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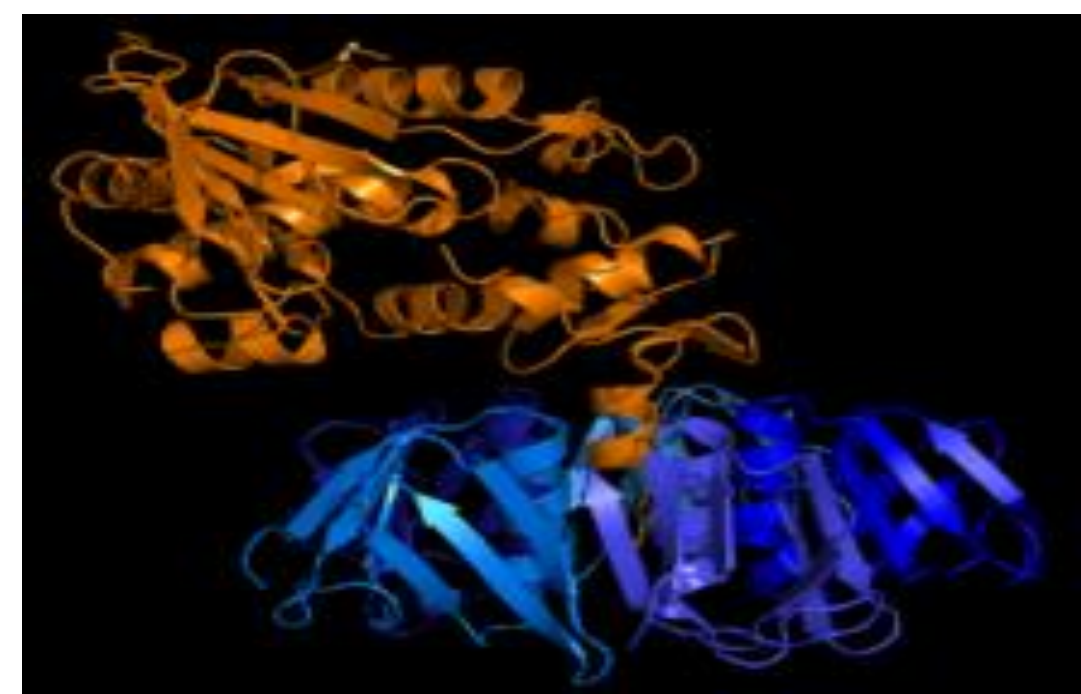


# What is Dysentery?

By: Rory Malek and Zach Hutchens

## Bacterial Dysentery

Dysentery is a disease that affects the digestive system and has many grotesque symptoms, such as diarrhea and vomiting. Dysentery is considered more of a set of symptoms instead of an actual organism, but it is almost always caused by a bacterium.



*The Shiga toxin, the leading cause of dysentery, is shown to the left.*

It is important to understand this disease because everyone will likely get it one day. The bacterium can be found in undercooked food and any defecation, and it is hard to detect without anyone falling ill. However, once symptoms appear, they can worsen quickly, as many of the bacteria causing dysentery are gram-negative and continually release more of the toxin throughout their life cycle.

### The History: Past and Present

Historically, this sickness was infamous. Dysentery caused 90% of all deaths in 19<sup>th</sup> century Sweden (University of Gothenburg, 2012) and recently caused 1000 German citizens to fall ill. Many Third World countries struggle with it, as there is not much hygiene or clean water in those areas of the world. This disease is not rare; it is widespread.

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## The Disease

Before dysentery can first infect a person, it must go through the three lines of defense of the immune system. The first line of defense, the skin, keeps the bacteria out of the body. The second line of defense, white blood cells, often kill very little bacteria because they hide in ingested food. That leads to the third line of defense: T and B cells. The immune system can easily kill the bacteria, but the poison will still remain until flushed out (Kid's Health, 2010).



*Escherichia coli under an electron microscope, shown to the left.*

## Prognosis

Dysentery is not a chronic disease, nor fatal if properly treated. Dysentery lasts for approximately one week and can easily be treated (New World Encyclopedia, 2008). In countries with a poor water supply, however, dysentery is a leading cause of death because of dehydration or blood loss. If given a plentiful clean water supply, though, a person might not even have to be hospitalized. Do not become irrational and underestimate this disease, though. The symptoms may seem somewhat harmless, but if the disease worsens, nausea could turn into bloody diarrhea and worse.

## Treatments

There are two options for treatment and both of them are effective. One option is very simple: drink many fluids and endure the misery. The second option is the introduction of antibiotics, which are actually considered emerging treatments and work effectively. The first treatment has very simple mechanics. The reason dysentery can be deadly is because of dehydration, so drinking fluids will immediately eliminate any chance of a fatality. The second option is more difficult to understand. Drugs, such as ciprofloxacin and loperamide (which are considered emerging treatment options and have been tested by the World Health Organization, have led to a relief of symptoms in 19 hours, compared to the previous 10 day recovery (WHO, 2012)!

*The drug ciprofloxacin is shown to the right.*



### How the Medication Works

These medications allegedly enter bacteria and inhibit an enzyme called DNA gyrase. This inhibitor prevents the multiplication of bacteria, allowing the immune system to destroy bacteria without them replicating (Medline, 2015). Other than the mentioned medications, there are no other emerging treatment options.

References available upon request.