



# A study in scarlet



- In a community, there are very young children with unusual levels of tiredness. Not the kind that resolves with rest, but persistent, daily exhaustion. But some are even finding it difficult to breathe.

This symptom is an important clue. It is common, non-specific, but important.

Unscramble the letters to identify it:

T G F A U I E

			○			○
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- To understand the symptom, you, a clinician-scientist, examine blood samples under a microscope. The red blood cells don't look typical. Instead of smooth, round shapes, many are irregular and crescent-like. These distorted cells could easily clog small vessels, reducing oxygen supply and explaining the previous condition.

What facility can you use to reveal this cellular detail?

Unjumble the letters identify the facility you need to access:

C M I R C O S P Y O

	○					○			
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- To pinpoint if there is a genetic cause behind these abnormal cells, you turn to sequence the DNA. It's large, complex, and not human-readable without specialized tools. You rely on computational pipelines to detect known mutations affecting red blood cells, a task beyond the previous technique alone.

You have to bridge biology and computation, and it's essential for modern diagnosis and research.

What facility can be used for this?

Unjumble the letters to reveal it:

O N I T R I C I B S A M F O

				○								○
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- You've traced the condition from symptom to investigation to deeper genetic insight.

What you're looking at is a disorder where red blood cells lose their normal shape and flexibility. Instead of being soft and round, they become stiff and crescent-shaped, making it difficult for them to flow through blood vessels.

This leads to poor oxygen delivery throughout the body, resulting in episodes of pain, frequent fatigue, and long-term damage to organs.

The condition is caused by a mutation in the gene that makes haemoglobin, the protein responsible for carrying oxygen in the blood. And, genetic mutations can be inherited. Understanding this disorder has required careful observation, lab work, and computational analysis of the underlying genetic changes.

The clues point to a single, well-known disease. Unjumble the circled letters in the last three clues to reach a diagnosis:

○	○	○	K	L	E
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C	○	L	L
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A	○	E	M	○	A
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