



THIS IS

Eddie

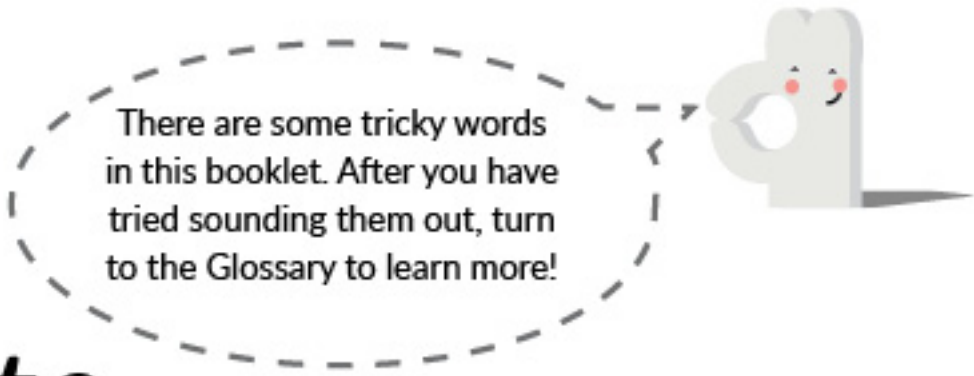
the

EPFRR



Molly Lattin





There are some tricky words in this booklet. After you have tried sounding them out, turn to the Glossary to learn more!

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Written, designed, and illustrated by Molly Lattin

Consultant academics and researchers: Professor Peter Sly, Dr. Stephania Cormier, Dr. Dwan Vilcins, Dr. Ayaho Yamamoto, Wen Ray Lee



This is a story about the tiny biological processes that happen inside our body when we breathe polluted air.



I'm Willy! I get wheezy when things from the environment make me sick.

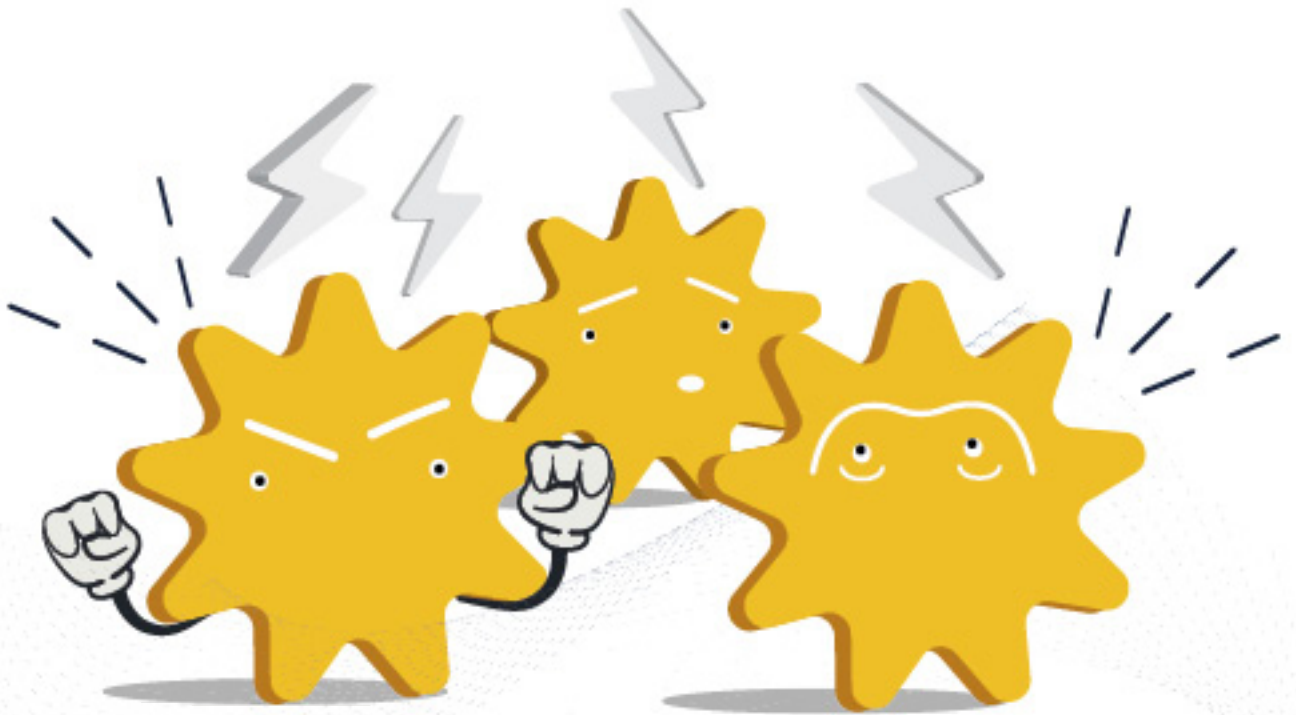
One winter evening a big gust of wind blew across the street...



Willy looked out the window...



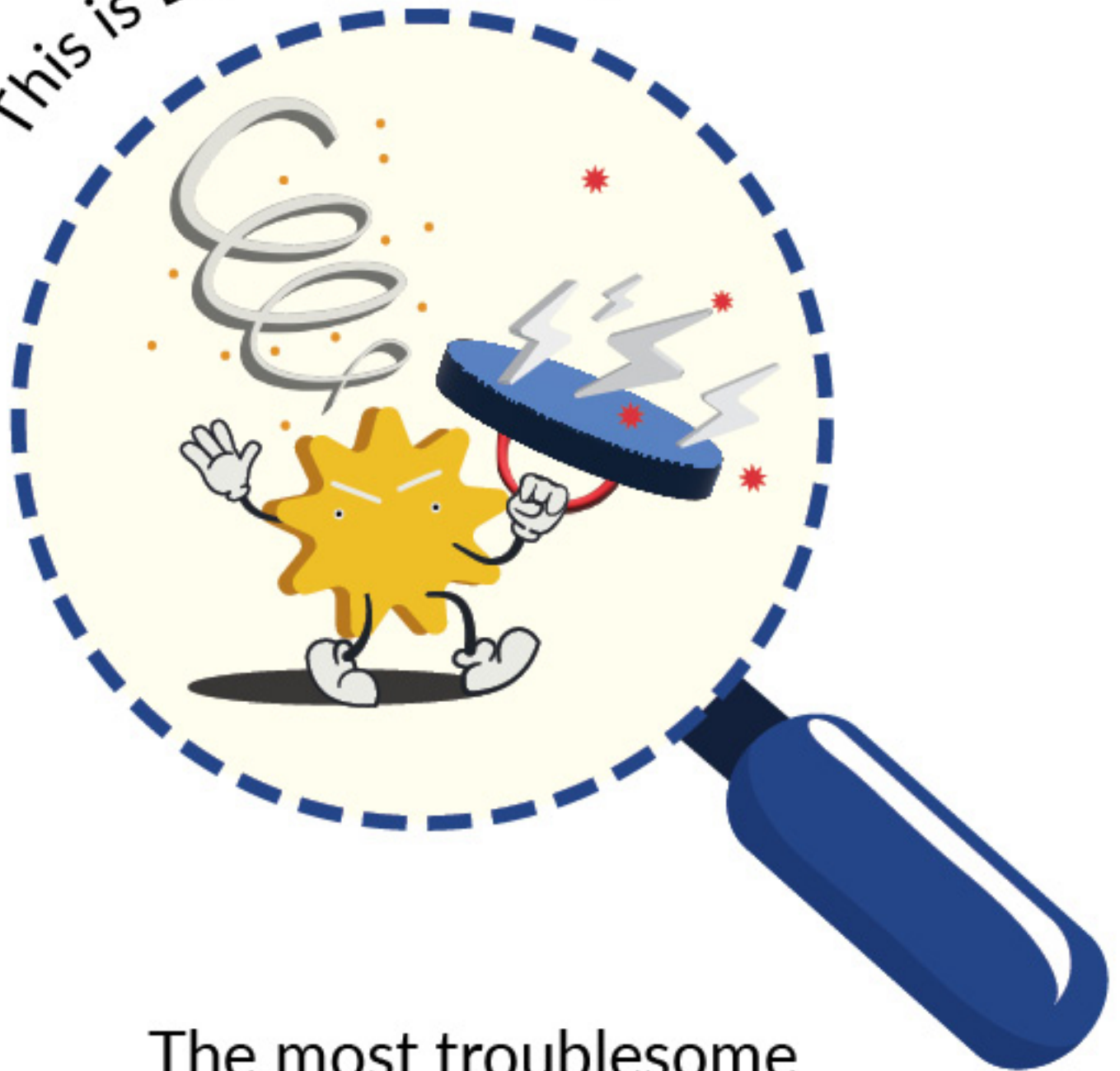
He noticed the gust of wind was filled with tiny specks of dust.



It was Eddie and his EPFR gang!

When Willy looked closer he saw something strange. The specks were looking back at him.

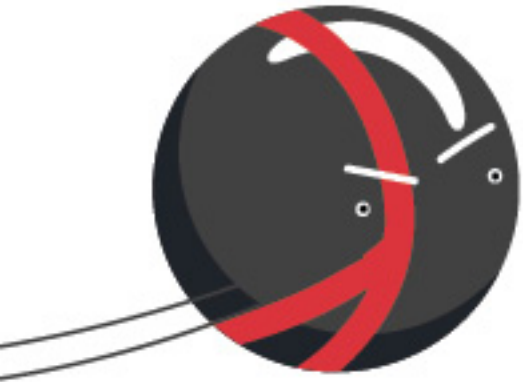
This is Eddie the EPFR!



The most troublesome
speck there is.

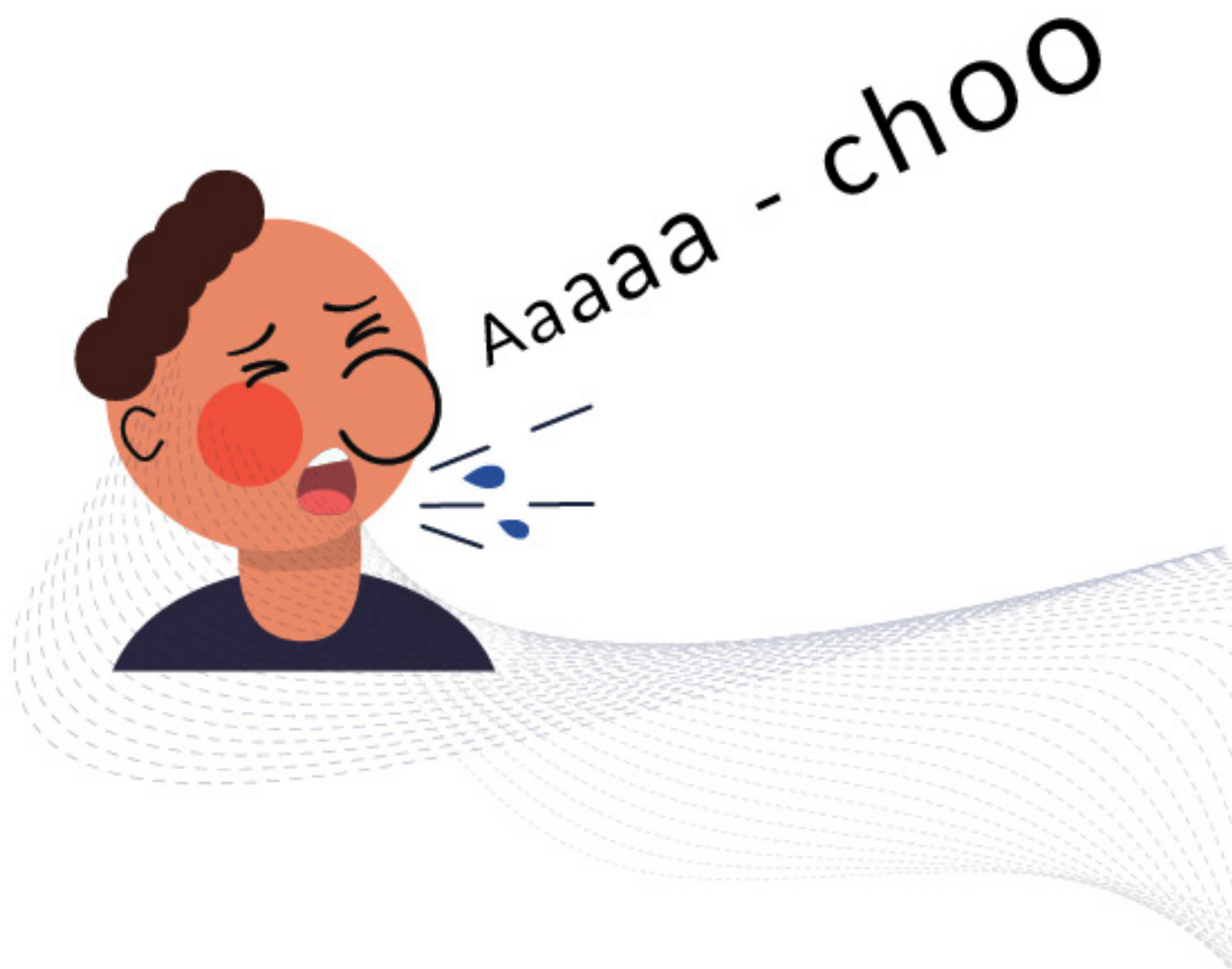


Eddie and his EPFR gang ride
through the air on carbon chariots...



... and hide in house dust
ready to attack and cause
mayhem.





Uh-oh. Eddie and his EPFR
gang got in!

Inside Willy's body, Eddie shoots electrons as lightning bolts. He has a metal shield so he never runs out of electrons to shoot.



Eddie's shield is very powerful. It can shoot lots of lightning bolts at once!

Facts about Eddie the EPFR



What does EPFR stand for?

EPFR stands for environmentally persistent free radical.



Where does Eddie the EPFR come from?

Eddie is created when we burn things. For example, he appears in the exhaust pipe of a car burning fuel.

Eddie finds Radical Ron and ROS the Boss. They also like to steal electrons and throw them as lightning bolts.



Ron does not have a metal shield like Eddie so he can only throw one lightning bolt at a time.



He makes Willy very sick.

Facts about Radical Ron



Radical Ron is a typical free radical. What is that?

A free radical is an atom that is missing an electron. Because of this, they like to steal electrons from other nearby molecules.



Where does a typical free radical come from?

They are created in chemical reactions happening everywhere all the time.

Sometimes free radicals keep us healthy, but sometimes they are like Radical Ron and make us sick.

Facts about ROS the Boss



What does ROS stand for?

ROS stands for reactive oxygen species.

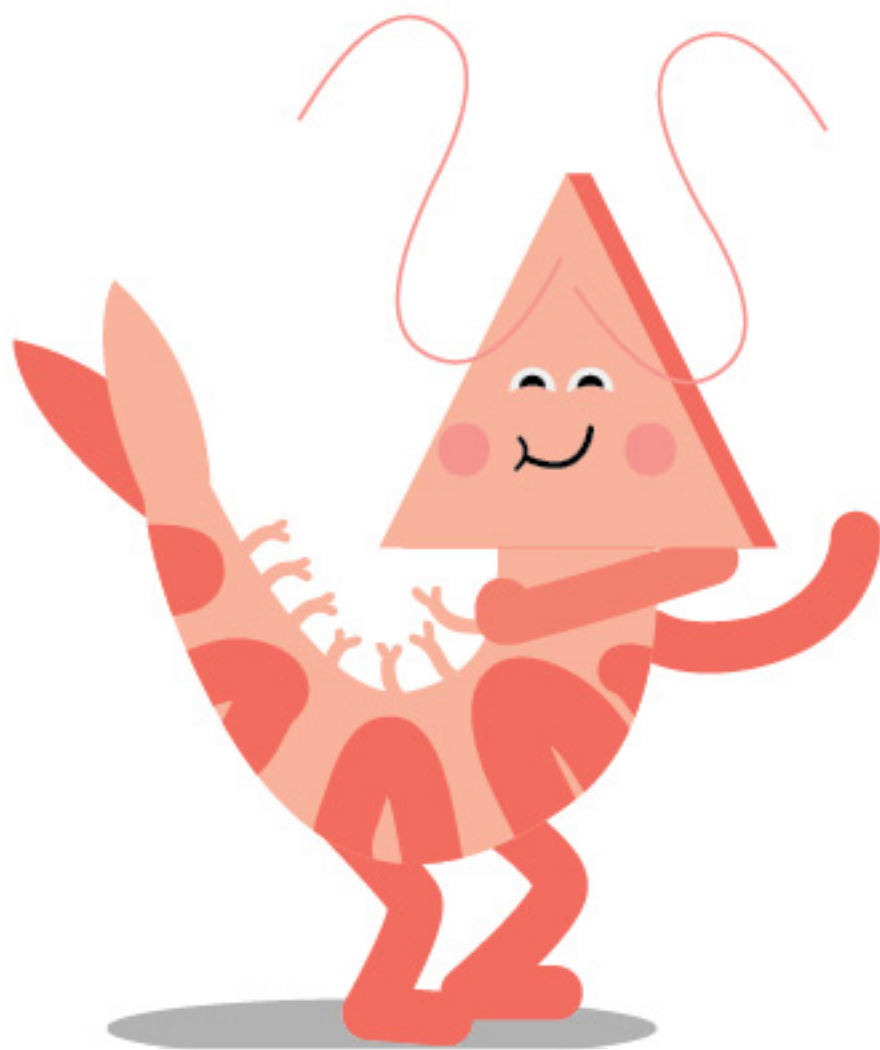


What does ROS do inside our body?

A lot of ROS will create oxidative stress. This damages our cells and makes us sick.

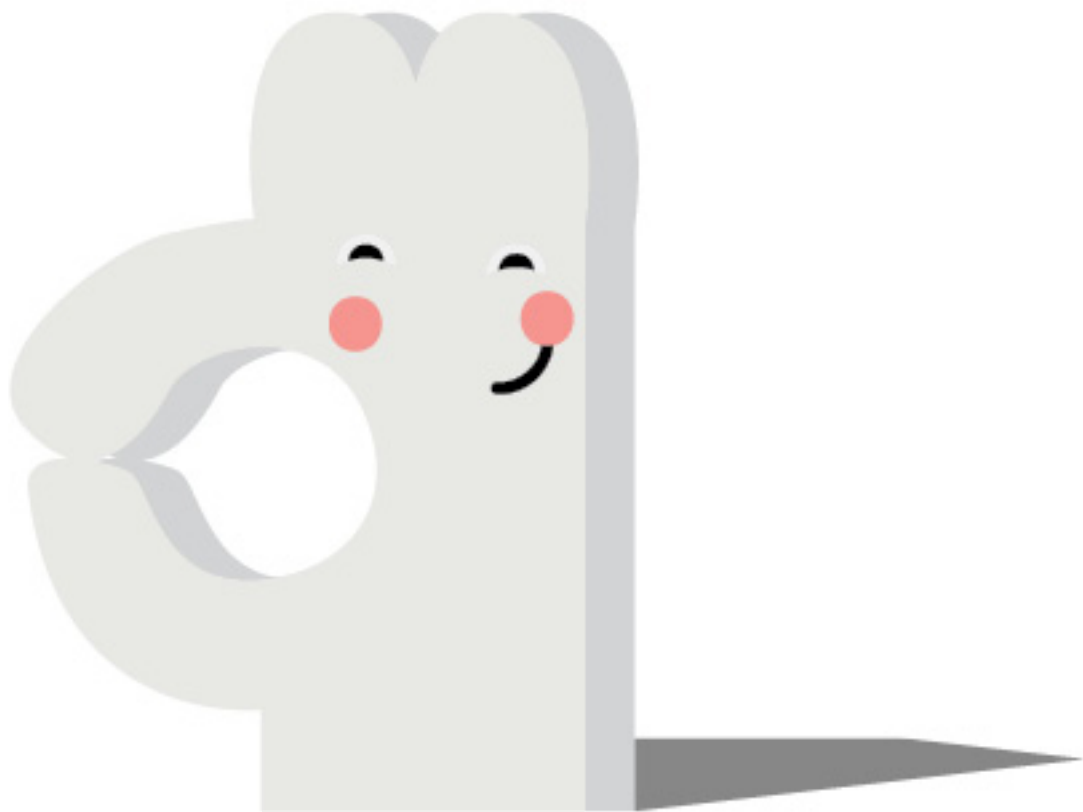
Eddie the EPFR encourages our body to make lots of ROS.

Who can protect Willy from these troublesome specks?

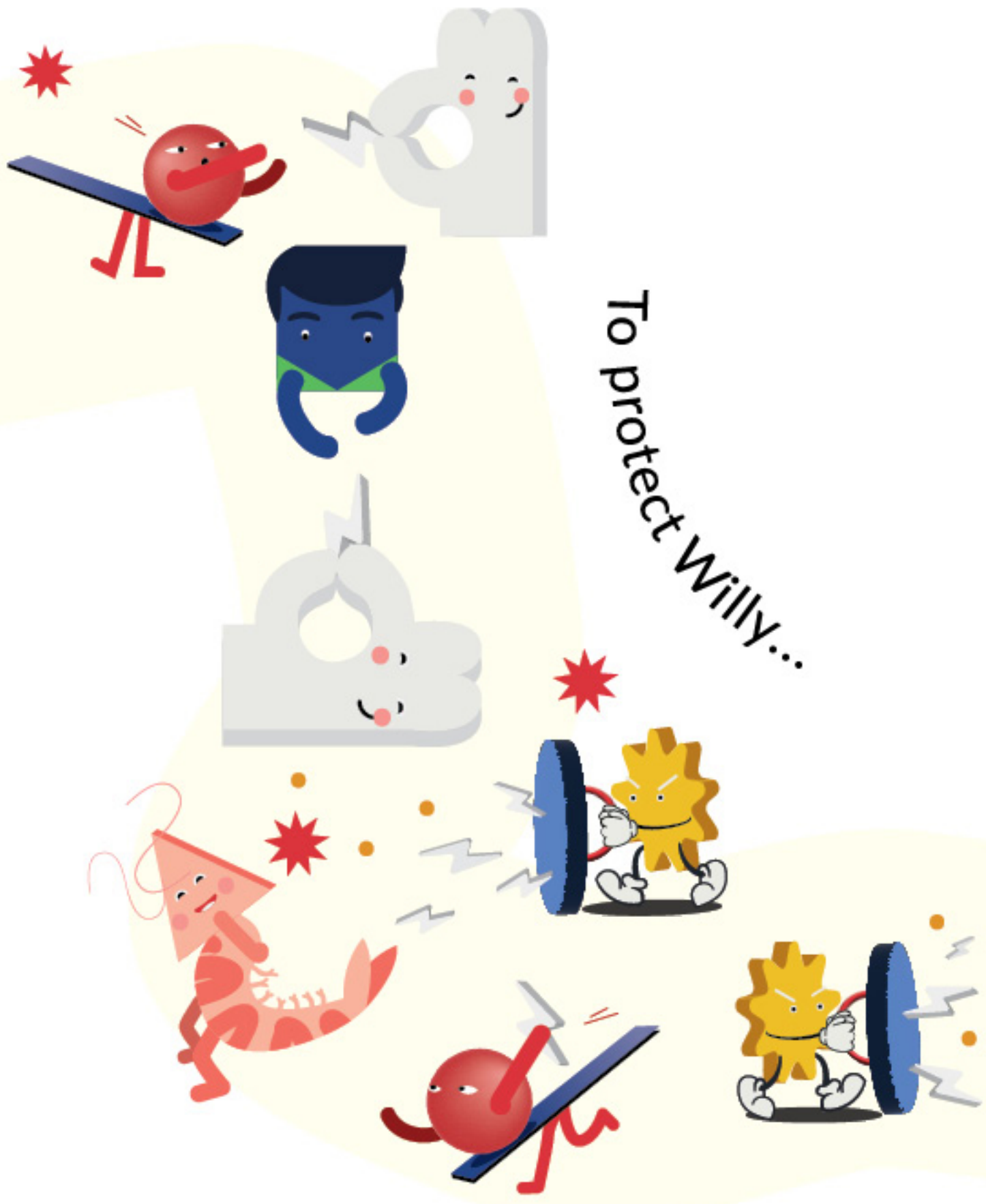


Xanda the antioxidant! She is built from prawn shells.

And Glutathione George!
He has a name that is hard to say
(Glu - ta - thigh - on)
can you say his name?



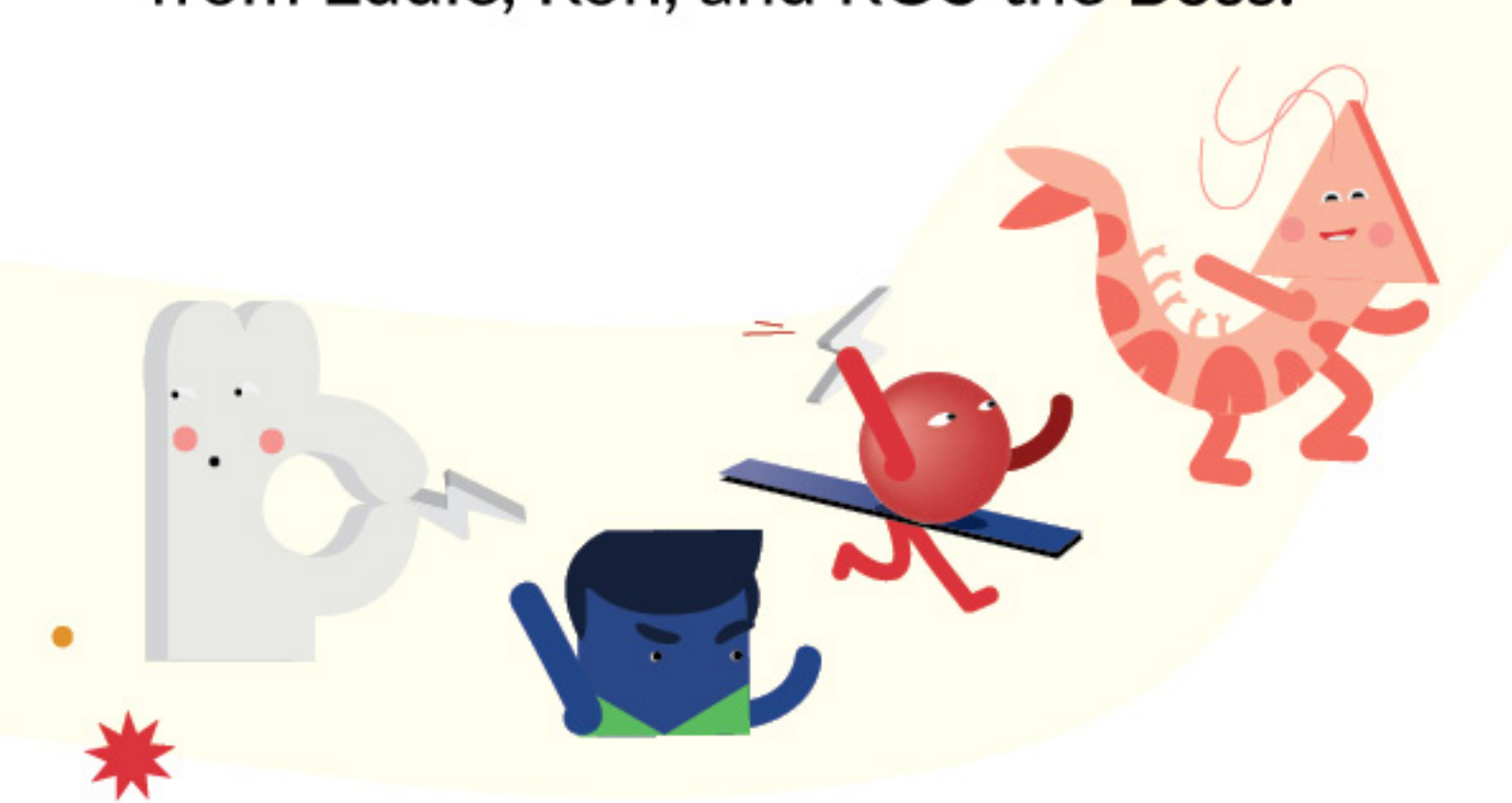
He pinches electrons from
Eddie, Ron, and ROS the Boss.
That way, the electrons can't be
thrown as lightning bolts.



To protect Willy...



Xanda neutralises electrons with her tail while George steals electrons from Eddie, Ron, and ROS the Boss.



Facts about Xanda the antioxidant



**Where do
antioxidants
come from?**

There are many different types of antioxidant molecules.

They are commonly found in fruit and vegetables. A very powerful antioxidant can be found in prawn shells.



**What do
antioxidants do?**

Antioxidants are like bodyguards for our cells. They fight against harmful free radicals and keep us healthy.

Facts about Glutathione George



What is glutathione?

Glutathione is an important molecule found in our lungs.



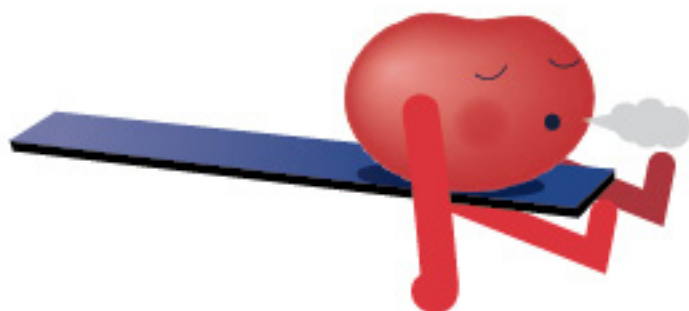
What do scientists know about glutathione?

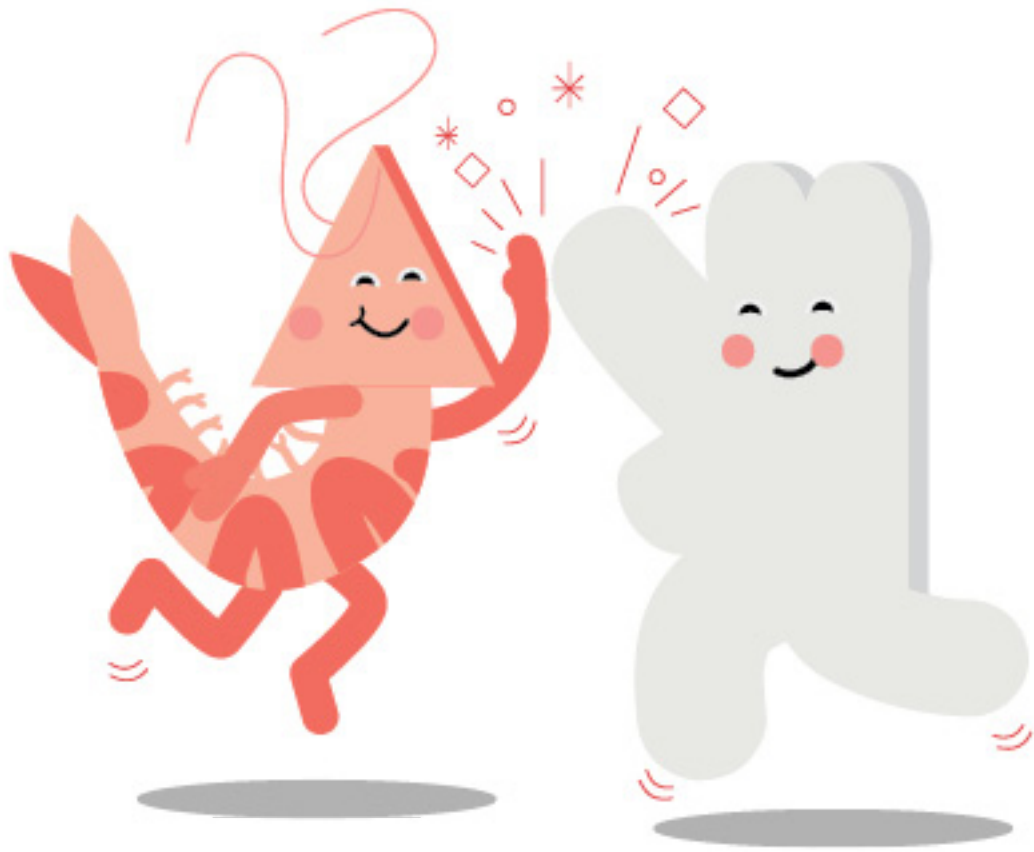
Glutathione scavenges for ROS inside our body. Glutathione works like a cleaner and removes harmful ROS. This helps to keep our lungs working properly.

Eddie, Ron, and ROS the



Boss become weak. They can't shoot anymore lightning bolts.





Xanda the antioxidant and
Glutathione George have won!

Summary



What now?



Xanda and Glutathione George have overwhelmed Eddie, Ron, and ROS the Boss.

They have helped prevent oxidative stress. Now Willy can breathe easy!

Glossary

-  **Biological processes**
Activities that happen inside living things, such as breathing, digesting food, or healing. They help keep our bodies working properly.
-  **Wheeze**
Wheeze is a sound you can hear coming from someone's chest. Sometimes people wheeze when they have asthma.
-  **Atom**
Think of atoms as tiny building blocks that make up everything in the universe. Atoms are made up of electrons, protons, and neutrons.
-  **Electron**
A tiny particle that is part of every atom. Electrons help atoms stick together to form different kinds of substances.
-  **Oxidative stress**
In our bodies, oxidative stress is a harmful chemical reaction that happens when there are more ROS than antioxidants.
-  **Cell**
Cells make up all living things, including animals and plants. They come in many different shapes and sizes and perform a variety of tasks inside our body.
-  **Molecule**
A molecule is two or more atoms joined together to make a substance.
-  **Antioxidant**
A molecule that prevents or slows down the damage done by free radicals.



Eddie the EPFR