

## Lecture: Metchnikoff

**Alive from:**

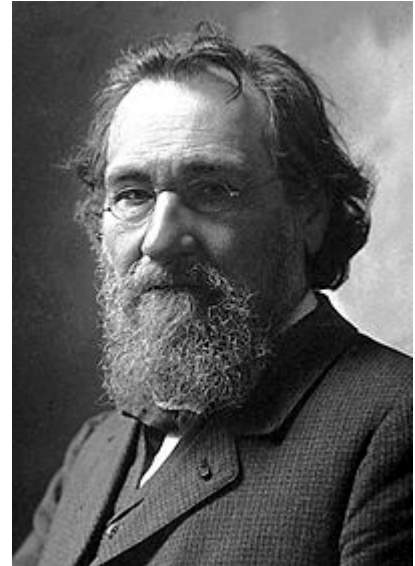
**Country of Origin:**

**Education/Training:** PhD. biologist, naturalist

**Employment:**

**Contributions/Accomplishments:**

- discovered white blood cells (phagocytes) in marine creatures like starfish
- these white blood cells engulfed and destroyed bacteria
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- worked with syphilis and determined that calomel ( ) was useful for treating/curing early stage of infection
- he came to believe that intestinal bacteria were the cause of ageing and degenerative diseases associated with ageing. He began drinking large quantities of sour milk.
- he believed lactic acid was beneficial. He still died at age 71! This work did help lead the way to the study of probiotics and intestinal health.



**Reaction/Response/Controversy:**

- apparently he suffered from depression or bipolar disorder, he attempted suicide multiple times
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- the belief that phagocytes ( ) were responsible for immunity not accepted by all. Emil Behring believed that the "blood" was responsible for immunity not phagocytes. In fact, Behring believed that phagocytes help spread the pathogens throughout the body.
- both Metchnikoff and Behring were arrogant and believed so strongly in their respective positions, that they fought for years.
- if they had been less arrogant and more cooperative, they would have realized that they were both correct, then they could have developed a more comprehensive theory of immunity
- infected human volunteer with syphilis to test effectiveness of calomel ointment

## Lecture: Ehrlich

**Alive from:**

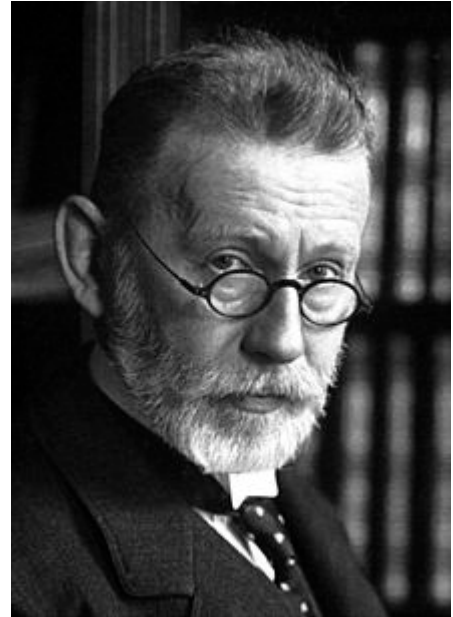
**Country of Origin:**

**Education/Training:**

**Employment:** physician/professor

**Contributions/Accomplishments:**

- believed in “magic bullet” to kill microbes ( )
- developed arsenic drug to treat syphilis – preparation #606 - \_\_\_\_\_
- developed and used many stains and techniques to see microbes and tissues
- he hoped to create/find a stain that would kill microbes but leave human tissue alone ( )
- he got infected with tuberculosis but survived
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- “side-chain theory” – Ehrlich believed that cells had side-chains ( ) that could bind to toxins/pathogens and this was the cause of immunity. These side-chains could break off and float thru bloodstream/body ( ).
- won a Nobel Prize for work on immunity



**Reaction/Response/Controversy:**

- Koch developed an alleged cure for TB ( ) he allegedly wanted to profit from it (Ehrlich supported Koch)
- tuberculin was not a cure and may have activated dormant TB in patients which killed them
- tuberculin is an extract of the TB bacteria that is used to determine infection with TB
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- fear that Salvarsan would degrade sexual morals – increase in sexual activity for unmarried people and increase in infidelity of married people
- tested “cures” on people without sufficient animal testing

## **Study Objectives**

- 1. Know where Metchnikoff and Ehrlich were born.**
- 2. Describe the scientific training, if any, possessed by Metchnikoff and Erlich.**
- 3. Describe the importance of Metchnikoff's discovery of white blood cells.**
- 4. Describe the controversies surrounding Metchnikoff's life and research.**
- 5. Describe Ehrlich's "magic bullet" theory.**
- 6. Describe Ehrlich's "side-chain theory.**
- 7. What is preparation #606 (Salvarsan) used for?**
- 8. Describe the controversies surrounding Ehrlich's research.**