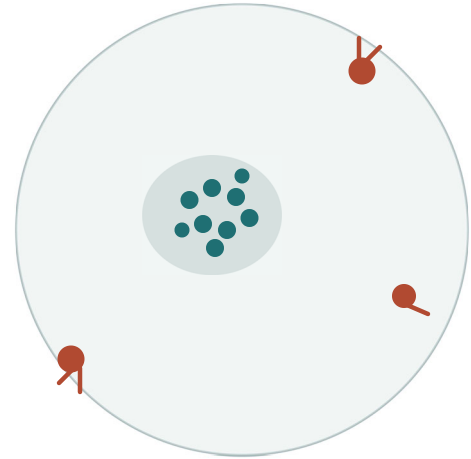


DEPARTMENTS OF UROLOGY & MICROBIOLOGY-IMMUNOLOGY • STONY
BROOK MEDICINE

Werneburg Laboratory

To understand, cure, and prevent human infection. A translational research program at the host-pathogen interface of urologic infection.

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OVERVIEW

Bench-to-bedside research in urologic infection

The Werneburg Laboratory investigates the host-pathogen interface in urologic infection, with a translational research program spanning bacterial pathogenesis, the urinary microbiome, catheter biofilm, and bladder physiology. Our work connects fundamental microbiology and immunology to clinical problems that are among the most common and costly in medicine: urinary tract infections (UTIs), recurrent UTI, and catheter-associated UTI (CAUTI).

While our focus is on urologic infection, the mechanisms and perspective gained translate to infection across medicine. Close interdisciplinary collaborations allow for seamless cross-talk and discovery generation that span across disciplines.

Every basic science question is motivated by a clinical problem with a clear path to patient impact.

RESEARCH FOCUS

Three connected lines of inquiry

IBC • UPEC Reservoir

Intracellular bacterial communities

Organized bacterial reservoirs that form within host cells and are increasingly linked to recurrent infection. We study how they form and how they might be diagnosed and treated.

Biofilm • CAUTI

Catheter & device biofilm

Indwelling catheters affect millions of hospitalized patients each year, and biofilm-driven infection is a major source of harm. We study biofilm on clinical devices and are building a specimen repository to track it over time.

Microbiome • AI

Urinary microbiome & bladder physiology

We study the urinary microbiome in relation to lower urinary tract symptoms, urgency, and recurrent UTI, and are developing computational tools applied to clinical microbiology data.

ROTATION & THESIS OPPORTUNITIES

Potential thesis projects

IBC • 01

IBC biology

Study of intracellular bacterial communities, with an eye toward diagnostic and therapeutic applications.

BIO • 02

Catheter biofilm & CAUTI

Characterizing biofilm on explanted clinical devices and linking device-level findings to patient outcomes.

MIC • 03

Urinary microbiome & LUTS

Cohort-based work relating the urinary microbiome to urgency subtypes and treatment response.

AI • 04

Antibiogram AI & antimicrobial stewardship

Applying computational methods to clinical microbiology data to support antimicrobial stewardship. Suited to a student with quantitative interests; a cross-disciplinary collaboration with Applied Mathematics & Statistics.

Bladder & upper urinary tract pressure physiology

Investigating pressure dynamics in the urinary tract, with relevance to neurogenic bladder, obstruction, reflux, and LUTS. A good fit for students interested in functional urology or urodynamics.

TRAINING IN THE LAB

Trained at the bench, oriented to the clinic

Our program is explicitly translational: every basic science question is motivated by a clinical problem with a clear path to patient impact. The department provides direct access to a high-volume clinical urology practice, supporting seamless bench-to-bedside integration. Students will find a scientifically rigorous environment with strong mentorship and multiple fundable project directions.

Bacterial genetics

Imaging

Mouse models

Clinical specimen processing

Bioinformatics

IRB-governed human subjects research

ROTATIONS

Interested in rotating with the lab?

Contact Dr. Werneburg directly to discuss rotation opportunities and current project availability.

Email Dr. Werneburg

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