TAGGING A MICROBE

Background

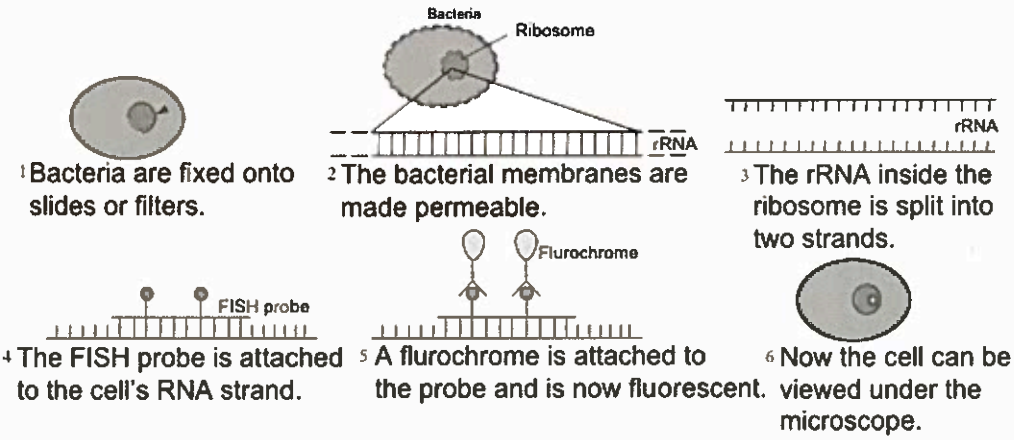
Microbes are too small to see with the naked eye, but they are everywhere: in your body, on your chair, hanging out in forests, and even in the ocean. There are millions of different kinds and each kind has its own story to tell. One of the missions of the *JOIDES Resolution* (JR) and her scientists is to study microbes, in this case bacteria, living in hard to reach places below the ocean floor. By doing so, they hope to better understand the role microbes play in the food web, how they influence Earth's geochemical cycles and climate, and even learn more about the origins of life.

Scientists can learn about microbes by studying their genetic material (DNA and RNA). This activity will help you understand one such method, called **Fluorescence In-Situ Hybridization** or **FISH**. The process helps microbiologists who work on the JR investigate two big questions:

1) What types of bacteria are living below the seafloor?
2) How abundant is each type of bacteria?

The FISH process

On the ship, scientists take rock and sediment samples from the cores that come up from the ocean floor. The samples are placed in a freezer to preserve them. When ready, the microbiologists use FISH to "tag" microbes with a probe and fluorescent dye called fluorescent flurochrome. The flurochrome attaches to the ribosomal RNA (rRNA) in the bacteria of interest. When viewed under a special microscope the bacteria that have been "tagged" light up. Different colored fluorescent tags are used to identify different types of bacteria.



The microbes in this image are living on a basaltic rock taken from the ocean floor. The bright spots are microbes tagged with the FISH probe. The lighter spots are other types of bacteria. From this data, the scientists were able to distinguish between two different types in situ (in the environment) without destroying their habitat.
Turner, A., Unpubl.data