

Microbe on escherichia coli - lab report example

[Science](#), [Biology](#)



Microbe on Escherichia coli

Part I: Organism Information Organism Escherichia coli Organism Type:

Bacteria Organism Structure: E. coli is a gram-negative bacterium with rod shaped cells 2.0 (μm) long with a diameter of 0.5 (μm). The bacterium grows best at 37°C but some strains have successfully multiplied in controlled laboratory settings at even 49°C. It is a facultative anaerobe reproducing using mixed-acid fermentation requiring low hydrogen levels to ferment simple sugars into formic acids. E. coli is also found with other hydrogen consuming organisms like sulphate-reducing bacteria (Hayhurst, 2004).

Organism Characteristics: The bacterium is usually found in the lower intestinal tract of warm-blooded animals and humans. Most of the strains found in the gut are actually beneficial to the host by inhibiting the growth of other harmful bacteria and synthesizing vitamins, like K2. However, some serotypes can cause severe food poisoning in humans. One common strain, O157: H7, releases strong toxins, specifically enterotoxins, that damage and infect the host's intestinal lining (Rasko, 2011). At times, a small colony of only 10-100 cells is enough to cause infections in children. The incubation period of these types of infection causing strains can range anywhere from a few hours to a week. The bacteria penetrate and thrive in the intestinal lining, eating away at the mucosa (Hayhurst, 2004).

Part II: Disease Information

Diseases caused: Food poisoning

Mode of Transmission: Usually through fecal-oral transmission and coming in contact with contaminated foods and drinks

Portal of Entry into body: Main route through oral ingestion

Area of body organism attacks: Mucous lining of the intestines

Symptoms of Disease: Symptoms usually manifest themselves in adults after 3-4 days of being infected consisting mostly of mild diarrhea, abdominal cramping and nausea. In severe cases the diarrhea can become bloody and the infection can cause kidney problems leading to pale skin, fever, chills, and bruising. Most healthy adults get better within a week while for infants and young children it can take longer. In rare and extreme cases the virulent strain can also cause pneumonia, hemolytic uremic syndrome (kidney failure), and dehydration through diarrhea, eventually leading to death in young children and older adults (Hayhurst, 2004).

Part III: Treatment and Prevention

Diagnosis: Usually the doctor carries out a physical examination and a medical history involving a series of questions about many of the symptoms. The questions will also try to determine travelling history, recently eaten foods, contact with contaminated foods and unpasteurized dairy products, and antibiotic use. The physical examination consists of checking the patient's temperature, blood pressure, skin color, stomach tenderness and a rectal exam. If E. coli infection is suspected, the doctor will request a stool culture examination to determine the presence of the infectious strain and its toxins (Rasko, 2011).

Treatment: There aren't any medications and vaccines yet to protect against E. coli infections. One of the best methods to relieve symptoms is to get plenty of rest and fluids in order to decrease dehydration due to diarrhea. If bloody diarrhea occurs, diarrhea medicine and antibiotics should be avoided

as these slow the digestive system, allowing even more of the poison produced by the bacteria to be absorbed. In extreme cases where kidney failure or blood problems occur, blood transfusion and dialysis will be needed (Hayhurst, 2004).

Prevention: The primary way to prevent infections is to limit the exposure to contaminated foods and water, unpasteurized dairy products, and avoiding cross-contamination. Meats should be cooked thoroughly at high temperatures and raw fruits and vegetables should be washed before use. Hands should be washed before and after preparing food, using the washroom and coming into contact with animals. When travelling, it is best to avoid ice and tap water (Hayhurst, 2004).

Part IV: Historical information

1885: Theodor Escherich, a German pediatrician, discovered E. coli and named it Bacterium coli commune because it was found in the colon of healthy adults (Hayhurst, 2004).

1917: Nissle, a nonpathogenic strain of E. coli, started being used in medicine to treat many gastroenterological diseases like, inflammatory bowel disease (Hayhurst, 2004).

1997: The DNA sequence of E. coli was first completed and published. The circular DNA was found to have 4.6 billion base pairs and a very high coding density (Hayhurst, 2004).

2011: An outbreak of the strain O104: H4 began in Germany leading many people to be infected with hemolytic-uremic syndrome. Gradually 11 other countries were affected including some parts of North America. Later that year, the Federal Institute for Risk Assessment in Germany announced that

fenugreek seeds from Egypt were the likely cause of the outbreak (Rasko, 2011).

Part V: Works Cited

Hayhurst, Chris. (2004). Epidemics, Deadly Diseases Throughout History: E. coli. New York, NY: The Rosen Publishing Group, Inc.

Rasko, D. A., et al. (2011). Origins of the E. coli Strain Causing an Outbreak of Hemolytic-Uremic Syndrome in Germany. The New England Journal of Medicine, 365, 709-717. Retrieved from [http://www. nejm. org/doi/full/10.1056/NEJMoa1106920](http://www.nejm.org/doi/full/10.1056/NEJMoa1106920)