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Opening extract from

Biology

Written by and illustrated by

Dan Green and Simon Basher

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Cell

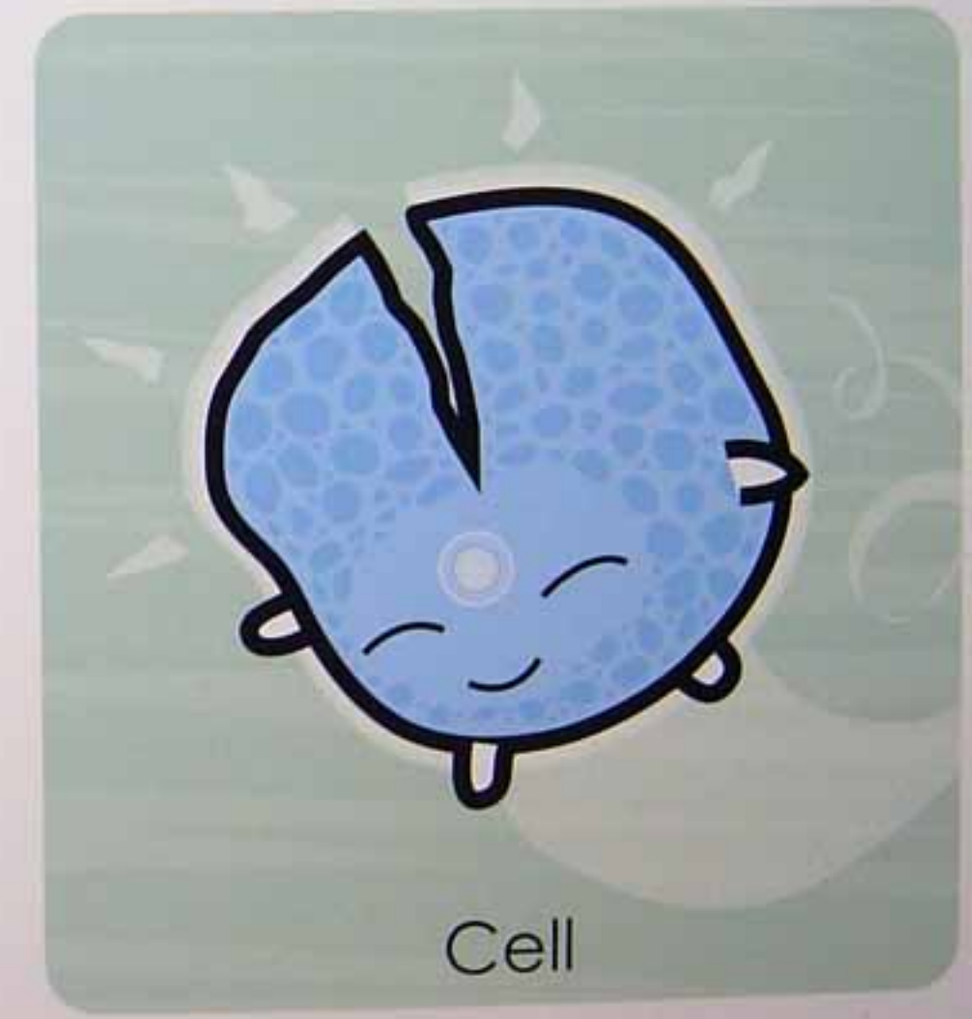
Building Blocks

- The smallest living part of a protist, fungus or animal
- Your body is made up entirely of these useful chaps
- Each cell is a specialist and has a particular job to do

You can't help but love me. Every bit of your body is made of me – and I'm all yours! I'm totally devoted to you because I couldn't survive on my own. You are a collection of many millions of me, and my friends and I do everything for you – move, eat, think and feel. If necessary I will even die for you.

There's nothing gloomy about life in this cell. I'm a slippery bag with a tiny factory inside. I buzz with activity as about 100 million molecules whizz around inside me. I have a team of chemical workers, who manufacture 20,000 different substances, all vital to life. My most amazing stunt is to split myself in two and make another fully working copy of myself. This is how I construct your body from only a few hundred different types of me.

- Discoverer: Robert Hooke (1665)
- Average size: 2×10^{-5} m
- No. of cells in human body: 10 trillion



DNA

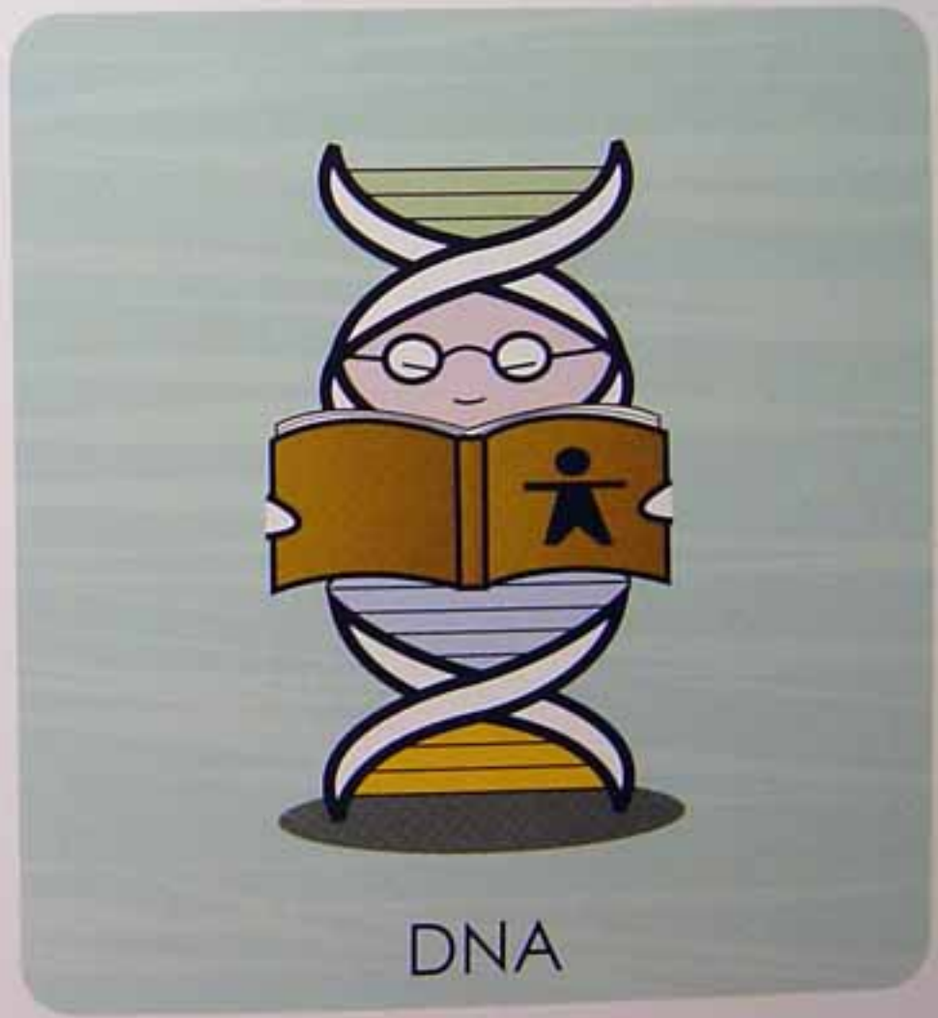
Building Blocks

- A library of info telling your body's cells how to build you
- Shaped as a "double helix", this chemical spiral codes for life
- This guy's full name is "Deoxyribonucleic Acid"

Some think that I'm a totally twisted individual, but while my slinky curves turn heads, I'm actually quite a bookish character. I'm so astounding that, within my graceful folds and sinuous switchbacks, lies the secret of life itself.

Each Cell in your body has a library of me, called its "genome", stored for safekeeping in the Nucleus. The library has 46 books in it, called chromosomes. Each page of each book is a gene that holds the code for one attribute – your hair colour or weakness to diseases, for example. The words in these "books of life" are molecules that link together to make my corkscrew chain. Strangely, most of your DNA is junk – it has no meaning. Although each person's DNA is unique, 98.1 per cent of it is identical to that of everyone else.

- Discoverer: Friedrich Miescher (1868)
- No. of human genes: 20,000-25,000
- No. of times DNA is damaged per day: 10,000



Leaf

Green Shoots

- A Sun-loving lounger that collects the energy used by a plant
- Has been growing on plants for at least 400 million years
- Usually flat and wide to help catch the Sun's rays

It's a tough life being a Leaf. My job is to bask in the Sun all day, soaking up as much light as I can. Ah! Sounds like bliss, but I'm no slouch. I make all the food for a plant.

I'm more organized than you might think. I'm positioned so I don't block out the light for other leaves and I can't be too heavy, so I have a super-light internal skeleton.

I also do the "breathing" for a plant, absorbing carbon dioxide through tiny pores on my surface. I often have a wax coat to stop water loss. Because I'm full of sugar, I make a tasty treat for caterpillars, insects and humans, so I sometimes defend myself with poisons and stinging spines. You're not the only one who hates hearing the words "Eat your greens!"

- Largest leaves: Type of raffia palm (24 m long)
- Leaves per tree (oak): 200,000
- Leaf weight (oak): 1.6 tonnes over 60 years