio State University, Columbus, OH

Assistant Professor, Medical Scientist Training Program, College of Medicine, The Ohio State University, Columbus, OH

2004-2010

Assistant Professor, Department of Pediatrics, College of Medicine, The Ohio State University, Columbus, OH

- 2002-2004 *Post-doctoral Fellow*, Department of Microbiology, College of Medicine, University of Iowa, Iowa City, IA
- 1997-2002 *Graduate Research Assistant*, Department of Microbiology, College of Medicine, University of Iowa, Iowa City, IA
- 1996-1997 *Graduate Teaching Assistant*, Department of Biology, Bemidji State University, Bemidji, MN
- Research Assistant*, Department of Biology, Bemidji State University, Bemidji, MN
- 1996 *Research Technician*, NASA Biological Research Projects, Brookhaven National Laboratory, NY; Mentor: Dr. A. Lindgren
- 1994-1996 *Laboratory Technician*, Bemidji State University, Bemidji, MN

TEACHING AND MENTORING

Formal Teaching

- 2014-present *Co-instructor (Team instructed course)*, Molecular Biology of Bacterial Pathogens (Microbiol:7724/BSGP:7240), Biomedical Sciences Graduate Program, The Ohio State University.
- 2013-2017 *Co-instructor (Team instructed course)*, Problem Solving in Biomedical Sciences (BSGP:7040, previously IBGP:7040), Biomedical Sciences Graduate Program, The Ohio State University
- 2013 *Co-instructor (Team instructed course)*, Select Topics in Advanced Immunology (MVIMG:8010), Department of Molecular Virology, Immunology, and Medical Genetics, The Ohio State University
- 2011 *Lecturer*, Selected Topics in Microbial Pathogenesis (IBGP:740), Integrated Biomedical Science Graduate Program, The Ohio State University
- 2008 *Instructor*, Presentation Skills for Biomedical Researchers (IBGP:780), Integrated Biomedical Science Graduate Program, The Ohio State University (*Student Nominated Instructor*)
- 2007-2011 *Co-instructor (Team instructed course)*, Molecular Biology of Bacterial Pathogens (Microbiol:724), Department of Microbiology, The Ohio State University.
- 2007 *Lecturer*, Seminars for Graduate Students (IBGP:797), Integrated Biomedical Science Graduate Program, The Ohio State University
- 2005-present *Lecturer*, Host-Pathogen Interactions (IBGP:795), Integrated Biomedical Science Graduate Program, The Ohio State University

- 2005 *Course leader, Host-Microbial Interactions (IBGP:851), Integrated Biomedical Science Graduate Program, The Ohio State University (Student Nominated Instructor)*
- 2004 *Lecturer, Pathogenic Bacteriology (Microbiol. 061:259), The University of Iowa. Subjects covered: Pathogenic mechanisms of *Haemophilus spp.* and *Neisseria spp.**
- Lecturer, Perspectives in Biotechnology (Microbiol. 061:275), The University of Iowa. Subject covered: difficulties associated with the development of vaccines against highly variable organisms*
- 2002-2003 *Supervisor and Discussion Leader, Integrated Topics in Infectious Disease (Microbiol. 061-217), The University of Iowa*
- 1999-2001 *Graduate Assistant, Department of Microbiology, The University of Iowa: Pathogenic Bacteriology (Microbiol. 061:159), Principles of Infectious Disease (Microbiol. 061-103), Microbiology for Nursing (Microbiol. 061:164)*

Teaching Related Experience

- 2020 *Mentor, Biomedical Writing Workshop, The Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH*
- 2012-present *Presenter/Participant, Infectious Diseases Consortium, The Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH*
- 2011-2014 *Presenter/Participant, Biofilms in Human Disease Group, The Center for Microbial Interface Biology, The Ohio State University, Columbus, OH*
- 2007-2015 *Initiator/Organizer, Presenter/Participant, Bench to Outcomes Seminar Series (BOSS), The Research Institute at Nationwide Children's Hospital, Columbus, OH*
- 2007-2008 *Discussion Leader/Supervisor, Center for Microbial Pathogenesis Journal Club, The Research Institute at Nationwide Children's Hospital, Columbus, OH*
- 2006-present *Participant, Center for Microbial Pathogenesis Journal Club, The Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH*
- 2005-present *Presenter/Participant, Center for Microbial Pathogenesis Work in Progress Meeting, The Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH*

1994-1996 *Tutor*, Biology and Genetics; The Department of Biology, Bemidji State University, Bemidji, MN

Curriculum Development

Bench to Outcomes Seminar Series (BOSS):

The BOSS is a monthly forum for all faculty, staff, and trainees of (The Abigail Wexner Research Institute at) Nationwide Children's Hospital and The Ohio State University. BOSS provides a unique forum by which to foster collaboration in that the seminar comprises a joint format presentation with an emphasis on stimulating thoughtful discussion among, and between, clinical and basic scientists. A case study, or a problem of clinical significance, is presented. This is followed by a presentation of the basic science related to that case or problem and an extended period of open discussion. I conceived of, and proposed, the idea for BOSS; however, the seminar was organized through the joint efforts of the BOSS organizing committee. Faculty peer evaluations, presentation evaluations, and continuing medical education (CME) credit are provided. The BOSS has been very well received. In this regard, it has served as a model for numerous, similarly formatted, seminar series across Nationwide Children's Hospital and The Ohio State University.

Mentorship

Post-doctorate Research Scientists:

2018-present *R. L. Hardison*, Ph.D. awarded from the Ohio State University, OH

2013-2014 *J. A. Gawthorne*, Ph.D. awarded from the University of Queensland, St. Lucia; Brisbane, Australia
Post-doctorate at the University of Glasgow; Glasgow, Scotland
Post-doctorate at the Institut Pasteur; Paris, France

2010-2012 *E. K. Butler*, Ph.D. awarded from the University of Chicago, IL

First Year Faculty Advisor:

2014-2015 *R. Hardison*, Biomedical Sciences Graduate Program, The Ohio State University (OSU)

2013-2014 *A. Adamovich*, Biomedical Sciences Graduate Program, OSU

2012-2013 *M. Muccigrosso*, Integrated Biomedical Science Graduate Program, OSU

2006-2007 *L. Franz*, Integrated Biomedical Science Graduate Program, OSU

Faculty Advisory Committee Member, First Year Graduate Students:

2006-2007 *R. Allen*, Integrated Biomedical Science Graduate Program, OSU

2006-2007 *C. Bolyard*, Integrated Biomedical Science Graduate Program, OSU

2006-2007 *S. Luong*, Integrated Biomedical Science Graduate Program, OSU

2005-2006 *S. Richards*, Integrated Biomedical Science Graduate Program, OSU

Graduate Rotation Students:

2007, Spring *B. Anthony*, Integrated Biomedical Science Graduate Program, OSU

2006, Winter *A. Nagy*, Integrated Biomedical Science Graduate Program, OSU

2006, Autumn *A. Beltramini*, Integrated Biomedical Science Graduate Program, OSU

2005, Spring *S. Richards*, Integrated Biomedical Science Graduate Program, OSU

Medical Fellow Scholarship Oversight Committee:

2018-present	K. Groves, Critical Care Medicine, Nationwide Children's Hospital W. Guider, Critical Care Medicine, Nationwide Children's Hospital T. Karube, Critical Care Medicine, Nationwide Children's Hospital T. Nickerson, Critical Care Medicine, Nationwide Children's Hospital
2016-2018	M. Akande, Critical Care Medicine, Nationwide Children's Hospital M. Daniel, Critical Care Medicine, Nationwide Children's Hospital J. Naples, Critical Care Medicine, Nationwide Children's Hospital B. Shutes, Critical Care Medicine, Nationwide Children's Hospital

Undergraduate Research Students:

2011-2012	A. Dutko, The Ohio State University, Columbus, OH
2010-2011	V. Tann, The Ohio State University, Columbus, OH
2005	R. Hard, Ohio Northern University, Ada, OH S. Maturu, University of Cincinnati, Cincinnati OH T. Edwards, University of Southern Maine, Gorham, ME

Member Doctoral Candidate Committee:

2017-2018	M. Ward, Biomedical Sciences Graduate Program, OSU Mentor: Dr. L. Bakaltez
2015-2018	R. Hardison, Biomedical Sciences Graduate Program, OSU Mentors: Dr. K. Mason and Dr. S. Justice
2009-2013	F. Raffel, Integrated Biomedical Science Graduate Program, OSU Mentor: Dr. K. Mason
2006-2010	S. Richards, Integrated Biomedical Science Graduate Program, OSU Mentor: Dr. J. Gunn
2005-2009	C. Clay, Medical Scientist Training Program, OSU Mentors: Dr. L. Schlesinger and Dr. J. Gunn

Doctorate Dissertation Examination Committee Graduate Faculty Representative:

2018	S. White, Department of Physics, OSU
2015	S. Cruz, Department of Spanish and Portuguese, OSU
2013	A. Zampaulo, Department of Spanish and Portuguese, OSU
2011	A. R. Blisset, Biophysics Graduate Program, OSU
2009	G. L. Beamer, Veterinary Biosciences, OSU
2008	A. J. Toole, Vision Science Graduate Program, OSU
2006	L. Rivers, Environmental Science Graduate Program, OSU

Master's Thesis Examination Committee:

2006-2007	A. Burnaugh, Department of Pathology, OSU Mentor: Dr. S. King
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Bodies Capstone Research Program Mentor:

2015	J. Brown, Metro High School, Columbus, OH
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Research Interns:

2016-2017	J. Brown, Metro High School, Columbus, OH
2013	M. Berry, East High School, Columbus, OH; Summer Scientist Internship Program

1st Place Winner Nationwide Children's Hospital Poster Competition and Recipient of the Nationwide Children's Hospital Tomorrow's Scientist Scholarship Award

SERVICE AND PARTICIPATION

National and International Professional Service

- 2020-present* *Director, The Neisseria Research Society, Monoclonal Antibody and Human Cell Repository*
- 2020-2021* *Co-convener, The Neisseria Research Society, The 1st Neisseria gonorrhoeae Research Society Conference*
- 2020* *Invited abstract reviewer, The 22nd International Pathogenic Neisseria Meeting, Host-Pathogens Interactions Section, Stellenbosch, South Africa*
- 2019* *Grant reviewer, The United Kingdom Research and Innovation Medical Research Council (UKRI-MRC)*
- Grant reviewer, Health Research Council of New Zealand (HRC); 2019 HRC-NSFC Biomedical Research Fund*
- 2018* *Founding member, Neisseria Research Society*
- Chair, Gonococcal Vaccines, The 21st International Pathogenic Neisseria Meeting, Asilomar, CA*
- Co-chair, Workshop on Cellular and Animal Models of Neisserial Colonization, Infection, and Pathogenesis, Asilomar, CA.*
- Invited member, The 21st International Pathogenic Neisseria Meeting Scientific Organizing Committee, Asilomar, CA*
- Invited panelist/participant, "Future Directions for Gonococcal Research", Sonoma Valley, CA*
- 2016* *Invited abstract reviewer, The 20th International Pathogenic Neisseria Meeting, Molecular and Cellular Biology Section, Manchester, UK*
- 2015* *Invited participant, National Institute of Allergy and Infectious Diseases workshop, "Gonorrhea Vaccines: The Way Forward", Bethesda, MD*
- 2014-2018* *Gonococcal Vaccine Consortium (GVC) - "Core Groups" of active involvement: 1) Antigen discovery, 2) Pre-clinical Testing and Assay Development, and 3) Epidemiology and Computational Modeling*

- 2014 *Neisseria gonorrhoeae* Antibiotic Resistance and Spread Workshop, The 19th International Pathogenic *Neisseria* Conference, Asheville, NC
Gonorrhea Vaccines Workshop, The 19th International Pathogenic *Neisseria* Conference, Asheville, NC
- 2013 *Invited abstract reviewer*, STI & AIDS World Congress, Social and Behavioral Sciences Track, Vienna, AUT
- 2012 Gonococcal Vaccines Workshop, The 18th International Pathogenic *Neisseria* Conference, Wurzburg, Germany
- 2011-2018 *Presentation Judge*, The Ohio Branch of the American Society for Microbiology Spring Meeting. Ohio University, Athens, OH.
- 2010 *Chair*, Cellular Microbiology, The 17th International Pathogenic *Neisseria* Meeting, Banff, Alberta CAN

Academic and Administrative Service

- 2018-present *Co-chair*, Research Institute Awards Committee, The Abigail Wexner Research Institute
- 2018 *Student Advisor*, Bench to Bedside (B2B) Seminar, Infectious Diseases Institute, The Ohio State University
- 2017 *Judge* (oral presentations), Infectious Diseases Consortium Research Day, The Research Institute at Nationwide Children's Hospital
- 2016 *Judge* (poster presentations), Early College Experience Poster Competition, Metro Early College High School, Columbus, OH
- Interviewer* (student applicants), Biomedical Sciences Graduate Program, The Ohio State University
- 2015-present *Member*, Institutional Biological Safety Committee, The Abigail Wexner Research Institute at Nationwide Children's Hospital
- Member*, Finance and Sponsored Projects Committee, The Research Institute at Nationwide Children's Hospital
- 2015 *Judge* (oral presentations), Infectious Diseases Consortium Research Day, The Research Institute at Nationwide Children's Hospital
- Member*, Lab Supply Bid Committee, The Research Institute at Nationwide Children's Hospital
- 2013 *Abstract Reviewer*, Center for Clinical & Translational Science Annual Research Meeting, The Ohio State University

- 2012-2017* *Member*, Professional Development and Mentoring Committee. The Department of Microbial Infection and Immunity, The Ohio State University
- 2012-2014* *Abstract Reviewer and Oral Presentation Judge*, Biomedical Sciences Graduate Program Annual Research Meeting, The Ohio State University
- 2012-2013* *Member*, The Research Institute at Nationwide Children's Hospital Retreat Planning Committee, The Research Institute at Nationwide Children's Hospital
- 2012* *Representative* (Integrated Biomedical Science Graduate Program Committee), Office of Diversity and Inclusion's Graduate School Visit Day, The Ohio State University
- 2011-2016* *Member*, Integrated Biomedical Science Graduate Program Graduate Studies Committee, The Ohio State University
- 2011-2013* *Member*, Center for Microbial Interface Biology Research Retreat Organizing Committee, The Ohio State University
- 2010-2012* *Member*, Center Director Search Committee for the Center for Molecular and Human Genetics, The Research Institute at Nationwide Children's Hospital
- 2009-present* *Judge* (poster presentations), The Abigail Wexner Research Institute at Nationwide Children's Hospital Scientific Retreat, The Research Institute at Nationwide Children's Hospital
- 2009-2010* *Member*, Shared Equipment Oversight Committee, The Research Institute at Nationwide Children's Hospital
- 2007-2017* *Organizer*, Bench to Outcomes Seminar Series (BOSS) Organizing Committee, The Research Institute at Nationwide Children's Hospital
- Judge* (poster and oral presentations), The Center for Microbial Interface Biology Scientific Retreat, The Ohio State University
- 2007-2009* *Member*, The Research Institute at Nationwide Children's Hospital Retreat Planning Committee, The Research Institute at Nationwide Children's Hospital
- 2005-present* *Judge* (poster presentations), Annual Medical College Graduate and Postgraduate Research Day, The Ohio State University
- 2005-2011* *Contact and Coordinator*, Field Emission-Scanning Electron Microscope acquisition, installation, and training
- 2005-2009* *Judge* (poster presentations), College of Medicine Future Physician Scientist Award, The Ohio State University

- 2005-2008 *Interviewer* (student applicants), Integrated Biomedical Science Graduate Program, The Ohio State University
- Member*, Center for Microbial Pathogenesis Faculty Search Committee, The Research Institute at Nationwide Children's Hospital
- 2005-2007 *Participant*, Girls are Great! The Research Institute at Nationwide Children's Hospital (formerly Columbus Children's Hospital)

Editorial Service

Ad hoc Reviewer for the following Journals:

Nature Mucosal Immunology	Nature Scientific Reports
PLoS Pathogens	PLoS One
Cellular Microbiology	PLoS Medicine
Molecular Microbiology	Antimicrobial Agents and Chemotherapy
Infection and Immunity	Critical Reviews in Microbiology
Clinical and Vaccine Immunology	Frontiers in Immunology
Journal of General Microbiology	Journal of Basic Microbiology
Journal of Inflammation Research	Infection and Drug Resistance
The Application of Clinical Genetics	Journal of Clinical Microbiology
Journal of Visualized Experiments	Retrovirology

Editor:

- 2015-present *Associate Editor*, Critical Reviews in Microbiology, CRC Press, Taylor and Francis Group, Informa PLC, Oxford, UK
- 2010-present *Review Editor*, Frontiers in Cellular and Infection Microbiology, Frontiers Research Foundation, Parc Scientifique, Lausanne, Switzerland

Permanent Grant Review Panel Member:

- 2019-present Pregnancy and Neonatology (PN) Study Section; National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases

Ad hoc Grant Reviewer:

- 2019 The United Kingdom Research and Innovation Medical Research Council (UKRI-MRC)
- Health Research Council of New Zealand (HRC); 2019 HRC-NSFC Biomedical Research Fund
- 2018 Pregnancy and Neonatology (PN) Study Section; National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
- Topics in Bacterial Pathogenesis (ZRG1 IDM-B 80 S); National Institutes of Health, National Institute of Allergy and Infectious Diseases

- Special Emphasis Panel ZAI1 AWA-M (M1); Sexually Transmitted Infections Cooperative Research Centers (STI CRC): Vaccine Development (U19); National Institutes of Health, National Institute of Allergy and Infectious Diseases
- 2017 Vaccines Against Microbial Diseases Study Section (VMD); National Institutes of Health, National Institute of Allergy and Infectious Diseases
- 2016 Drug Discovery and Mechanisms of Antimicrobial Resistance Study Section (DDR) and the Clinical Research and Field Studies of Infectious Diseases Study Section (CRFS) Special Review Panel ZRG1 IDM-V (07) S, Topics in Microbial Pathogenesis and Therapeutic Research; National Institutes of Health, National Institute of Allergy and Infectious Diseases
- 2015 Pregnancy and Neonatology (PN) Study Section; National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
- Dean's Discovery Grant Program & Nationwide/COM Cross-Campus Collaborative Pilot Program*; Center for Clinical and Translational Science, The Ohio State University College of Medicine
- 2013-2018 Oklahoma Center for the Advancement of Science and Technology's (OCAST) Health Research Program, Review Panelist
- 2013 Pregnancy and Neonatology (PN) Study Section; National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
- The William H. Davis Endowment for Basic Medical Research and Richard P. and Marie R. Bremer Medical Research Fund*; Center for Clinical and Translational Science, The Ohio State University Pilot and Collaborative Studies Program
- 2012 Ohio University Research Committee, Ohio University, Athens, OH
- 2011 *General Focus Pilot RFA*; Center for Clinical and Translational Science, The Ohio State University
- 2010 Cellular, Molecular, and Integrative Reproduction (CMIR) Study Section; National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
- Pilot and Collaborative Studies Program RFA*; Center for Clinical and Translational Science, The Ohio State University
- 2009 Endocrinology, Metabolism, Nutrition, and Reproductive Sciences Challenge Grants Panel, Integrative Nutrition and Metabolic Processes

(INMP); National Institute of Diabetes and Digestive and Kidney Diseases

HONORS AND AWARDS

- 2019 Targeting complement receptor 3 on primary human cervical cells has the potential to cure *Neisseria gonorrhoeae* infection. The STI & AIDS World Congress: the 20th International Union against Sexually Transmitted Infections (IUSTI) and the 23rd International Society for Sexually Transmitted Disease Research (ISSTD) Joint World Congress, Vancouver, British Columbia Canada. Highly commended oral presentation.
- The STI & AIDS World Congress: the 20th International Union against Sexually Transmitted Infections (IUSTI) and the 23rd International Society for Sexually Transmitted Disease Research (ISSTD) Joint World Congress, Vancouver, British Columbia Canada. Abstract selected for plenary session presentation.
- The Canadian Glycomics Symposium, Banff, Alberta Canada. Abstract selected for plenary session presentation.
- 2018 International Pathogenic *Neisseria* Meeting, Asilomar, CA. Abstract selected for plenary session presentation.
- FASEB Science Research Conference: Microbial Glycobiology, Scottsdale, AZ. Abstract selected for plenary session presentation.
- 2017 BacPath 14: The Molecular Biology of Bacterial Pathogens, Hahndorf, Australia. Abstract selected for plenary session presentation.
- 2014 International Pathogenic *Neisseria* Meeting, Asheville, NC. Abstracts (2) selected for plenary session presentation.
- 2013 BacPath 12: Molecular Analysis of Bacterial Pathogens, The Australian Society for Microbiology, Queensland, Australia. Abstract selected for plenary session presentation.
- The Center for Microbial Interface Biology Research Retreat. The Ohio State University, Columbus, OH. Abstract selected for plenary session presentation.
- 2011 1st European Conference of Microbiology and Immunology; Budapest, Hungary. Abstracts (2) selected for plenary session presentation.
- Invitational Honorary Member of the Latin American Association of Immunology (ALAI) and the Cuban Society for Immunology (CSI). Investiture May, 2011.

- The 7th Immunology Congress Vaccines and Adjuvants Workshop dedicated to *Neisseria* Vaccines; Havana, Cuba. Abstracts (2) selected for plenary session presentation.
- 2010 International Pathogenic *Neisseria* Conference; Banff, AB, Canada. Abstracts (2) selected for plenary session presentations
- 2007 Young Investigator Award, Columbus Children's Research Institute, Columbus, OH. Intramural Research Support Award
- 2006 International Pathogenic *Neisseria* Conference; Cairns, QLD, Australia. Abstract selected for plenary session presentation
- 2004 International Pathogenic *Neisseria* Conference; Milwaukee, WI. Abstract selected for plenary session presentation
- Igor Stojiljkovic/Raoul Rosenthal Memorial Travel Award*, International Pathogenic *Neisseria* Conference Organizing Committee
- 2003-2005 NIH Loan Repayment Program Recipient
- 2003 *Deans' Distinguished Dissertation Award*, University of Iowa, Graduate College, "...a special, occasional, award presented to scholars who have submitted superior dissertations..."
- 2001-2003 *D. C. Priestersbach Dissertation Prize* Department of Microbiology nominee for The University of Iowa "...a precursory award to the Council of Graduate Schools/University Microfilms International Distinguished Dissertation Award..."
- NIH Post-doctoral Fellowship, University of Iowa, Department of Internal Medicine
- 2002 International Pathogenic *Neisseria* Conference; Oslo, Norway. Abstract selected for plenary session presentation
- NIH Post-doctoral Fellowship, University of Iowa, College of Medicine, Division of Infectious Diseases
- 2001 First place poster competition, University of Iowa, College of Medicine Research Week
- First place poster, James F. Jakobsen Graduate College Conference, the University of Iowa Graduate College
- Richard and Mary Finkelstein Student Travel Grant*, American Society for Microbiology General Meeting, Orlando, FL; "...one of six awards given annually to students demonstrating excellence in the area of microbial pathogenesis."

- 2000 International Pathogenic *Neisseria* Conference; Galveston, TX.
Abstract selected for plenary session presentation
- Pre-doctoral Research Fellowship, National Institutes of Health
Training Grant, the University of Iowa, Department of Internal
Medicine
- Abstract selected for Meeting Press Release; American Society for
Microbiology General Meeting
- Rachel Mason Travel Grant*, University of Iowa, Department of
Microbiology
- First place poster competition, Iowa Microscopy Society Annual
Meeting, Iowa City, IA
- 1999 Iowa Microscopy Society Annual Meeting, Guest Speaker in Recognition
of Outstanding Performance as a Student Researcher
- 1996-1997 Graduate Teaching Assistantship, Bemidji State University, Department
of Biology
- 1995 *Fishing for Fun Scholarship*, Biology Departmental Merit Scholarship,
Bemidji State University, Department of Biology
- 1994-1995 Biology Departmental Merit Award, Bemidji State University,
Department of Biology
- Alliss Educational Foundation Scholarship*, Bemidji State University,
Bemidji, MN

Highlighted Manuscripts and Abstracts

Editor Selected Featured Papers:

- 2013 Jen, F. E.-C., M. J. Warren, B. L. Schulz, P. M. Power, W. E. Swords, J.
N. Weiser, M. A. Apicella, **J. L. Edwards**, and M. P. Jennings. Dual
pili post-translational modifications synergize to mediate
meningococcal adherence to platelet activating factor receptor on
human airway cells. *PLoS Pathogens* 9:e1003377. (Editor selected
Featured Research)
- Jen and Warren contributed equally to this work; **Edwards** and
Jennings are joint senior/corresponding authors
- 2011 Jennings, M. P., F. Jen, L. Roddam, M. A. Apicella, and **J. L.
Edwards**. Pilin glycosylation modulates CR3-mediated *Neisseria
gonorrhoeae* infection of primary, human, cervical epithelial cells.
- Denoted as a “*top article*” by *Cellular Microbiology* Online Early
website

Subject of editor-invited commentary: Kahler, CM (2011) Sticky and Sweet: The role of post-translational modifications on neisserial pili. *Front Cell Infect Microbiol*. Doi:10.3389/fmicb.2011.00087.

- 2010 **Edwards, J. L.** *Neisseria gonorrhoeae* survival during primary, human, cervical epithelial cell infection requires nitric oxide and is augmented by progesterone. *Infect. Immun.* 78:1202-1213. (Editor selected *Spotlight*)
- 2008 Lim, K. H. L, C. E. Jones, R. N. vanden Hoven, **J. L. Edwards**, M. A. Apicella, M. P. Jennings and A. G. McEwan. Metal binding specificity of the MntABC permease system of *Neisseria gonorrhoeae* and its role in cell growth and survival. *Infect. Immun.* 76:3569-3576. (Editor selected *Spotlight*)
- 2006 **Edwards, J. L.** and MA Apicella. *Neisseria gonorrhoeae* PLD directly interacts with Akt kinase upon infection of primary, human, cervical epithelial cells. *Cell. Microbiol.* 8:1253-1271. (*Cover Highlight*)
- 2001 **Edwards, J. L.**, E. J. Brown, K. A. Ault, and M. A. Apicella. The role of complement receptor 3 (CR3) in *Neisseria gonorrhoeae* infection of human cervical epithelia. *Cell. Microbiol.* 3:611-622. (*Cover Highlight*)

Recommended Papers:

- 2008 **Edwards, J. L.** The role of complement in gonococcal infection of cervical epithelia. *Vaccine* 26S:156-161. (*Recommended by the BioInfoBank Institute*)
- 2004 **Edwards, J. L.** and MA Apicella. *Neisseria gonorrhoeae*: The molecular mechanisms that initiate infection differ between men and women. *Clin. Microbiol. Rev.* 17:965-981. (*Recommended by the BioInfoBank Institute*)

Meeting Highlights:

- 2000 Ruffles and ribbons: studies of gonococcal infection in a model of the lower female genital tract. 100th General Meeting of the American Society for Microbiology, Los Angeles, CA. (*Press Release*)

SCHOLARSHIP

Publications

44. Poole, J., C. J. Day, T. Haselhorst, F. E-C. Jen, V. J. Torres, **J. L. Edwards**, and M. P. Jennings (2019) Repurposed Drugs that Block the Gonococcal-Complement Receptor 3 Interaction can Prevent and Cure Gonococcal Infection of Primary Human Cervical Epithelial Cells. *mBio* 11(2): e03046-19; DOI: 10.1128/mBio.03046-19

Poole and Day contributed equally to this work; **Edwards** and Jennings are joint senior authors

43. Chen, N., C-L. Ong, J. O'Sullivan, I. Ibranovic, K. Davey, **J. L. Edwards**, and A. G. McEwan (2019) Two distinct L-lactate dehydrogenases play a role in the survival of *Neisseria gonorrhoeae* in cervical epithelial cells. *J Infect Dis.* 221 (3), 449-453. doi: 10.1093/infdis/jiz468

42. Edwards, J. L., C. Day, and M. P. Jennings (2019) Targeting complement receptor 3 on primary human cervical cells has the potential to cure *Neisseria gonorrhoeae* infection. *Sex Transm Infect.* 95 Suppl 1:A76-A77 doi: 10.1136/sextrans-2019-sti.197

41. Edwards, J. L., M. P. Jennings, and K. L. Seib (2018) *Neisseria gonorrhoeae* vaccine development. Hope on the horizon? *Curr Opin Infect Dis.* 31:246-250. PMID: 29601324 (*Invited Review*)

40. Edwards, J. L., M. P. Jennings, M. A. Apicella, and K. L. Seib (2016) Is gonococcal disease preventable? Importance of understanding immunity and pathogenesis in vaccine development. *Crit Rev Microbiol.* 42:928-941. PMC4958600

Edwards and Seib are joint senior authors

39. Craig, A. P., R.T. Gray, **J.L. Edwards**, M. A. Apicella, M. P. Jennings, D. P. Wilson, and K. L. Seib (2015) The potential impact of vaccination on the prevalence of gonorrhoea. *Vaccine* 33:4520-4525. PMC4743649

38. Atack, J. M., I. Ibranovitch, C.-L. Y. Ong, K. Y. Djoko, N. H. Chen, R. vanden Hoven, M. P. Jennings, **J. L. Edwards**, and A. G. McEwan (2014) A role for lactate dehydrogenases in the survival of *Neisseria gonorrhoeae* in human polymorphonuclear leukocytes and cervical epithelial cells. *J Infect Dis.* 210:1311-1318. DOI: 10.1093/infdis/jiu230. PMC4215069

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Hardison, R.L., C. J. Day, Belinda Spillings, J. Mak, M. P. Jennings, and **J. L. Edwards** (2020) Complement receptor 3 facilitates HIV-1 binding and transcytosis across primary cervical epithelial cells. The 19th annual The Ohio State University College of Medicine Trainee Research Day, Columbus, OH. April 2020. (As a result of Covid-19 related conference cancellation, this peer-reviewed abstract was accepted but not presented)

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Edwards, J. L., J. Poole, C. J. Day, T. Haselhorst, F. E.-C. Jen, and M. P. Jennings (2019) The specific *Neisseria gonorrhoeae* pilin-linked glycan structure dictates the host response to cervical infection and exists as a viable target to cure disease in women. The Canadian Glycomics Symposium, Banff, Alberta Canada. May 2019. *Selected for plenary session presentation

Day, C. J., **J. L. Edwards,** and M. P. Jennings (2018) A repurposing screen identifies drugs that block interactions between *Neisseria gonorrhoeae* and human cervical cells that have potential to prevent and cure cervical infection in women. 21st International Pathogenic *Neisseria* Meeting, Asilomar, CA. September 2018. *Selected for plenary session presentation

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Brown, J. A., B. D. Baker, and **J. L. Edwards** (2016) *Kingella kingae mreB* mutation leads to increased sensitivity to antibiotics and reactive oxidants. Regional State Science Day, The Ohio Academy of Science. *1 of 3 regional winners selected to proceed to state level competition

Baker, B. D. and **J. L. Edwards** (2016) A novel approach to the growing problem of MRSA infections: targeting the cold shock protein, CspA, and staphylococcal pigment production using anti-tumor agents. The Research Institute at Nationwide Children's Hospital Annual Retreat, Columbus, OH. *2nd Place Poster

Poole, J., C. Day, F. E.-C. Jen, L. Hartley-Tassell, V. J. Torres, **J. L. Edwards,** and M. P. Jennings (2015) *Neisseria gonorrhoeae* and CR3: probing the lectin functions of the I-domain of CD11b. BacPath 13: Molecular Analysis of Bacterial Pathogens, Phillip Island, Australia. September 2015.

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Gawthorne, J. A., T. J. Edwards, A. Folley, and **J. L. Edwards** (2013) Contributing factors for adverse pregnancy outcomes: cellular studies of *Neisserial gonorrhoeae* infection of primary human cervical and amniochorion epithelial cells. 113th General Meeting of the American Society for Microbiology, Denver, CO.

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Edwards, J. L. and T. J. Edwards (2011) Nitric oxide promotes *Neisseria gonorrhoeae* infection of primary cervical epithelial cells. The 7th Immunology Congress Vaccines and Adjuvants Workshop dedicated to *Neisseria* Vaccines. Havana, Cuba. *Selected for plenary session presentation

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Srikhanta, Y. N., **J. L. Edwards**, M. L. Falsetta, T. L. Maguire, S. M. Grimmond, M. A. Apicella, and M. P. Jennings (2008) Phasevarion mediated differentiation of *Neisseria gonorrhoeae*. 16th International Pathogenic *Neisseria* Conference, Rotterdam, The Netherlands

Edwards, J. L. (2006) Hormonal modulation of CR3-mediated *Neisseria gonorrhoeae* infection of primary, human, cervical epithelial cells. 13th Annual Midwest Microbial Pathogenesis Meeting, Cincinnati, OH.

Dominguez, N. M., H. L. Hamilton, **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2005) Integration and excision of the gonococcal genetic island of *Neisseria gonorrhoeae*. 105th General Meeting of the American Society for Microbiology, Atlanta, GA.

Edwards, J. L. and M. A. Apicella. (2004) I-domain-containing alpha integrins serve as pilin receptors for *Neisseria gonorrhoeae* adherence to human epithelial cells. 14th International Pathogenic *Neisseria* Conference, Milwaukee, WI.

Dominquez, N. M., H. L. Hamilton, **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2004) The gonococcal genetic island of *Neisseria gonorrhoeae*: a mobile genetic element. 14th International Pathogenic *Neisseria* Conference, Milwaukee, WI.

Hamilton, H. L., **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2004) The gonococcal genetic island-encoded type IV secretion system is involved in infection. 14th International Pathogenic *Neisseria* Conference, Milwaukee, WI.

Edwards, J. L. and M. A. Apicella. (2004) Signal transduction events triggered by *Neisseria gonorrhoeae* engagement of CR3 on cervical epithelia are modulated by gonococcal PLD. 104th General Meeting of the American Society for Microbiology, New Orleans, LA.

Hamilton, H. L., N. M. Dominquez, **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2004) Interactions of *Neisseria gonorrhoeae* with the host: a role for the gonococcal genetic island-encoded type IV secretion system in infection. 104th General Meeting of the American Society for Microbiology, New Orleans, LA.

Edwards, J. L., D. Entz, and M. A. Apicella (2003) The modulatory role of *Neisseria gonorrhoeae* PLD in complement receptor 3-mediated pathogenesis of primary, human, cervical epithelia. 10th Annual Midwest Microbial Pathogenesis Meeting, Iowa City, IA.

Hamilton, H. L., **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2003) The type IV secretion system of *Neisseria gonorrhoeae* is involved in DNA secretion and bacteria-host cell interactions. 10th Annual Midwest Microbial Pathogenesis Meeting, Iowa City, IA.

Hamilton, H. L., J. M. Skarie, **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2003) The Type IV secretion system of *Neisseria gonorrhoeae* secretes DNA and is involved in host cell interactions. 103rd General Meeting of the American Society for Microbiology, Washington, DC.

Edwards, J. L., D. Entz, and M. A. Apicella (2002) *Neisseria gonorrhoeae* specifically release a phospholipase D homolog that augments CR3-mediated cervical cell infection. 9th Annual Midwest Microbial Pathogenesis Meeting, Indianapolis, IN.

Hamilton, H. L., J. M. Skarie, **J. L. Edwards**, M. A. Apicella, and J. P. Dillard (2002) Type IV secretion system mutants of *Neisseria gonorrhoeae* are deficient in DNA secretion and show altered interactions with host cells. 13th International Pathogenic *Neisseria* Conference, Oslo, Norway. *Highlighted poster

Edwards, J. L., E. J. Brown, S. Uk-Nham, J. G. Cannon, M. S. Blake, and M. A. Apicella (2002) Opsonic and non-opsonic interactions occur between *Neisseria gonorrhoeae* and complement receptor 3 on primary cervical epithelial cells. 102nd General Meeting of the American Society for Microbiology, Salt Lake City, UT.

Dillard, J. P., H. L. Hamilton, K. A. Cloud, K. J. Schwartz, **J. L. Edwards**, and M. A. Apicella (2002) Sequence and mutational analysis of the 60 kb gonococcal genetic island. Molecular Genetics of Bacteria and Phages Annual Meeting, Cold Spring Harbor Laboratory, NY.

Edwards, J. L. and M. A. Apicella (2001) The specific interaction of *Neisseria gonorrhoeae* with complement receptor type 3 (CR3) on primary cervical epithelial cells. 8th Annual Midwest Microbial Pathogenesis Meeting, Champaign/Urbana, IL.

Edwards, J. L., J. Shao, K. Ault, E. J. Brown, M. A. Apicella (2001) Complement receptor type 3 (CR3) on primary cervical epithelial cells serves as a receptor for *Neisseria gonorrhoeae*. 101st General Meeting of the American Society for Microbiology, Orlando, FL.

Edwards, J. L., J. Shao, K. Ault, and M. A. Apicella (2000) Studies on the invasion of primary human cervical epithelial cells by *Neisseria gonorrhoeae*. 100th General Meeting of the American Society for Microbiology, Los Angeles, CA.

Zenni, M. K., **J. L. Edwards**, J. Shao, M. R. Ketterer, R. D. Williams, and M. A. Apicella (2000) CD66 carcinoembryonic antigens as receptors for *Neisseria gonorrhoeae* in human urethral epithelial cell systems. 95th American Urological Association Annual Meeting, Atlanta, GA.

Invited Seminars and Symposia

Local:

A novel lectin function for the I-domain region of complement receptor 3/CD11b. The Center for Microbial Interface Biology Research Symposium, The Ohio State University, Columbus, OH. April 2016.

Neisserial pilin post-translational modifications and their role in pathogenesis. The Center for Microbial Interface Biology, The Ohio State University, Columbus, OH. March 2014.

Insights into meningococcal disease. The Bench to Outcomes Seminar Series. The Research Institute at Nationwide Children's Hospital, Columbus OH. March, 2014.

Gonococcal infections in adolescent women. The Bench to Outcomes Seminar Series. Nationwide Children's Hospital and Research Institute, Columbus OH. October 2008.

Progesterone and nitric oxide augment gonococcal cervical infection. Children's Health Research Center Seminar Series. Nationwide Children's Hospital and Research Institute Columbus, OH. October 2007.

Hormonal *Aktions* in gonococcal cervicitis. Children's Research Institute Annual Retreat. Newark, OH. April 2005.

Estrogen and Akt kinase contribute to CR3-mediated *Neisseria gonorrhoeae* infection of primary human cervical epithelial cells. Molecular Virology, Immunology, and Medical Genetics Graduate Program Seminar. April 2005.

Challenges associated with the study of gonococcal disease. Student Fellow Research Training Series. Columbus Children's Research Institute. December 2005. (*Student Invited Speaker*)

The role of the alternative complement pathway in the interaction of the gonococcus with CR3

on primary cervical epithelial cells. The Department of Internal Medicine Inflammation Group Seminar Series, Iowa City, IA. May 2001.

National and Regional:

A Vaccine Against Gonorrhea: Are We There Yet? IDWeek: Joint annual meeting of the Infectious Diseases Society of America, Society for Healthcare Epidemiology of America (SHEA), the HIV Medical Association, and the Pediatric Infectious Diseases Society, Washington DC. October 2019.

Complement receptor 4 mediates *Neisseria gonorrhoeae* infection of human amnion epithelia. Midwest Microbial Pathogenesis Conference, Indianapolis, IN. August 2015.

Pilin post-translational modifications mediate *Neisseria meningitidis* adherence to the platelet activating factor receptor (PAFr) on human airway epithelia. The Ohio Branch of the American Society for Microbiology Annual Meeting, Ashland, OH. April 2013.

Gonococcal nitric oxide respiratory and detoxification mechanisms contribute to infection of primary cervical epithelial cells. The Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI. October 2007.

Nitric oxide promotes *Neisseria gonorrhoeae* infection of primary cervical epithelial cells. 14th Annual Midwest Microbial Pathogenesis Meeting, Chicago, IL. September 2007.

The modulatory role of *Neisseria gonorrhoeae* PLD in complement receptor 3-mediated pathogenesis of primary, human, cervical epithelia. Children's Research Institute. Columbus, OH. November 2003.

Gonococcal PLD modulates CR3-dependent infection of cervical epithelia. Wyeth Vaccines Research. Rochester, NY. July 2003.

Studies of the interaction of *Neisseria gonorrhoeae* with primary human cervical epithelial cells. Iowa Microscopy Society Annual Meeting, Iowa City, IA. September 1999.

International:

Targeting complement receptor 3 on primary human cervical cells has the potential to cure *Neisseria gonorrhoeae* infection. The STI & AIDS World Congress: the 20th International Union against Sexually Transmitted Infections (IUSTI) and the 23rd International Society for Sexually Transmitted Disease Research (ISSTD) Joint World Congress, Vancouver, British Columbia Canada. July 2019.

The specific *Neisseria gonorrhoeae* pilin-linked glycan structure dictates the host response to cervical infection and exists as a viable target to cure disease in women. The Canadian Glycomics Symposium, Banff, Alberta Canada. May 2019.

The specific, phase-variable, glycan structure added to *Neisseria gonorrhoeae* pilin dictates the host response to cervical infection. FASEB Science Research Conference: Microbial Glycobiology, Scottsdale, AZ. June 2018.

Insights into maternal gonorrhea: human primary cervical and amniochorionic epithelial cell responses to *Neisseria gonorrhoeae* infection. The STI & AIDS World Congress: the 14th International Union against Sexually Transmitted Infections (IUSTI) and the 20th International

Society for Sexually Transmitted Disease Research (ISSTD) Joint World Congress, Vienna, Austria. July 2013.

General Meeting of the Australian Society for Microbiology, Women's and Children's Microbiology Symposium, Adelaide, Southern Australia. July 2013.

Insights into the gonococcal-cervical dynamic as determined using a primary human epithelial cell model of infection. The Schools of Molecular & Microbial Sciences and Chemistry & Molecular Bioscience. The University of Queensland. Brisbane, QLD Australia. December 2011.

Gonococcal infection of primary cervical epithelial cells: the complement system and beyond. Cell and Molecular Biosciences Program, Queensland University of Technology. Brisbane, QLD Australia. September 2011.

Cellular analyses of gonococcal infection of primary human cervical epithelial cells under conditions reflective of the *in vivo* environment. BacPath 11: Molecular Analysis of Bacterial Pathogens, The Australian Society for Microbiology, New South Wales, Australia. September 2011.

The effect of steroid hormones and oxygen availability on complement-mediated infection of the primary cervical cells. The 7th Immunology Congress Vaccines and Adjuvants Workshop dedicated to *Neisseria* Vaccines. Havana, Cuba. June 2011.

Nitric oxide promotes *Neisseria gonorrhoeae* infection of primary cervical epithelial cells. The 7th Immunology Congress Vaccines and Adjuvants Workshop dedicated to *Neisseria* Vaccines. Havana, Cuba. June 2011.

Gonococcal challenge of primary human epithelial cells: steroid hormones and nitric oxide, friends or foes? 1st European Conference of Microbiology and Immunology. Budapest, Hungary. May 2011.

Complement receptor 3 activation during cervical infection requires an interaction with the *Neisseria gonorrhoeae* pilin glycan. 1st European Conference of Microbiology and Immunology. Budapest, Hungary. May 2011.

Gonococcal cervical and amniochorionic infections as potential factors contributing to adverse pregnancy outcomes. 17th International Pathogenic *Neisseria* Conference, Banff, Alberta Canada. September 2010.

The gonococcal pilin glycan mediates primary cervical epithelial cell challenge. 17th International Pathogenic *Neisseria* Conference, Banff, Alberta Canada. September 2010.

Neisseria gonorrhoeae phospholipases in amniochorionic infections. FASEB Science Research Conference: Phospholipid Metabolism: Disease, Signal Transduction, and Membrane Dynamics. Steamboat Springs, CO USA. July 2010

Host-derived nitric oxide is required for *Neisseria gonorrhoeae* survival during cervical infection. The Schools of Molecular & Microbial Sciences and Chemistry & Molecular Bioscience. The University of Queensland. Brisbane, QLD Australia. October 2009.

The glycan on *Neisseria gonorrhoeae* pilin triggers CR3 activation during challenge of primary cervical epithelial cells. The Institute for Glycomics. Griffith University. Gold Coast, QLD Australia. October 2009.

The role of complement in gonococcal infection of cervical epithelia. Complement: The First Barrier of Innate Immunity Workshop. Siena, Italy. September 2008.

The role of *Neisseria gonorrhoeae* PLD in cervical cell infection. FASEB Science Research Conference: Phospholipid metabolism: disease, signal transduction, and membrane dynamics. New Haven, CT USA. July 2008.

Hormonal modulation of CR3-mediated *Neisseria gonorrhoeae* infection of primary, human, cervical epithelial cells. 15th International Pathogenic *Neisseria* Conference, Cairns, QLD Australia. September 2006.

Gonococcal PLD and signaling events triggered by *Neisseria gonorrhoeae* infection of primary cervical epithelial cells. 14th International Pathogenic *Neisseria* Conference, Milwaukee, WI USA. September 2004.

Neisseria gonorrhoeae directly binds to the I-domain of complement receptor 3 on primary cervical epithelial cells. 13th International Pathogenic *Neisseria* Conference, Oslo, Norway. September 2002.

Cellular studies on the invasion of primary cervical epithelial cells by *Neisseria gonorrhoeae*. 12th International Pathogenic *Neisseria* Conference, Galveston, TX. USA. November 2000.

Internal Seminars:

Splitting an arrow with a repurposed small molecule drug. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. October 2018.

Staphylococcus aureus: In times of recession, it's not wise to argue about the price of gold. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. September 2017.

Gonorrhea: Taking it to the mattresses. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. November 2015.

Project runway, science style: Tips to look and sound your best. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. April 2015.

Neisseria gonorrhoeae: Something old, something new, something borrowed, nothing blue. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. November 2014.

Colonization of the human airway by *N. meningitidis*. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. March 2012.

Biofilm development by *Neisseria gonorrhoeae*. Biofilms in Human Disease Group, The Center for Microbial Interface Biology, The Ohio State University. Columbus, OH. March 2011.

Clap on, clap off: remote control of gonococcal pathogenicity of primary amniochorionic epithelial cells. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. September 2009.

Cellular studies of primary cervical and amniochorionic epithelial cell infection by *Neisseria gonorrhoeae*. Center for Microbial Interface Biology, The Ohio State University, Columbus OH. April 2009.

Neisseria gonorrhoeae cervical infection and beyond. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. January 2009.

Pilus glycosylation modulates CR3-mediated *Neisseria gonorrhoeae* infection of cervical epithelial cells. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital, Columbus OH. July 2008.

Hormonal modulation of CR3-mediated *Neisseria gonorrhoeae* infection of primary, human, cervical epithelial cells. Center for Microbial Interface Biology, The Ohio State University; Columbus, OH. August 2006.

Gonococcal cervicitis: an intimate host-pathogen interplay. Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital; Columbus, OH. November 2005.

Gonococcal PLD plays a direct role in pilfering signaling events triggered upon infection of primary cervical epithelial cells, in part, through a direct association with Akt kinase. Center for Microbial Interface Biology, The Ohio State University; Columbus OH. February 2005.

RESEARCH SUPPORT AND SUMMARY

Research Support

Current Support:

R01AI134848; Edwards (PI)
NIH/NIAID

01/16/2018-12/31/2022

Title: *Novel carbohydrate binding functions of the CR3 I-domain modulate gonococcal cervical cell interactions.*

The major goals of this project are to define 1) the effect of variation in *N. gonorrhoeae* pilin glycan structure on direct interactions between pili and the CR3 I-domain and 2) the effect of glycan-CR3 I-domain interactions on CR3 function and the host response to *N. gonorrhoeae* cervical infection.

R01AI127863; Turner/Bazan (MPI)
NIH/NIAID

08/09/2017-07/31/2021

Edwards: Co-investigator

Title: *Clinical and molecular epidemiology of the sexual transmission of Neisseria meningitidis*
This project seeks to characterize the clinical and molecular epidemiology of a large, ongoing, molecularly-linked outbreak of urethritis caused by a distinct and novel clade of *Neisseria meningitidis*.

Previous Support:

Young Investigator Award; Edwards (PI) 05/01/2007 – 04/31/08
 The Research Institute at Nationwide Children's Hospital
 \$40,000 Intramural Research Support Award

1R21 AI082125-01; Edwards (PI) 6/01/2009 – 05/31/2011
 NIH/NIAID

Title: *Complement and hormone receptor modulation during gonococcal cervical infection*
 The major goals of this project were to define the expression and functional activity of steroid hormone receptors in primary human cervical epithelial (pex) cells and to define the specific effect(s) of estrogen and progesterone, as well as their respective cellular receptors, as contributing to complement-mediated *Neisseria gonorrhoeae* infection.

R01AI076398; Edwards (PI) 08/01/2009-07/31/2013
 NIH/NIAID (No cost extension to 07/31/2014)

Title: *The effect of hormones and oxygen-limitation on gonococcal pathophysiology.*
 The major goals of this project were to define, in terms of cervical infection, the effect of variable steroid hormone concentrations and oxygen limitation to 1) the gonococcal protein and gene expression profiles, 2) the gonococcus-CR3 interaction, and 3) gonococcal infection as it relates to the female menstrual cycle.

The Research Institute at Nationwide Children's Hospital 08/01/2014-12/31/2014

Arno Therapeutics; Edwards (PI) 08/01/2014-07/31/2015

Title: *Arno.*

The major goals of this project were to define, in terms of cervical infection, if a specific small molecule drug could function as an alternative treatment for multidrug-resistant *Ng* infections.

The Research Institute at Nationwide Children's Hospital 01/01/2015-12/31/2016

Research Statement

My research philosophy, and approach, focuses on the use of primary human cells derived from relevant tissues in the development of model systems of human disease. I am particularly interested in defining the mechanisms by which the strict human pathogen, *Neisseria gonorrhoeae* (*Ng*), causes disease of the female reproductive tract. It is my ultimate goal that a better understanding of these disease processes will lead to more effective ways to diagnose, treat, and prevent infections and, in turn, reduce the burden of disease sequelae observed disproportionately among women (and their children) following infection. In my research area, the literature is heavily populated with observations based on the use of biologically irrelevant immortal cell lines or animal models that lack the human-specific factors subverted by *Ng* to cause disease. Using primary human epithelial cell culture models, I discovered a series of "real" interactions, including *Ng* receptors (CR3, CR4, $\alpha 1\beta 2$ and $\alpha 2\beta 2$ I-domain-containing integrins), a secreted neisserial effector (phospholipase D) and its associated signaling pathways, the interplay between human hormone levels and nitric oxide production to which *Ng* responds and manipulates during cervical infection, as well as the first report of biofilm production by *Ng*. In addition to being the first description of functioning CR3, a molecule previously thought to be limited to cells of monocytic lineage, on mucosal epithelium; my identification of CR3 as the key

receptor mediating the interaction of gonococci with the cervical epithelium (*ex vivo* and *in vivo*) provided one explanation for the high prevalence of asymptomatic gonococcal cervicitis observed in women. Similarly, my work demonstrating that progesterone functions in an additive manner with secreted *Ng* phospholipase D to stimulate (host) nitric oxide production, which in turn promotes *Ng* survival, provided the first evidence to indicate how steroid hormones modulate the course of gonococcal disease in women, as is observed *in vivo*. More recently, we have used these cell models to identify novel host-targeted therapies capable of curing “untreatable”, multidrug-resistant *Ng* infections in women. Moreover, we have also expanded our studies to better define the interaction of human immunodeficiency virus (HIV)-1 with the cervical epithelium upon its immediate introduction into the lower female reproductive tract, how this may contribute to viral transmission, and how co-infection with *Ng* and HIV-1 results in synergistic infection/disease. None of these observations would have been possible to reveal with frequently used transformed/immortalized cell lines or animal models in that they either a) do not express these relevant receptors or b) have different signaling pathways. Presently, I hold three US and one WO patents for the prevention and treatment of diseases caused by the pathogenic *Neisseria*. A fifth patent application has progressed to the PCT/international phase of review. My research findings have all been published in the best journals in the field and are frequently highlighted, or featured, by editors. Collectively, this body of work has had a significant impact on our understanding of neisserial pathogen-host interactions as well as the fundamental biology governing the female uterine cervix.