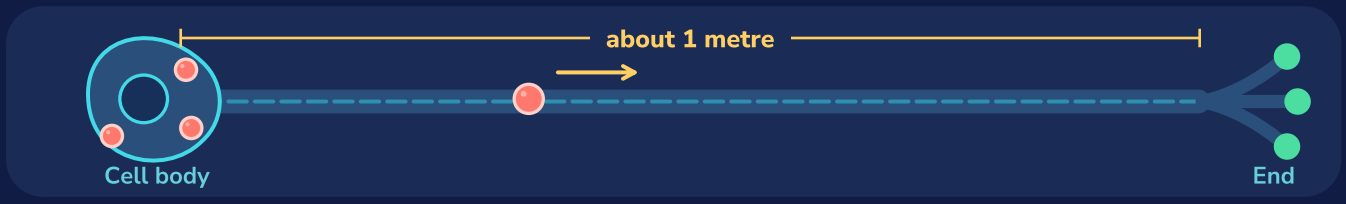
If its step were a metre long, it would walk at 360 km an hour.

A transport protein made by the cell carries loads step by step along a thin track.

DuaMio
DISCOVER

1 Problem: made in the body, needed at the end

Some nerve cells are about a metre long: a single cell, more than half your height.
Many loads are made in the cell body, but they are needed at the far end of the extension.



2 If it went on its own: centuries

It would spread on its own, like ink dripping into water. But if the road is twice as long, the wait is four times as long.



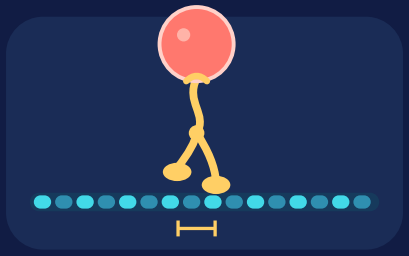
1 cm: about two weeks

1 m: centuries

A rough calculation for a protein, not a measured time.

3 Solution: a courier walking on a track

It swings its two ends forward in turn. Enlarge only its step, not its body, to a metre: at its lab pace of about 100 steps per second, that is about 360 km an hour.



Real step: about 8 nanometres

More than six thousand steps across a hair

1 metre: about 125 million steps

No single courier runs a marathon: in the lab a typical walk is about a hundred steps. Several couriers can hold one load; in one model the load changes hands along the way.

4 But not every load is in a hurry

Some sacs · about 5-40 cm a day

1 metre: a few days to a few weeks

Building blocks of the tracks and some skeleton threads · about 0.2-1 mm a day

1 metre: close to three years to more than ten

Calculated from speeds in animal studies.



The nerve cells in your cerebral cortex are largely the same age as you, but the parts inside them can be renewed.

The building stays the same; the furniture inside changes.

Every step of this small journey opens a door to reflecting on Allah's knowledge and power.

Discover, marvel, remember the Creator.

Sources: Milo & Phillips 2015 · Roy 2014 · Blasius 2013 · Yildiz 2004 · Bhardwaj 2006

www.duamio.com

Math: 100 steps/s × 1 m = 360 km/h; 1 m ÷ 8 nm = 125 million.
Drawings are illustrative, not to scale.