Division of Bacterial, Parasitic and Allergenic Products

Jay E. Slater, MD

Director, DBPAP

17 March 2016

Division of Bacterial, Parasitic and Allergenic Products (DBPAP)

- Merger (1999) of
  - Division of Bacterial Products (DBP) and
  - Division of Allergenic Products and Parasitology (DAPP)
- Leadership
  - Drusilla Burns, PhD (Acting) 1999-2000
  - Richard Walker, PhD 2000-2008
  - Milan Blake, PhD 2008-2010
  - Jay Slater, MD 2010-present

Division of Bacterial, Parasitic and Allergenic Products (DBPAP)

Immediate Office of the Director
Jay E. Slater, MD – Director
Drusilla Burns, PhD – Deputy Director
8 FTE

Laboratory of Bacterial Polysaccharides
Willie Vann, PhD – Chief
Mustafa Akkoyunlu, MD, PhD
Margaret Bash, MD
Wei Wang, PhD
John Cipollo, PhD
Daron Freedberg, PhD
19 FTE, 9 ORISE

Laboratory of Respiratory and Special Pathogens
Michael Schmitt, PhD – Chief
Drusilla Burns, PhD
James Keller, PhD
Tod Merkel, PhD
18 FTE, 1 ORISE

Laboratory of Immunobiochemisty
Ron Rabin, M.D. – Chief
Jay E. Slater, MD
10 FTE, 7 ORISE

Laboratory of Mucosal Pathogens & Cellular Immunology
Scott Stibitz, Ph.D. – Chief
Paul Carlson, PhD
Siobhán Cowley, PhD
Karen Elkins, PhD
19 FTE, 6 ORISE

As of 1 February 2016

DBPAP regulatory/research portfolio

Non-invasive, toxin producers
- *Bacillus anthracis*
- *(Bordetella parapertussis)*
- *Bordetella pertussis*
- *(Clostridium botulinum)*
- *Clostridium tetani*
- *Corynebacterium diphtheriae*
- *(Clostridium difficile)*

Invasive, protective responses to polysaccharides
- *Haemophilus influenzae*
- *Neisseria meningitidis*
- *Streptococcus pneumoniae*

Intracellular
- *(Francisella tularensis)*
- *Mycobacterium tuberculosis*
- *(Mycobacterium bovis)*

Enteric
- *(Campylobacter jejuni)*
- *Salmonella typhi*
- *(Salmonella typhimurium)*
- *(Shigella dysenteriae)*

Parasite
- *(Plasmodium spp)*
- *(Leishmania donovani)*

Other/emerging
- *(Yersinia pestis)*
- *(Staphylococcus aureus)*
- Allergenic products
- (Probiotics)
- (Fecal microbiota)
- (Bacteriophage)

DBPAP regulatory/research portfolio
Bacterial Polysaccharides (LBP)

Non-invasive, toxin producers
- *Bacillus anthracis*
- *(Bordetella parapertussis)*
- *Bordetella pertussis*
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- *Corynebacterium diphtheriae*
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Invasive, protective responses to polysaccharides
- *Haemophilus influenzae*
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Bacterial polysaccharides (LBP)

- Akkoyunlu
  - Regulation of humoral immune response against polysaccharide vaccines by bacterial products
- Bash
  - To present protein targets as alternatives based on molecular epidemiology of the pathogen where polysaccharide vaccines have lacked success
- Cipollo
  - Mass spectrometry of carbohydrates as a tool for characterization of bacterial vaccines and pathogens
- Freedberg
  - Improvement of biological product quality by application of new technologies to characterize of vaccines and blood products: NMR spectroscopy and light scattering
- Vann
  - To detemine the metabolic pathway for the synthesis of polysaccharides in gram negative pathogens and to use this knowledge to development methods for preparing glycoconjugate vaccines using metabolic engineering
  - To improve and understand the manufacture of current conjugate vaccines through the investigation of conjugation chemistry
- Wang
  - To investigate the genetics of pathogenesis of gram negative bacteria. *M. catarrhalis* is a model organism for these studies.
  - To study the regulation of *M. catarrhalis* virulence gene expression and identify biomarkers for developing vaccine against *M. catarrhalis*.

DBPAP regulatory/research portfolio
Immunobiochemistry (LIB)

Non-invasive, toxin producers
- *Bacillus anthracis*
- *(Bordetella parapertussis)*
- *Bordetella pertussis*
- *(Clostridium botulinum)*
- *Clostridium tetani*
- *Corynebacterium diphtheriae*
- *(Clostridium difficile)*

Invasive, protective responses to polysaccharides
- *Haemophilus influenzae*
- *Neisseria meningitidis*
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DBPAP regulatory/research portfolio

Mucosal Pathogens and Cellular Immunology (LMPCI)

Non-invasive, toxin producers
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- *Corynebacterium diphtheriae*
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- Probiotics
- Fecal microbiota
- Bacteriophage

Mucosal Pathogens and Cellular Immunology (LMPCI)

- Stibitz
  - Molecular genetics of virulence and virulence-gene regulation in bacterial respiratory pathogens
- Elkins
  - Define mechanisms by which vaccine-induced immune T cells provide protection against intracellular bacteria, and thus establish practical immune correlates
- Cowley
  - Characterization of unique aspects of mucosal immune responses to intracellular pathogens.
- Carlson
  - Molecular aspects of *C difficile* pathogenesis
- Malaria program – collaboration with OBRR

DBPAP regulatory/research portfolio

Respiratory and Special Pathogens (LRSP)

Non-invasive, toxin producers

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- *Bordetella parapertussis*
- *Bordetella pertussis*
- *Clostridium botulinum*
- *Clostridium tetani*
- *Corynebacterium diphtheriae*
- *(Clostridium difficile)*

Invasive, protective responses to polysaccharides

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Respiratory and Special Pathogens (LRSP)

- Schmitt
  - Characterization of iron transport systems of *Corynebacterium diphtheriae*
  - Analysis of gene regulation in *C. diphtheriae*
- Burns
  - Bacterial toxin structure/function relationships
  - Study of host response to immunization with anthrax and *Staphylococcus aureus* vaccines
- Keller
  - Clostridial neurotoxin vaccine and antitoxin research
- Merkel
  - Development of animal aerosol challenge models for pertussis, anthrax and disease caused by *Staphylococcus aureus.*
  - Analysis of gene regulation in *Bordetella pertussis*

LIB presenters

- Ronald L. Rabin, MD, Lab Chief, Supervisory Medical Officer (PI)
- Philippa Hillyer, PhD, Staff Fellow
- Nikunj Sharma, PhD, Staff Fellow
- Jay E. Slater, MD, Supervisory Medical Officer (PI)