



2025 Special Seminar on The IDEC Institute

Mechanism Guided Development of Next-Generation
Antitubercular Drugs

Abstract



Tuberculosis (TB) remains one of the world's deadliest infectious diseases, with treatment challenged by lengthy regimens and the rise of drug resistance. A key component of current therapy is pyrazinamide (PZA), a drug uniquely capable of targeting nongrowing populations of *Mycobacterium tuberculosis* by disrupting coenzyme A metabolism. Yet, PZA's action is conditional—requiring host stress factors such as low pH—and resistance to the drug is increasing worldwide. In this seminar, Dr. Anthony Baughn, Professor of Microbiology & Immunology at the University of Minnesota Medical School and Director of the UMN Biosafety Level 3 Program, will present recent work on the mechanism of action of morphazinaide (MZA), a next-generation PZA analog. Unlike PZA, MZA displays robust bactericidal activity without the need for potentiation by environmental stress and retains potency against PZA-resistant strains. Dr. Baughn and colleagues discovered that MZA operates through a dual-action mechanism: disruption of coenzyme A metabolism, like PZA, coupled with an unexpected aldehyde-dependent activity that enhances killing and raises the barrier to resistance. This dual self-potentiating mechanism highlights new opportunities for drug discovery aimed at overcoming the growing challenge of drug-resistant TB. Beyond detailing the discovery process, Dr. Baughn will discuss how these findings may guide the rational design of improved therapeutic agents that exploit metabolic vulnerabilities of *M. tuberculosis*.



Presenter

Dr. Anthony Baughn

Professor

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Date

Online

2025 **11/18**

Tuesday

16:00 ▶ 17:00

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Venue

Hiroshima University, Graduate
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Matter Build A, 6F Seminar
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