

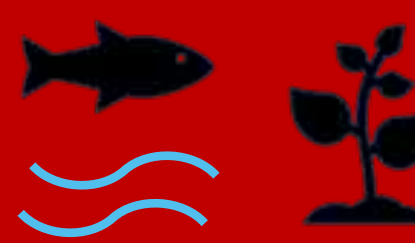

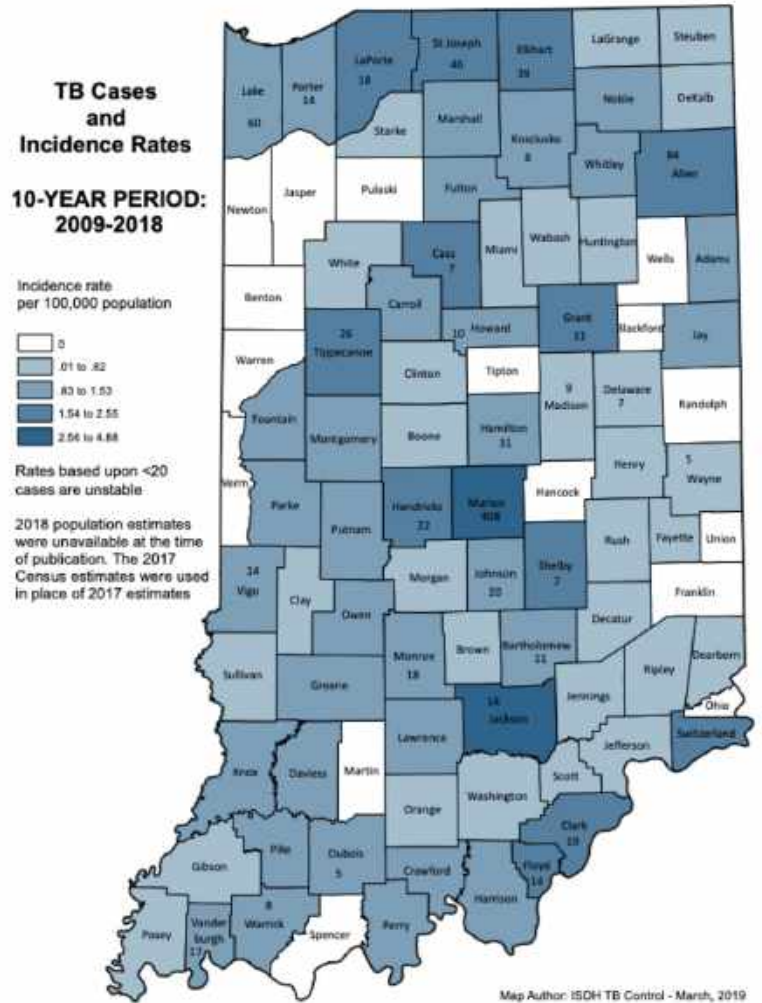
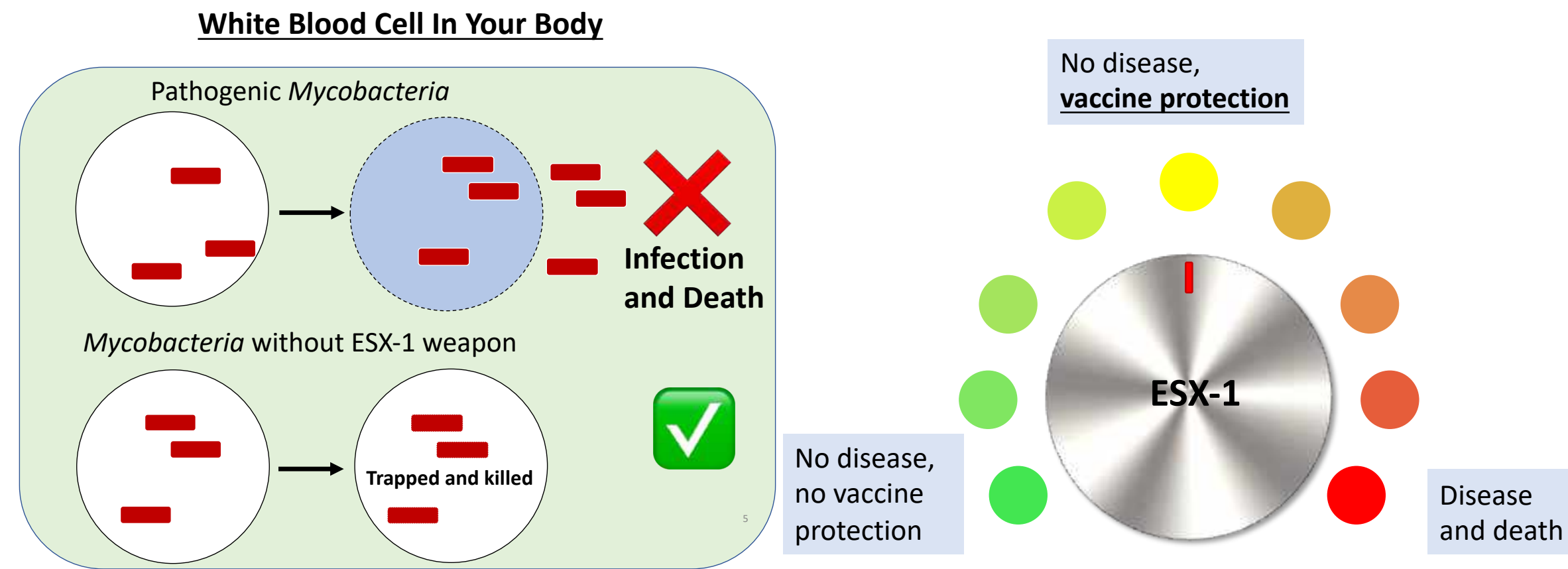


Turning Down the Dial on Tuberculosis and Non-tuberculous Mycobacteria

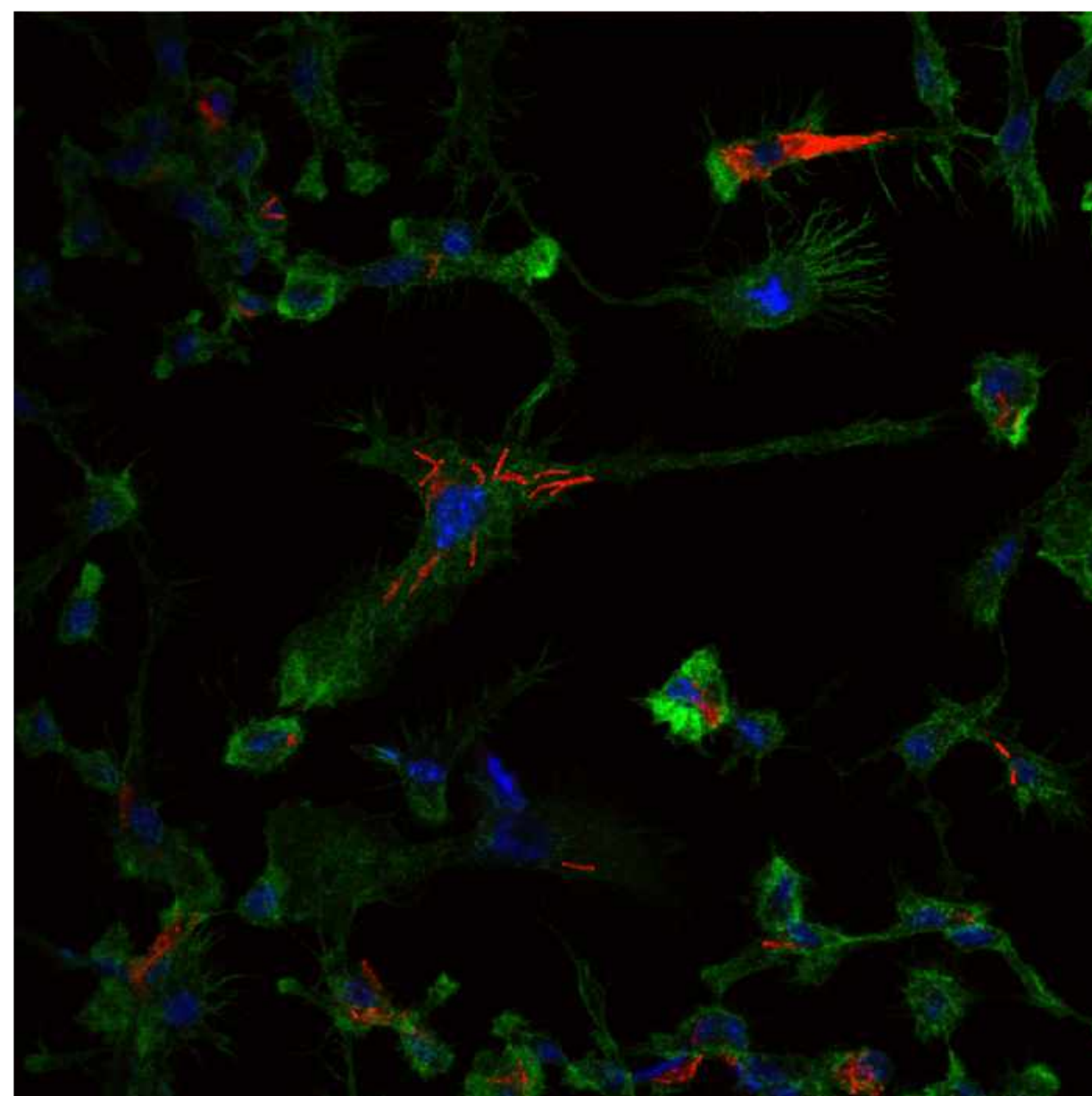
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<h2>TB</h2> <p>#1 infectious disease killer globally</p> 	<p>No country has ever eliminated</p>  <p>All 50 states report cases annually</p>	<h2>NTM</h2> <p>Found in water and soil</p> 	<p>Increasing incidence</p> <p>Hard to diagnose and treat</p> 
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- Non-tuberculous Mycobacteria (NTM's)**
- Everyone inhales them, but only a small fraction of people get disease, unclear why.
 - NTM's are not contagious, unlike TB.
 - Increasing rate of infection 10% each year since 2008, especially in **women and people over 65**.
 - People with COPD, cystic fibrosis and individuals who are **immunocompromised**, or undergoing **cancer treatment** are most at risk.
 - Indiana has a high prevalence and low screening rate for NTM infections

We study how tuberculosis and NTM bacteria infect your body. These bacteria have **a special weapons system called ESX-1** that they use to survive and escape your white blood cells during infection.



Doctors and scientists previously thought that the bacteria could turn this weapon on and off like a light switch.

However, my research has shown that it is more like a **dial**: you can tune it up or down, and there are varying degrees of virulence.

My lab has found two components that **turn down the bacteria's ability to infect us**.

This is useful information for **drugs and vaccines** against NTM's and tuberculosis.

Left: A Confocal Microscopy Image of Pathogenic *Mycobacteria* inside a white blood cell

Tuberculosis is the #1 infectious disease killer globally

- Highly contagious
- passed from person to person by cough
- Most Americans are not vaccinated against tuberculosis
- TB is rapidly gaining resistance to antibiotics.
- All 50 states continue to report cases of tuberculosis each year, and there were **116 new cases of TB in Indiana in 2018, two of which were resistant to antibiotics**.

