Leggi attentamente il seguente brano e rispondi alle domande di comprensione.

VERSO IL CLIL

How to digest chips of wood

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Eating wood can be difficult, except for the organism which bears the melodic name *Barbulanympha ufalula*, a protist that lives in the intestine of an insect (the wood roach). This roach lives on and among dead logs, feeding on wood chips. Its digestive system breaks up the wood chips into protist-sized pieces, which are then engulfed and digested by *Barbulanympha*. Neither organism can survive without the other.

The unicellular protist is about 0,3 millimetres in diameter, barely visible to the unaided eye. At the top of its cell there are many flagella (some 13 000 in all) that enable it to move about within the insect's intestine. At the opposite end of the cell there is a «back door»: a sensitive region of the plasma membrane through which microscopic wood chips are brought into the cell. This process is known as phagocytosis, literally meaning «cell-eating».

When the sensitive portion of the plasma membrane makes contact with a wood piece in the roach's gut, the membrane extends around the wood chip, enclosing it in a vacuole. The vacuole then detaches from the plasma membrane and moves into the interior of the cell. Here, enzymes synthesized by the *Barbulanympha* can digest the cellulose in the wood into glucose and then into a smaller breakdown product (called acetate). Both digestive enzymes and acetate are exported out of the cell, back into the intestine of the wood roach. In the mitochondria of the insect's intestinal cells, the acetate is broken down into carbon dioxide and water. The energy released in this final stage of the process is harnessed to produce ATP.

All cells are equally dependent on their capacity to transport substances – ions, molecules, food particles, and even other cells – across the plasma membrane.

A How does a protist help the wood roach?

B Where is the energy harnessed?

The wood roach *Cryptocercus punctulatus* on a log.