

Bacteria Identification Virtual Lab

http://www.hhmi.org/biointeractive/vlabs/bacterial_id/index.html

Basic Steps

- Prepare a sample from a patient and isolate whole bacterial DNA.
- Make many copies of the desired piece of DNA.
- Sequence the DNA.
- Analyze the sequence and identify the bacteria.

The piece of DNA used for identifying bacteria is the region that codes for a small subunit of the ribosomal RNA (16S rRNA). We will refer to this piece as 16S rDNA. Different bacterial species have unique 16S rDNA sequences. The identification relies on matching the sequence from your sample against a database of all known 16S rDNA sequences.

Learning Objectives

- What kind of patient samples are used for the purpose of identifying possible pathogens?
- What does PCR do, how does it work, and why is it useful?
- How do you separate the desired DNA from all others?
- How does an automatic DNA sequencer work?
- Why is it possible to use a DNA sequence to identify bacteria?

Identify Each Sample

Samples from different patients. Click the sample links on the website to identify the bacteria.

- **Sample A - Fluid from Lymph Node**
This sample was obtained from tissue and fluid aspirated from a lymph node of a patient complaining of a fever, fatigue, and swollen lymph glands.
- **Sample B - Stool Sample**
This sample was obtained from the stool of a patient with a normal temperature complaining of severe abdominal cramps and watery diarrhea.
- **Sample C - Urine Sample**
This sample was obtained from the urine of a patient complaining of pain during urination and a discharge from the urethra.
- **Sample D - Blood Sample**
This sample was obtained from the blood of a patient complaining of fever, headache, joint pain, constipation, loss of appetite, and abdominal pain.
- **Sample E - Sputum Sample**
This sample was obtained from the sputum of a patient complaining of chills, high fever, a cough with labored breathing and sputum with flecks of blood.
- **Sample F - Stool Sample**
This sample was obtained from the stool of a child who has fever, abdominal pain, and bloody diarrhea.