Myddelton Parker

Roche Award

Ph.D. Student, Biomedical Engineering

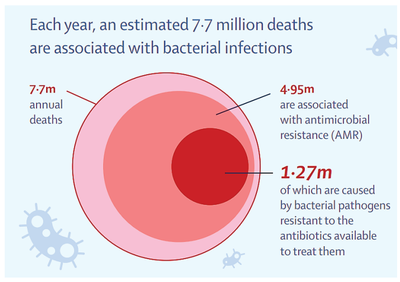
Second Year ARCS Scholar

UNIVERSITY OF GEORGIA

Dual Action Defense: Engineering NO-Releasing Ciprofloxacin-SNAP Catheters: *In Vivo* 14-day Infectious Model

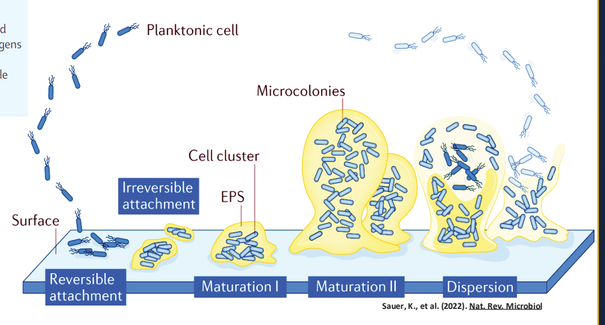
The dual-action antibiotic-NO heightens the efficacy of the proposed treatment, while slowing the development of antibiotic resistance. By modifying antibiotics to release nitric oxide, we are synthesizing a dual-action, broad-spectrum antimicrobial solution that can revolutionize the field of antibiotics, reducing the effect of antimicrobial resistance.

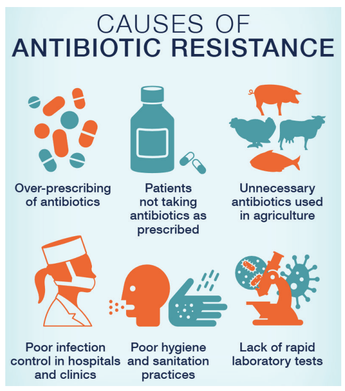
Antimicrobial Resistance and Biofilm Prevalence & Life Cycle



80% Of all known infections involve biofilms

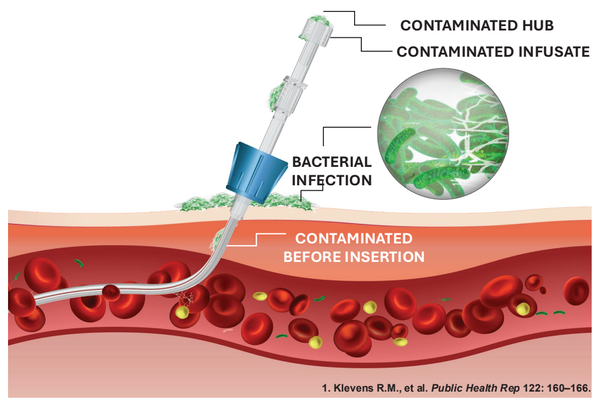
Antibiotics are not effective against complex forms of bacteria – *biofilms* – attributing to resistance





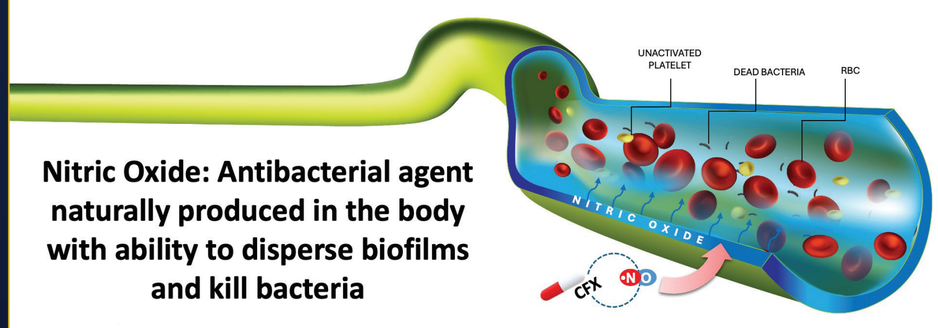
Hospital acquired infections and medical devices are common places for biofilm growth

Catheter-associated UTIs affect 449,334 patients per year in the US.[1]



1. Klevens R.M., et al. *Public Health Rep* 122: 160–166.

Nitric Oxide (NO) to the Rescue



Nitric Oxide: Antibacterial agent naturally produced in the body with ability to disperse biofilms and kill bacteria

Vision for Hemocompatible & Antibacterial Surface

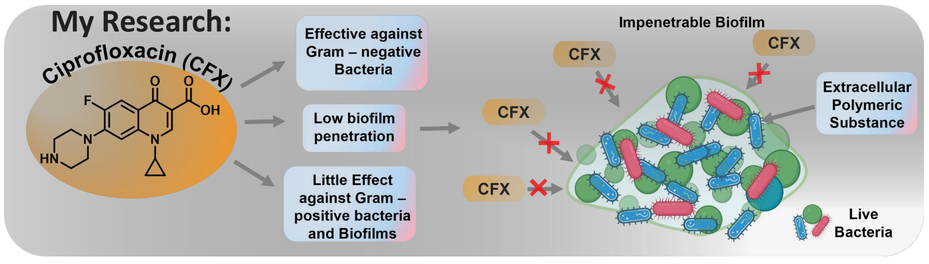
Antibiotics Modified with Nitric Oxide

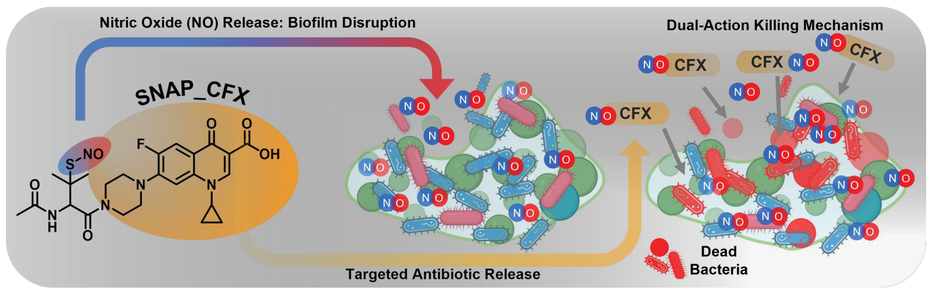
Antibiotics
- Cannot penetrate the biofilm alone, reducing the effectiveness

Antibiotics + NO
- NO can **break up the biofilm**, exposing the bacteria to the surroundings, increasing the susceptibility to conventional antibiotics

By conjugating a NO-donor to antibiotics, a dual-action biocidal solution is formed

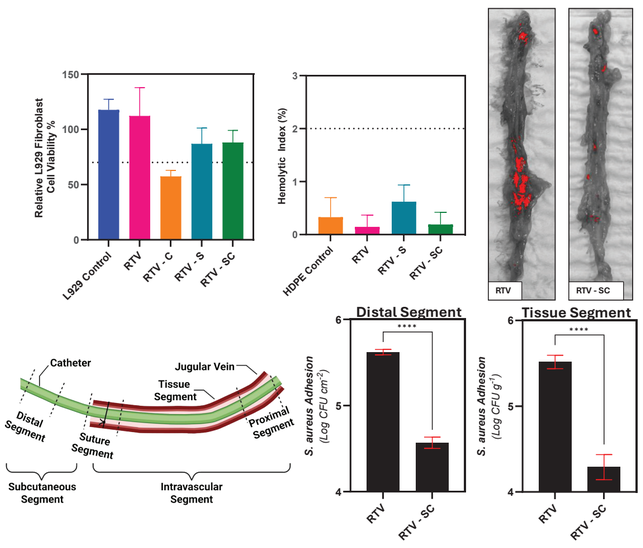
My Research:





Current Work

- Biocompatible
- 14 d NO Release
- Reduce blood clot and bacterial adhesion in 14 d Rabbit Model



Scholar Awards Celebration

November 12, 2025

SCHOLAR AWARDS CELEBRATION ARCS FOUNDATION ATLANTA

Igniting Innovation in Georgia