

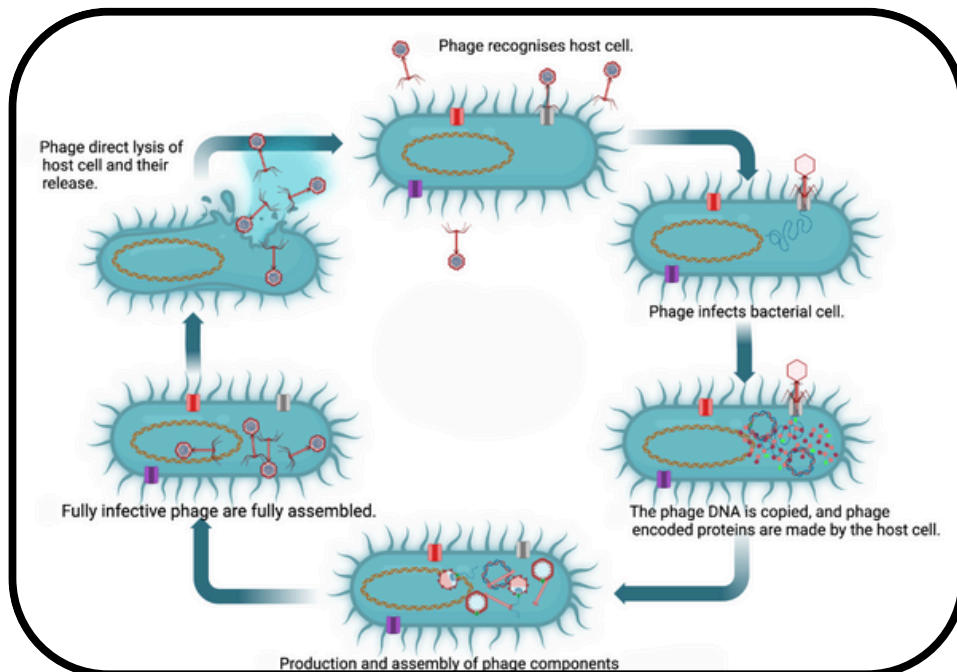
Information about phages

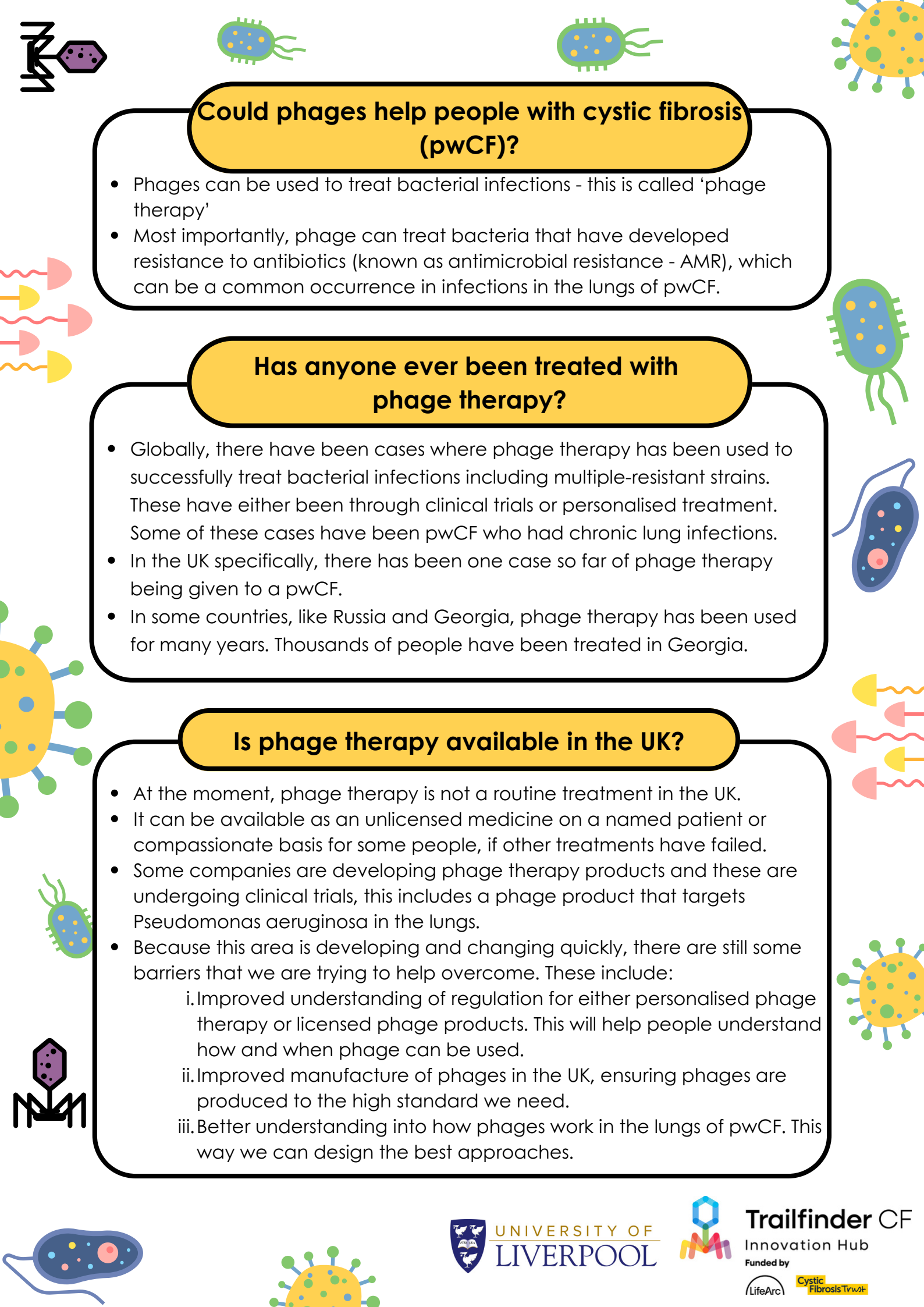
What are phages?

- Phages (also known as bacteriophages) are viruses that can infect and kill bacteria. They are the most common biological entity on Earth and are found in nearly all habitats where bacteria live.
- Phages are highly specific. There are billions of different phages in existence, but each specific type of phage will infect a specific type of bacteria.
- Phages infect bacterial cells; they do not infect human cells.

How do phages work?

- A phage recognises a specific bacterium and attaches itself to the surface
- The phage infects the bacterial cell by injecting its DNA into the cell
- The phage uses the bacterial cell's DNA replication machinery to make many copies of itself
- The phage then causes the bacteria to break open, killing the bacteria and releasing many more phages that will go on to infect and kill more bacteria





Could phages help people with cystic fibrosis (pwCF)?

- Phages can be used to treat bacterial infections - this is called 'phage therapy'
- Most importantly, phage can treat bacteria that have developed resistance to antibiotics (known as antimicrobial resistance - AMR), which can be a common occurrence in infections in the lungs of pwCF.

Has anyone ever been treated with phage therapy?

- Globally, there have been cases where phage therapy has been used to successfully treat bacterial infections including multiple-resistant strains. These have either been through clinical trials or personalised treatment. Some of these cases have been pwCF who had chronic lung infections.
- In the UK specifically, there has been one case so far of phage therapy being given to a pwCF.
- In some countries, like Russia and Georgia, phage therapy has been used for many years. Thousands of people have been treated in Georgia.

Is phage therapy available in the UK?

- At the moment, phage therapy is not a routine treatment in the UK.
- It can be available as an unlicensed medicine on a named patient or compassionate basis for some people, if other treatments have failed.
- Some companies are developing phage therapy products and these are undergoing clinical trials, this includes a phage product that targets *Pseudomonas aeruginosa* in the lungs.
- Because this area is developing and changing quickly, there are still some barriers that we are trying to help overcome. These include:
 - i. Improved understanding of regulation for either personalised phage therapy or licensed phage products. This will help people understand how and when phage can be used.
 - ii. Improved manufacture of phages in the UK, ensuring phages are produced to the high standard we need.
 - iii. Better understanding into how phages work in the lungs of pwCF. This way we can design the best approaches.