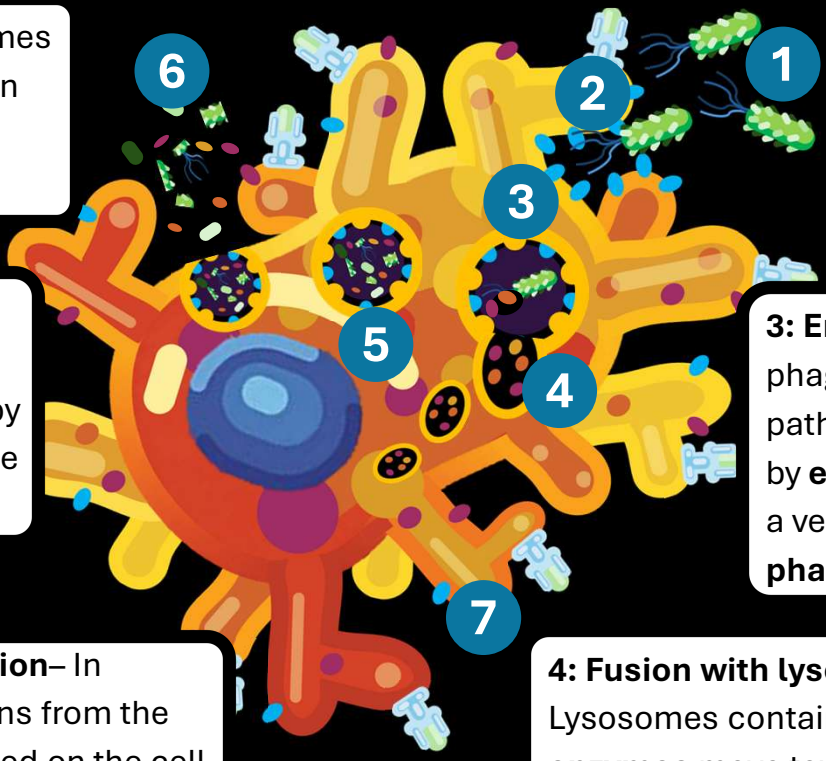
Phagocytosis

Phagocytosis is a non-specific immune response carried out by phagocytes such as neutrophils and macrophages. The phagocyte recognises pathogens, often aided by opsonins, and **engulfs** them by endocytosis to form a vesicle called a **phagosome**. Lysosomes then fuse with the phagosome, releasing hydrolytic enzymes that **digest the pathogen**. The useful products are absorbed, and in macrophages, antigens from the pathogen may be **presented on the cell surface** to activate the specific immune response.

1: Pathogen recognition – The phagocyte recognises the pathogen as foreign, often with the help of **opsonins** that bind to the pathogen and make it easier to detect.

2: Attachment – Receptors on the phagocyte's cell surface bind to molecules on the pathogen.

3: Engulfment – The phagocyte surrounds the pathogen and engulfs it by **endocytosis**, forming a vesicle called a **phagosome**.



4: Fusion with lysosomes – Lysosomes containing **hydrolytic enzymes** move towards and fuse with the phagosome to form a **phagolysosome**.

5: Digestion – The enzymes break down the pathogen into small, soluble molecules.

6: Absorption and removal – Useful products are absorbed by the phagocyte, and waste material is expelled.

7: Antigen Presentation– In macrophages, antigens from the pathogen are presented on the cell surface to activate the specific immune response.

Answer the questions below

What type of immune response is phagocytosis?

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What structure is formed when a pathogen is engulfed by a phagocyte?

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What is the role of lysosomes in phagocytosis?

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