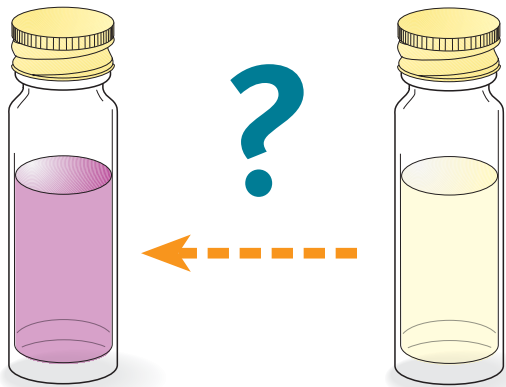


Microbial messaging

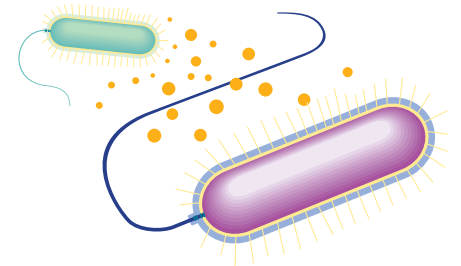
There is evidence that some bacteria have a 'language' all of their own. It looks as though certain bacteria send chemical signals to tell each other when to start causing disease or when to make useful products (such as antibiotics). If we could understand this bacterial signalling system perhaps we could block it, to help prevent disease. Or maybe we could use similar chemical signals ourselves to boost the production of medicines by 'friendly' bacteria. Here you will investigate whether one type of bacterium can encourage another to make a purple dye.

Grow them for a few days, and these bacteria make a bright purple dye.



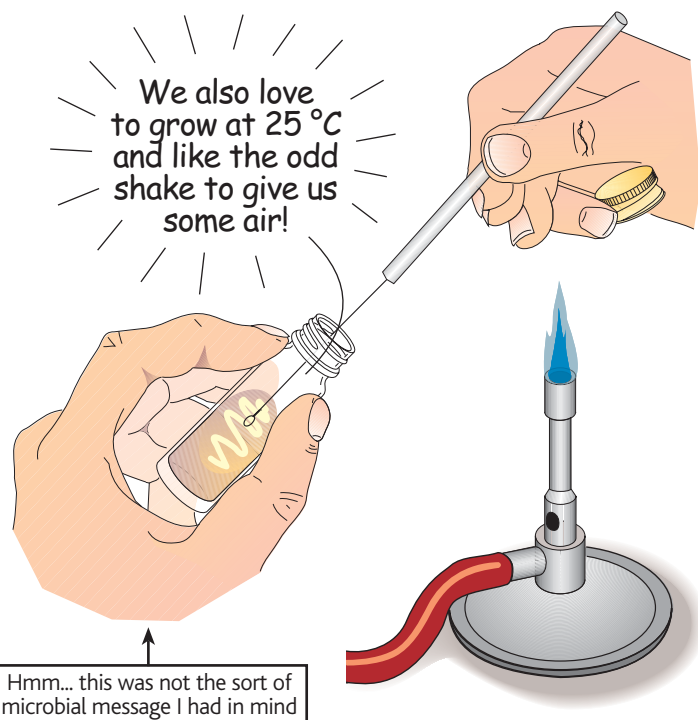
But do these other bacteria send messages that switch on dye production sooner?

Plan an investigation to find out whether the two species of bacteria can communicate with each other...



... and what effect these signals (if there are any) have.

You can grow mixtures of the two bacteria in the same nutrient broth.



In your investigation, how can you test that:

- the second type of bacteria don't turn dark purple too (adding to the colour of the first type)?
- the nutrient broth doesn't go purple by itself? (well, you never know!)

Is there anything else you need to check?

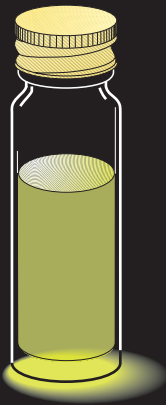
You'll need to use special techniques to stop unwanted bacteria getting into your mixture – and to stop the bacteria under investigation from getting out!

Your teacher will show you how to carry out these techniques safely.

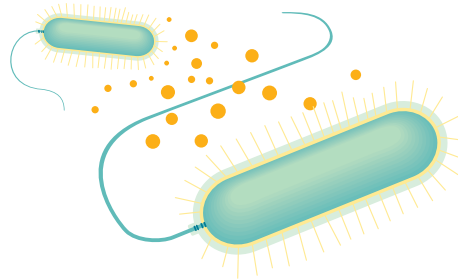
Neighbours with attitude

Many different types of bacteria glow in the dark. Those that live in the sea are especially interesting, because when they're just floating about they don't make light. It's only when they gather together inside special pockets in certain fish and squid that they start to glow. In this comfortable environment, the bacteria send chemical signals to one another, triggering the reactions that generate light. Can these fishy bacteria be fooled into making light by completely different microbes that send similar chemical messages? Now's your chance to find out ...

These bacteria glow in the dark. To do this, they need a supply of nutrients and oxygen.

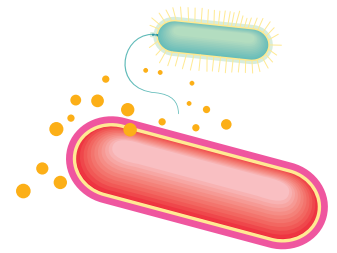


They also need to receive the correct number and type of chemical signals from neighbouring bacteria.



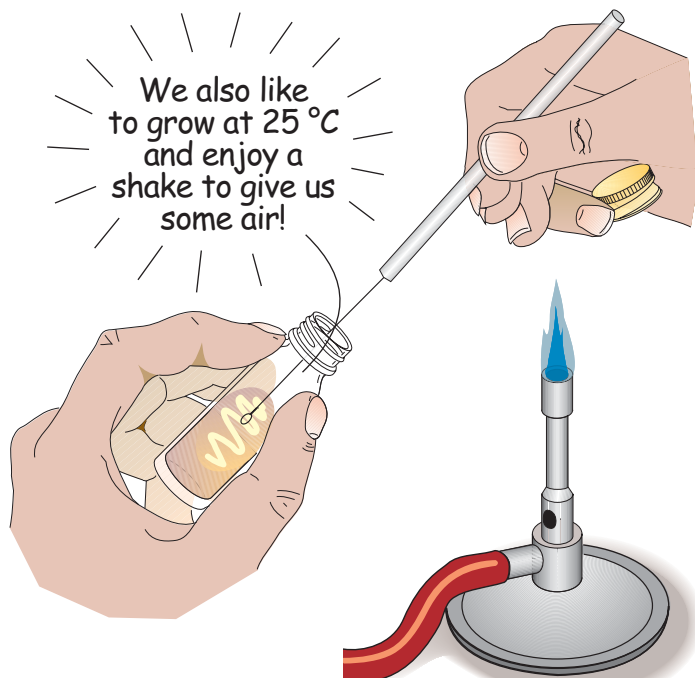
"Neighbours, everybody needs good neighbours..."

Normally, the bacteria only receive enough chemical signals after they've been growing for a while and there are plenty of the same bacteria around.



But perhaps they can be fooled by other bacteria!

You can grow mixtures of the two bacteria in the same nutrient broth.



In your investigation, how can you test that:

- the second type of bacteria don't glow as well?
- adding the second type of bacteria makes a difference to either the amount of light produced or the time it takes before light is produced?

Is there anything else you need to check?

You'll need to use special techniques to stop unwanted bacteria getting into your mixture – and to stop the bacteria under investigation from getting out!

Your teacher will show you how to carry out these techniques safely.