

Exercise walk-through

8.4

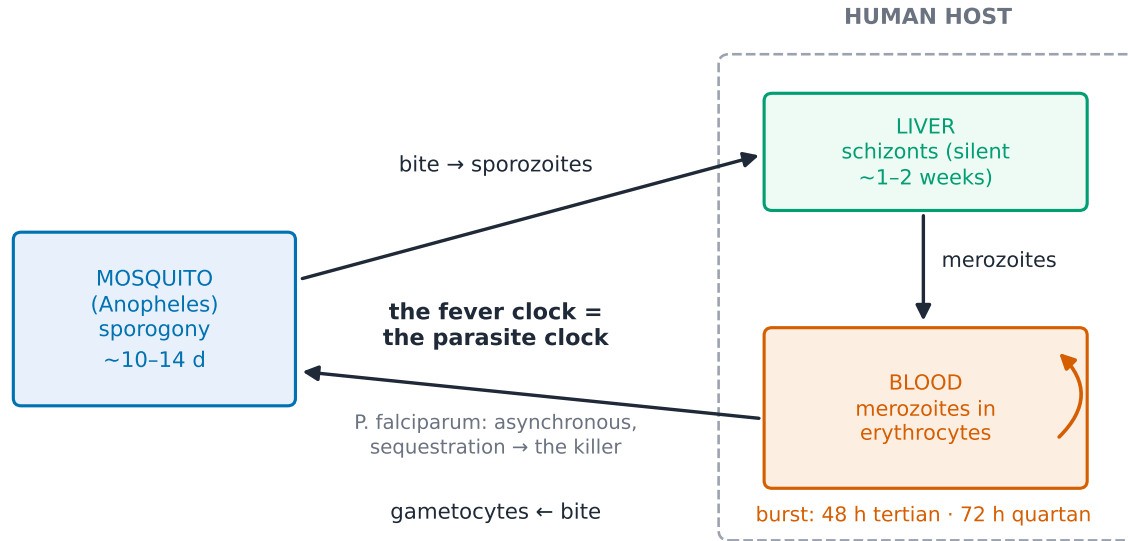
Fungi and parasites

University Medicine

Fungi and parasites: two hosts, one clock

- 1 **Dimorphism** Mould at 25 °C in the environment, yeast at 37 °C in tissue - the thermostat is the identity card.
- 2 **Malaria cycle** Sporozoites → liver schizonts → erythrocytic merozoites → gametocytes → next mosquito; synchronous bursting every 48 h (tertian) or 72 h (quartan).
- 3 **The exception** *P. falciparum*: asynchronous, sequestering - irregular fevers but the killer.

The malaria life cycle between mosquito and human



Liver stage, blood stage, **gametocyte** stage - each stage names a target.

Exercises 2.1·2.3

2.1 Which species pattern is quartan, and what is its period? [3]

2.2 A culture grows as a mould at 25 °C and a yeast at 37 °C – what is it, and what is the switch called? [3]

2.3 Which fungus follows neutrophil failure? [3]

Exercises 2.1-2.3

2.1 Which species pattern is quartan, and what is its period? [3]

2.1

- *P. malariae* – quartan, bursting every 72 h ✓.

2.2 A culture grows as a mould at 25 °C and a yeast at 37 °C – what is it, and what is the switch called? [3]

2.2

- A dimorphic fungus; the switch is thermal dimorphism ✓.

2.3 Which fungus follows neutrophil failure? [3]

2.3

- *Aspergillus* ✓.

Exercise 3.1

3.1 A fictional returned traveller: thick film shows ring forms in 3 % of erythrocytes plus crescent-shaped gametocytes.

Name the species (with the morphological evidence) and grade the parasitaemia. Explain why the fever chart is LESS regular than the textbook tertian pattern (poor synchrony) and why this species is the killer (cytoadherence/sequestration of infected cells). [8]

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- Crescent (banana) gametocytes → *P. falciparum* ✓.
- Parasitaemia 3 % of erythrocytes – graded from the film in one look ✓.
- Falciparum synchronises poorly → irregular fevers, not textbook tertian.
- Cytoadherence sequesters infected cells in deep vasculature → organ disease: the killer ✓.

Exercise 3.2

3.2 A fictional farmer's pneumonia after dust exposure: culture at 25 °C grows a mould; at 37 °C a yeast.

Explain the dimorphic switch as the organism's identity card (mould in the environment, yeast in tissue). Explain why knowing the environmental form matters for exposure questions and why the tissue form matters for diagnosis. [7]

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3.2

- 25 °C mould = environmental form; 37 °C yeast = tissue form ✓.
- The mould in soil/dust names the exposure route (inhalation of spores from disturbed environment).
- The yeast is what grows in the patient – diagnostics (culture at 37 °C, tissue forms) must target the tissue phase ✓.