

# INÉS and the bacteria



WANNA  
HELP US  
STOP  
ANTIBIOTIC  
RESISTANCE?



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Hi, guys!

My name is **INÉS**. I'm **10 years old**, and I'm in Year 6. I live in a lovely neighbourhood in a middle-sized town with my parents, my big brother and sister, and our pet: a **blue** fish named **MARINO**.

I love watching superhero movies, reading, collecting cards, and mostly playing basketball. I play in the school team, and we have lots of fun.



Those who know me say I'm a pretty restless, curious and good girl. I ask questions all the time. But, when you don't understand something, that's the best thing to do, **isn't it?**





I wanna tell you something I went through some months ago: **I GOT ILL**. I lost my appetite was exhausted, I had a terrible cough and a temperature...

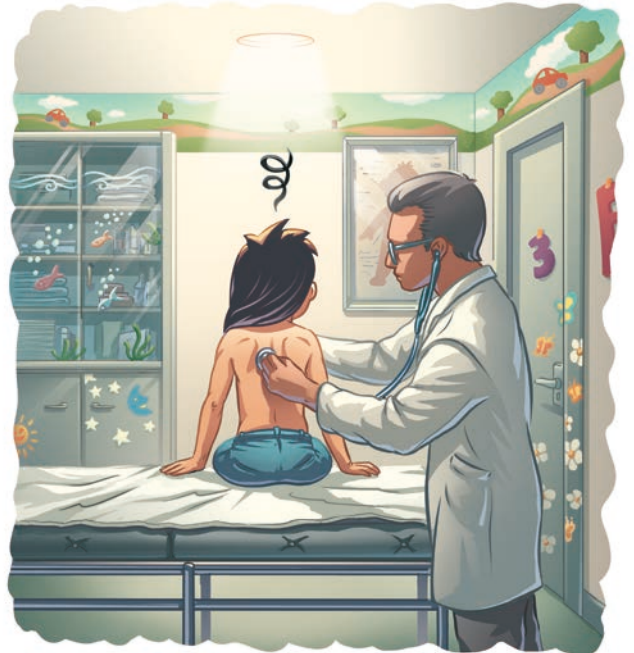
**[ I FELT TERRIBLE. ]**

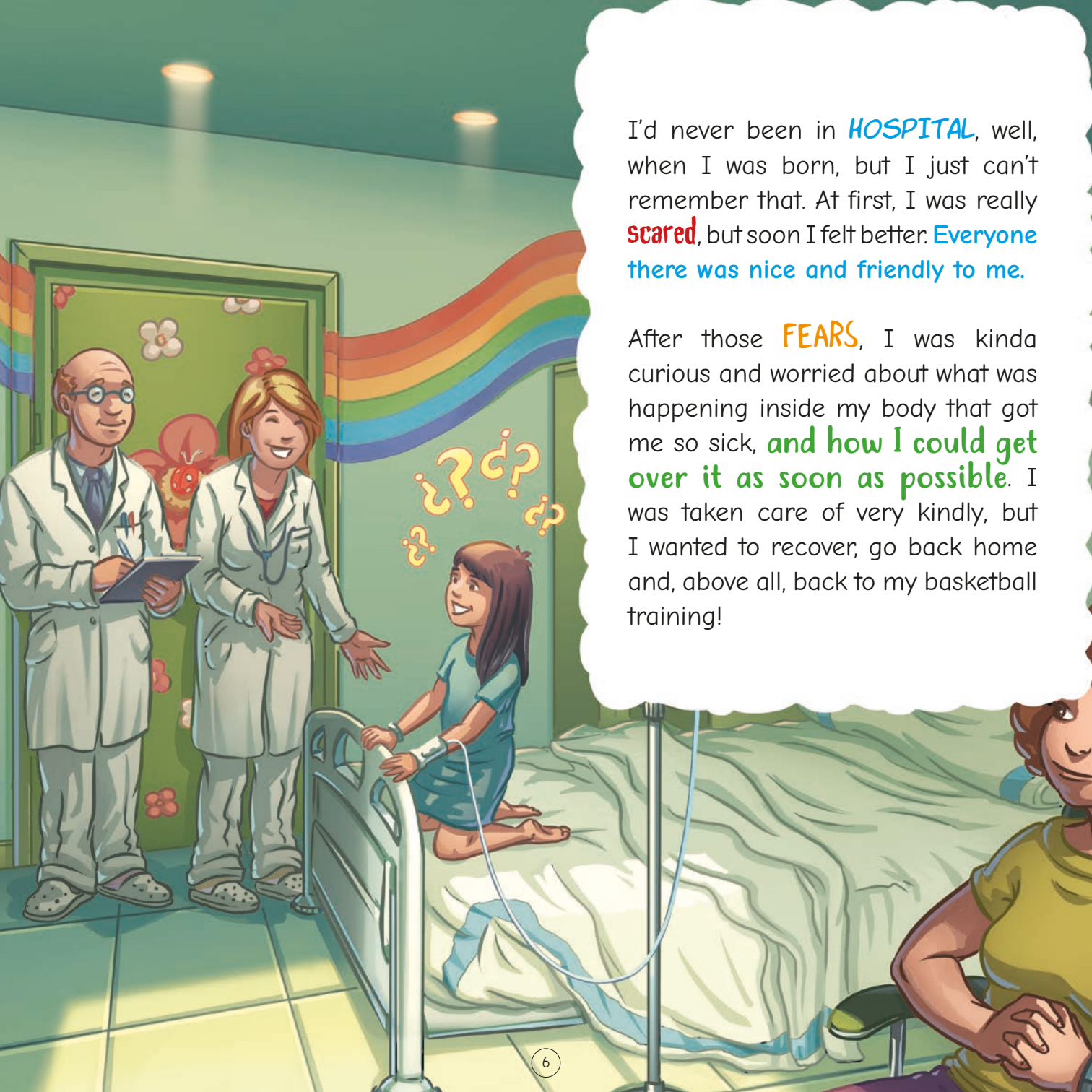


My **PEDIATRICIAN** ran some tests and, when the results came back, he told me I should get admitted to **HOSPITAL** to get better treatment.

But what was wrong with me? I got an **infection**, a **bacterial infection**. More precisely,

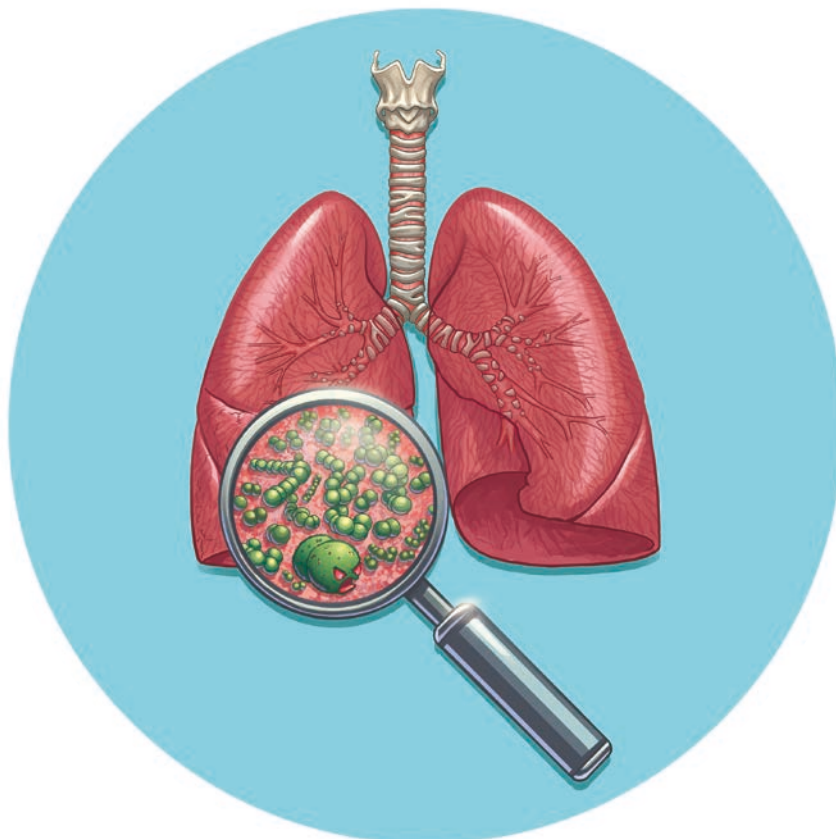
**BACTERIAL PNEUMONIA.**





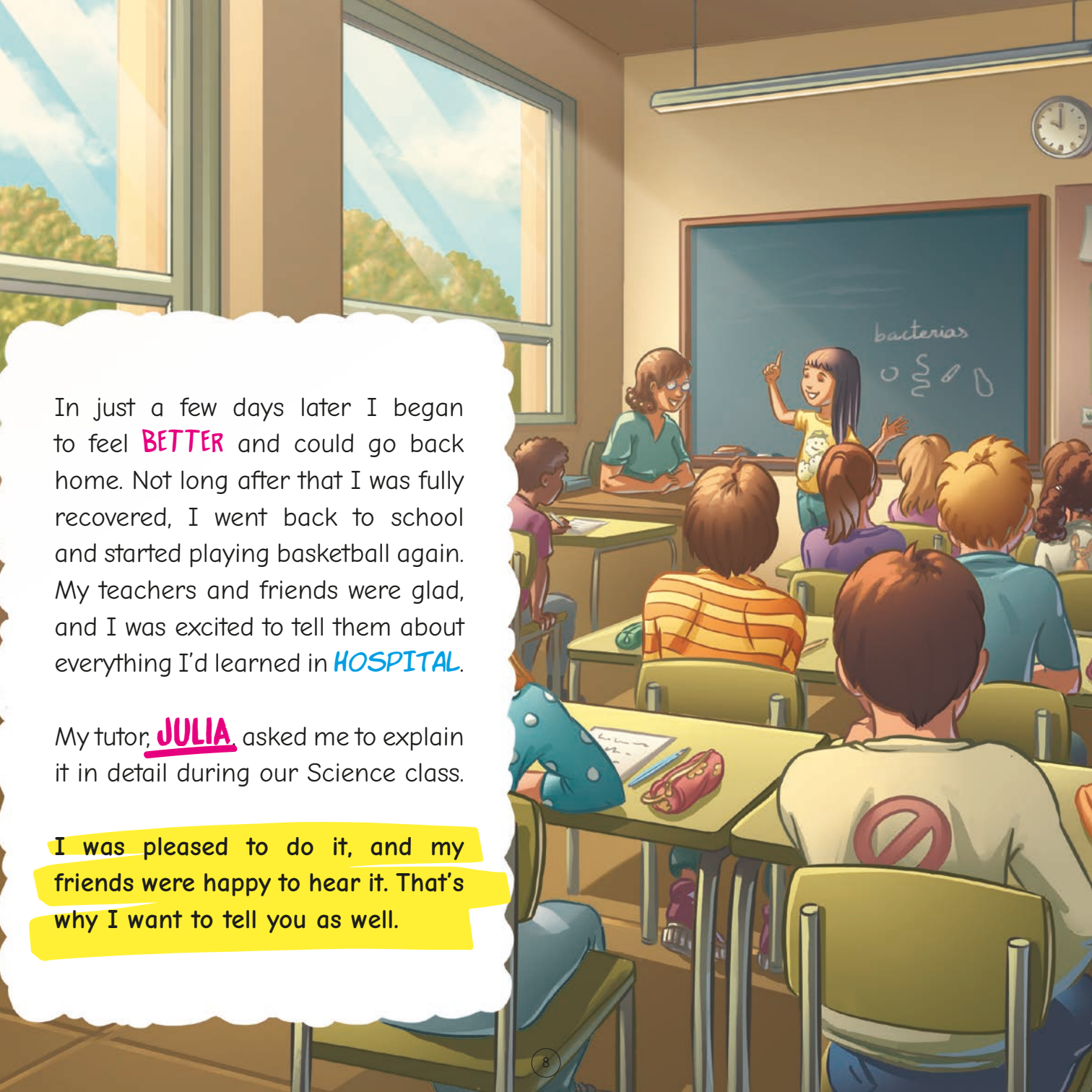
I'd never been in **HOSPITAL**, well, when I was born, but I just can't remember that. At first, I was really **scared**, but soon I felt better. **Everyone there was nice and friendly to me.**

After those **FEARS**, I was kinda curious and worried about what was happening inside my body that got me so sick, **and how I could get over it as soon as possible.** I was taken care of very kindly, but I wanted to recover, go back home and, above all, back to my basketball training!



As I told you before, I'm quite **CURIOUS**, so I started to **ASK** all those people looking after me a million questions about my **BACTERIAL PNEUMONIA**. They were very patient, and I was really grateful, not only because I could understand exactly what was wrong with me, and how things would turn out, but also, cos I learned a lot about **bacteria**, **ANTIBIOTIC DRUGS** and **ANTIMICROBIAL RESISTANCE** (something they all told me they were very worried about).





In just a few days later I began to feel **BETTER** and could go back home. Not long after that I was fully recovered, I went back to school and started playing basketball again. My teachers and friends were glad, and I was excited to tell them about everything I'd learned in **HOSPITAL**.

My tutor, **JULIA**, asked me to explain it in detail during our Science class.

**I was pleased to do it, and my friends were happy to hear it. That's why I want to tell you as well.**



So, I'm going to introduce you to the main characters in this story, although you already know me. First, there are the **bacteria**. Some time ago, we didn't know very much about **bacteria**, just that they were some tiny **MICROBES**. But in **HOSPITAL** I was told a lot of amazing facts about these **MICROSCOPIC GERMS**.

To begin with, I learned that **bacteria** are little germs made up of a single **CELL**: they are just like a thousandth of a millimetre in size and get their food from their environment to survive.

They are the oldest living organisms on the planet, much older than dinosaurs! In fact, human beings evolved from them.



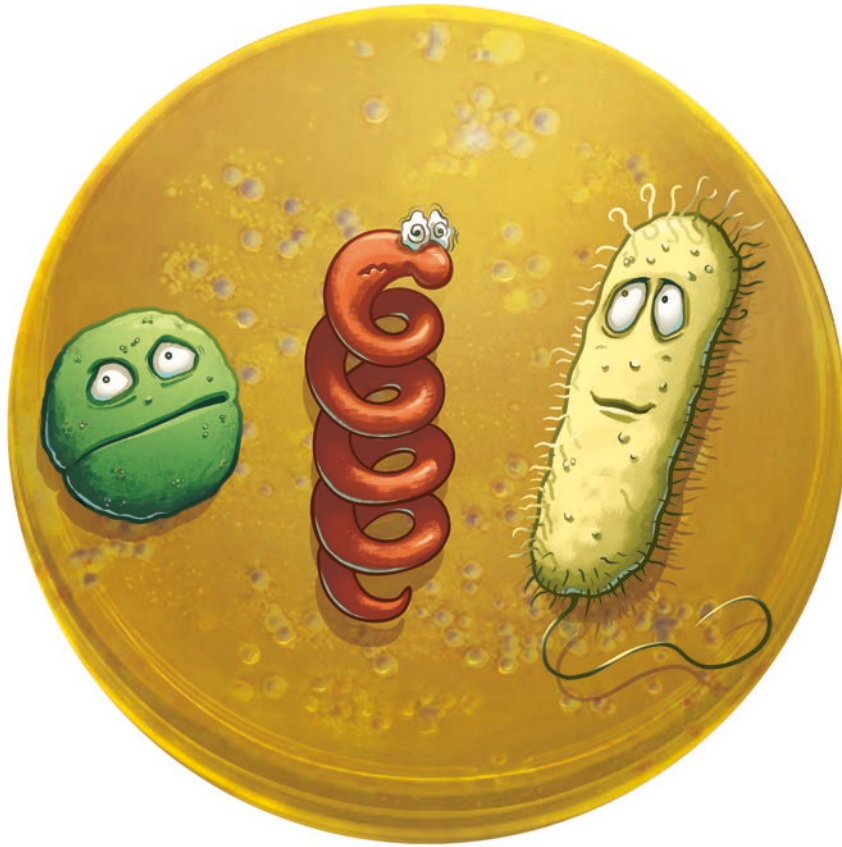
What's more, they are the most common beings, and they literally live everywhere: air, water, soil, animals, plants... **Some of them can even survive in outer space,**

**AMAZING!**

**I HAD NEVER  
IMAGINED THEY WERE  
RESPONSIBLE FOR SO  
MANY THINGS!**

They are in charge of many important processes, both in our body and in nature. In fact, life on our planet would not exist without them.





I was shown a book –from the **HOSPITAL** library– that fascinated me cos it had plenty of pictures to explain the types of **bacteria** and their classification: **BACILLI**, which are rod-shaped bacteria; **COCCI**, which are round like a ball, and **SPIRALS**, which look like a spring.



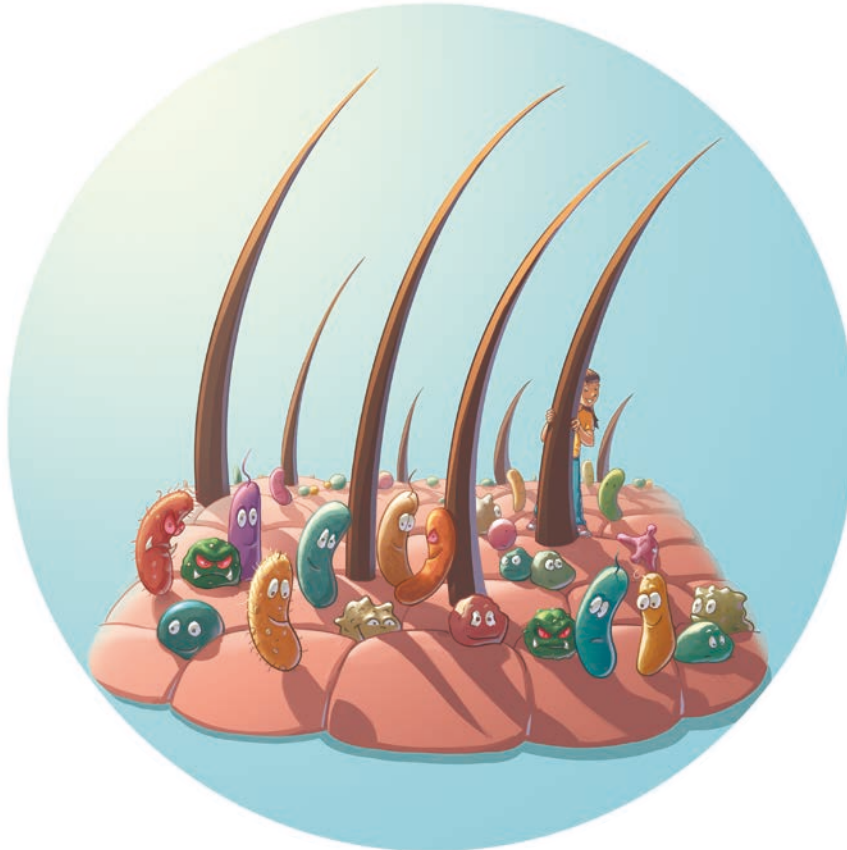
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The point here is that I was curious to know what had happened with the **bacteria** inside me to make me so ill. They explained to me that **bacteria** are everywhere in the human body.

**Just in every square centimetre of skin there are... 10.000 bacteria!**

Many of those **bacteria** help us keep **HEALTHY** and are essential; however, there are other bacteria, known as **PATHOGENIC** bacteria, which are dangerous. Luckily, there are very few like that.

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When dangerous **bacteria** multiply in our bodies, they can release **HARMFUL SUBSTANCES** called **TOXINS**, which make us feel sick by damaging tissues and organs and provoking infectious diseases. Our **IMMUNE SYSTEM** or other **bacteria** try to protect us from **PATHOGENIC BACTERIA**, and most of the times they defeat any dangerous microbe. But sometimes, things may get more complicated.

For example, in my case, those **harmful bacteria** got into my lungs and started to multiply so fast that they managed to overtake my **DEFENCES**. They damaged my body and then I got symptoms of **BACTERIAL PNEUMONIA**, like **fever**, cos my immune system was trying to protect me against the **INTRUDERS**.



On some occasions, as happened to me, our body has **DIFFICULTIES** in clearing the **infection** on its own and needs some help from the outside.

This is when the following character in my story comes on the scene.

Here it is: the **ANTIBIOTIC**. **Does it ring a bell?** Yeah, for me too. To be honest, I just knew it was a **DRUG** and I hadn't asked my parents much more. But now that I knew what was happening with the **bacteria** and my infection, when the **DOCTORS** told me I had to be treated with an **ANTIBIOTIC** to get well, I was eager to know how the **ANTIBIOTIC** worked in this situation. As always, **I asked a lot of questions:**





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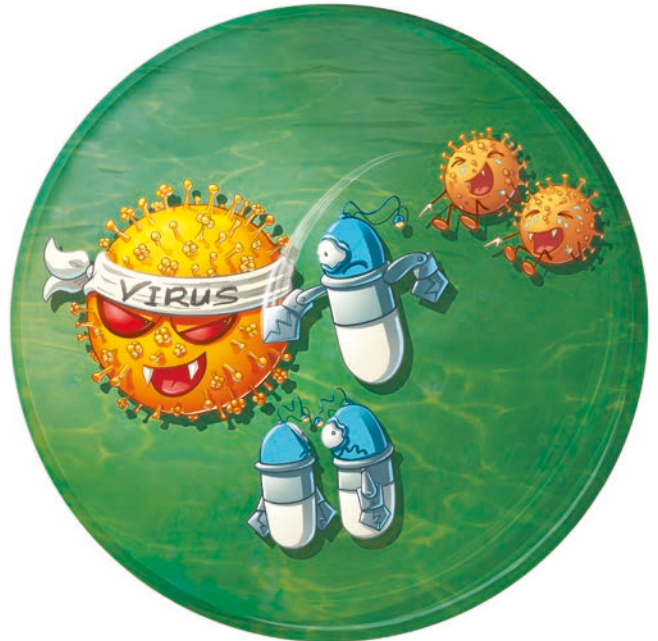
They taught me that **ANTIBIOTICS** are **DRUGS** to treat **infections** caused by **PATHOGENIC BACTERIA**. Remember: the **dangerous** ones for people, animals, and sometimes plants. They insisted on this: **INFECTIONS CAUSED BY BACTERIA**.

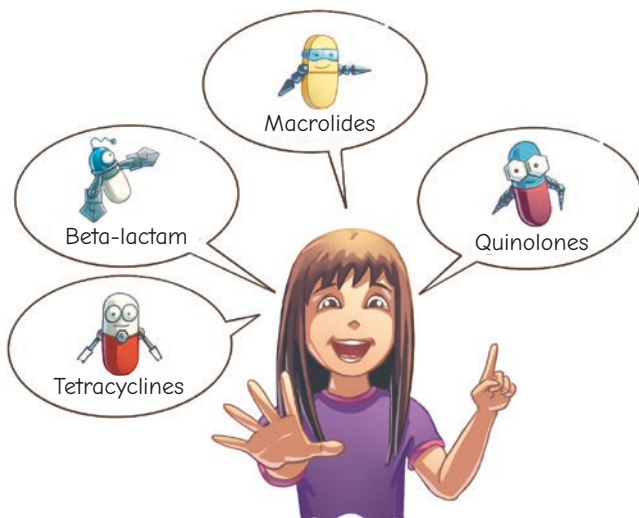
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In other words, they do not attack **VIRUSES**; that is why **ANTIBIOTICS** are not useful to treat either a cold or a flu, which are caused by **VIRUSES**.

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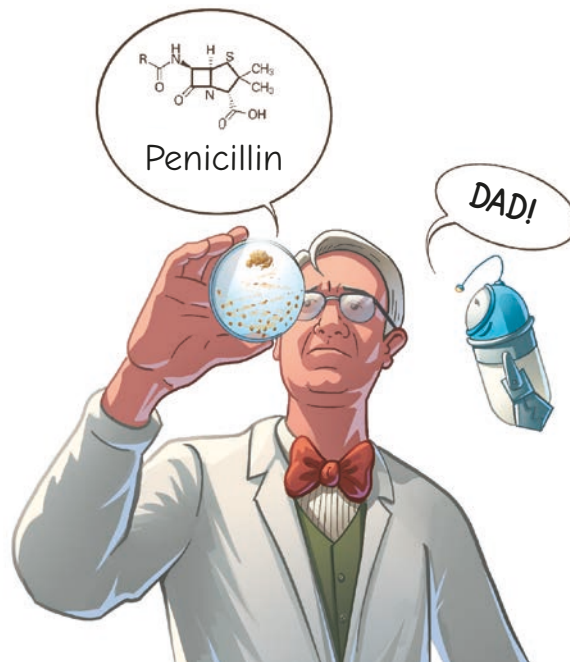





I learned there are many types of **ANTIBIOTICS**. Their names were all gibberish to me and very difficult to say. Depending on the type they belong to, they may be **EFFECTIVE** against different types of **bacteria** and act differently: for example, some **ANTIBIOTICS** may prevent **bacteria** from reproducing, whereas others just kill them.

The doctors told me it was British scientist **ALEXANDER FLEMING** who first discovered an antibiotic drug. It was in 1928 and he named it "**PENICILIN**". This name is not that difficult, though.

This was an outstanding discovery and has changed **MEDICINE** ever since. Thanks to research, new **ANTIBIOTICS** were developed, and a lot of incurable **infections** could then be cured. In fact, many years later, **DR. FLEMING** was granted the Nobel Prize in Medicine!





I was truly amazed to find out how important science was to improve our lives!

At that moment, I decided I wanted to be a scientist when I grow older. Adults would ask me this question over and over: what do you want to be when you grow up? I never knew what to answer and got angry. Great! Now I had an answer, and I was beyond excited.

Well, the thing is that the faces of my “hospital teachers” got me really nervous. Then they told me about **ANTIBIOTIC** resistance again. I warned you they were deeply concerned.





# WHAT WAS IT ABOUT? **BACTERIA** TRYING TO DEFEND THEMSELVES

Along time bacteria have learned several ways to protect themselves from **ANTIBIOTICS**. For example, they can produce **PROTEINS** to destroy the **ANTIBIOTIC** structure, they can prevent the **DRUG** from coming into the bacteria, they can change the shape of the place where the **ANTIBIOTIC** works or even get the **ANTIBIOTIC** out once inside the **bacteria**. Worse than that, **bacteria** can pass these **RESISTANCE MECHANISMS** on to their descendants and to other **bacteria**.



And these resistant **bacteria** can even propagate to other people causing a new **infection**.

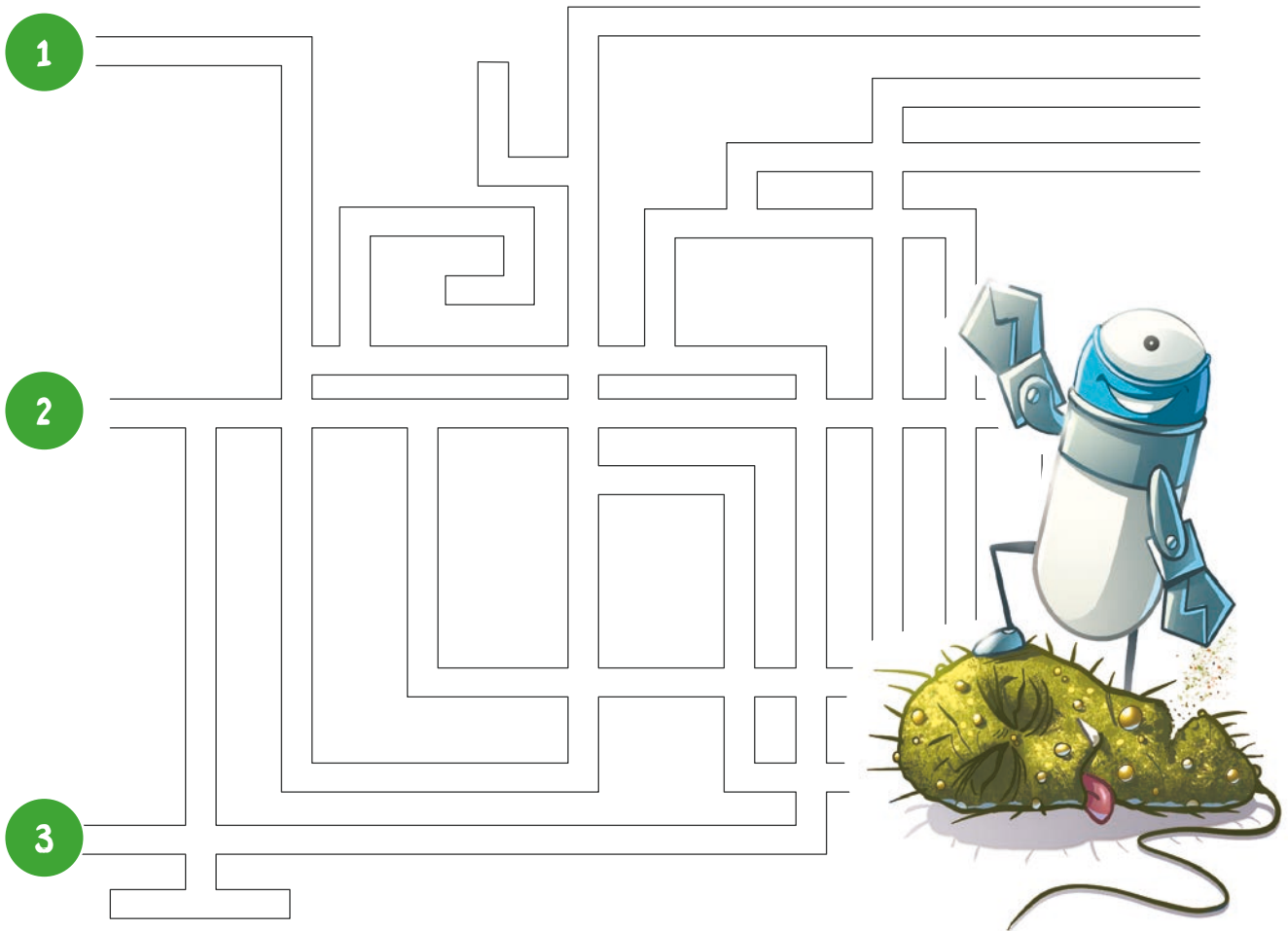
As a result, if we use **ANTIBIOTICS** in the wrong way or in excess, **DANGEROUS bacteria** become more resistant to them, making **BACTERIAL INFECTIONS** more difficult to treat and cure. Moreover, they explained to me that a lot of medical procedures, such as organ transplants or cancer therapies, carry an increased risk of **infection** and patients need to get effective **ANTIBIOTICS**.

Infections caused by resistant bacteria are a major health issue! Not a surprise, then, that they were all worried about **BACTERIAL RESISTANCE** at the hospital.

Wow! It's a serious risk for everyone!



Right away, I asked how we could help prevent this problem and improve the situation. They taught me what was the correct way to avoid **ANTIBIOTIC RESISTANCE**. As I listened to them, it reminded me of the maze game on some puzzle magazines my parents used to buy me while on holiday. You surely know what I'm referring to, those with different possibilities but just one right way to find the exit:





**FIRST WRONG WAY:** Taking **ANTIBIOTIC DRUGS** without a **medical prescription**. Our **doctor** is the only one who can tell us to use **ANTIBIOTICS**, and which one to take, if needed. **We shouldn't take antibiotics either prescribed to other people or for a previous infection.** As we said, there are plenty of **ANTIBIOTICS** to treat **BACTERIAL INFECTIONS** and each one is effective for a certain type of **PATHOGENIC BACTERIA**.



**Do you remember the types of bacteria?** Just imagine we used an **ANTIBIOTIC** which only attacks **COCCI** (the ball-shaped bacteria) to treat an infection caused by **BACILLI** (the rod-shaped bacteria). We would be using an inadequate tool to solve our problem. **The infection won't be cured, we will still be sick, bacteria will keep on attacking and may become more resistant to ANTIBIOTICS.** Moreover, the **ANTIBIOTIC DRUG** would also harm a lot of our **beneficial bacteria**, poor them.

**SECOND WRONG WAY:** not following our doctor's recommendations about dosage and duration of the treatment. Despite feeling better, even if we feel totally recovered, we must always take the recommended amount of **ANTIBIOTIC** during the whole period advised by our **doctor**. Otherwise, **bacteria** won't be fully eliminated, and the **infection** might come back. If we don't complete the treatment, **bacteria** cannot be cleared off, they might become stronger and resist that **ANTIBIOTIC** in the future.



### THIRD WAY: THE RIGHT ONE!

For sure you already know what the right way to help stop **ANTIBIOTIC** resistance is. **Good job! Just take antibiotics only when they have been prescribed by your doctor and follow their indications to know how much and how long you must take them.** Besides, some other suggestions can be considered to help stop the spread of **infections**: wash your hands often and follow the advice of doctors about vaccines. This way we'll need **ANTIBIOTIC** treatment less often and will decrease the chances of **ANTIMICROBIAL RESISTANCE**.





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Following the right way, we will be protecting not only our and other people's health – my granny says: **IT'S THE MOST IMPORTANT THING** –, but also our planet's health, because if we manage to strike a balance between ourselves and everyone living on it, including **bacteria**, the world will be healthier and better.

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I hope you liked my story and hope it has helped understand better those beings we just can't see at first sight but are an essential part of our lives. **Anyway, I'm glad to tell you!**



I hope my story encourages you when deciding what you want to be when you grow up. Whatever you choose to be, you'll do great. Whenever you have any doubts, you know what to do: **ASK QUESTIONS!**



HI! IF YOU LIKED THIS STORY, YOU CAN SHARE  
IT BY SCANNING THIS QR CODE.  
REMEMBER: YOU CAN HELP US  
STOP ANTIBIOTIC RESISTANCE.



YOU MAY ALSO FIND SOME SURPRISES.  
TRY IT!

By scanning this QR code you help to cut down fewer trees  
and to keep a more sustainable and healthier planet.  
What is good for your health is good for the planet's health.

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