

# Vet Animals Need Vaccines, Too!

Written by  
Sandra San Miguel,  
D.V.M., Ph.D.

Harm HogenEsch,  
D.V.M., Ph.D.

Illustrated by  
CA Nobens





## VetaHumanz Need Vaccines, Too!

Written by: Sandra San Miguel, D.V.M., Ph.D. and Harm HogenEsch, D.V.M., Ph.D., D.A.C.V.P.

Illustrated by: CA Nobens

### Acknowledgments

Book design by Allison Carey, B.A. (Fine Arts).

Translation by Aida I. Vientós-Plotts D.V.M., D.A.C.V.I.M. (Small Animal Internal Medicine).

Photographs provided by Kevin Doerr and Kristie Mozzachio, D.V.M., D.A.C.V.P., C.V.A.

### Summary

Vaccines help people and their animals fight germs.

Supported by the Science Education Partnership Award (SEPA) program of the National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health (NIH). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

NIH . . . *Turning Discovery Into Health*

ISBN 978-0-578-92376-5

© 2021, Purdue University. All rights reserved.

A production of the Purdue University College of Veterinary Medicine

Learn more:  
[www.VetaHumanz.org](http://www.VetaHumanz.org)



College of Veterinary Medicine

# Table of Contents

What are germs? ..... 4

Germ fighting facts! ..... 6

Germ catchers! ..... 11

Why do we need vaccines? ..... 13

Where do vaccines come from? ..... 14

Who needs vaccines and when? ..... 16

How are vaccines given? ..... 18

Use your powers for good! ..... 20

Even superheroes need vaccines! ..... 21

Did you know . . . ? ..... 22

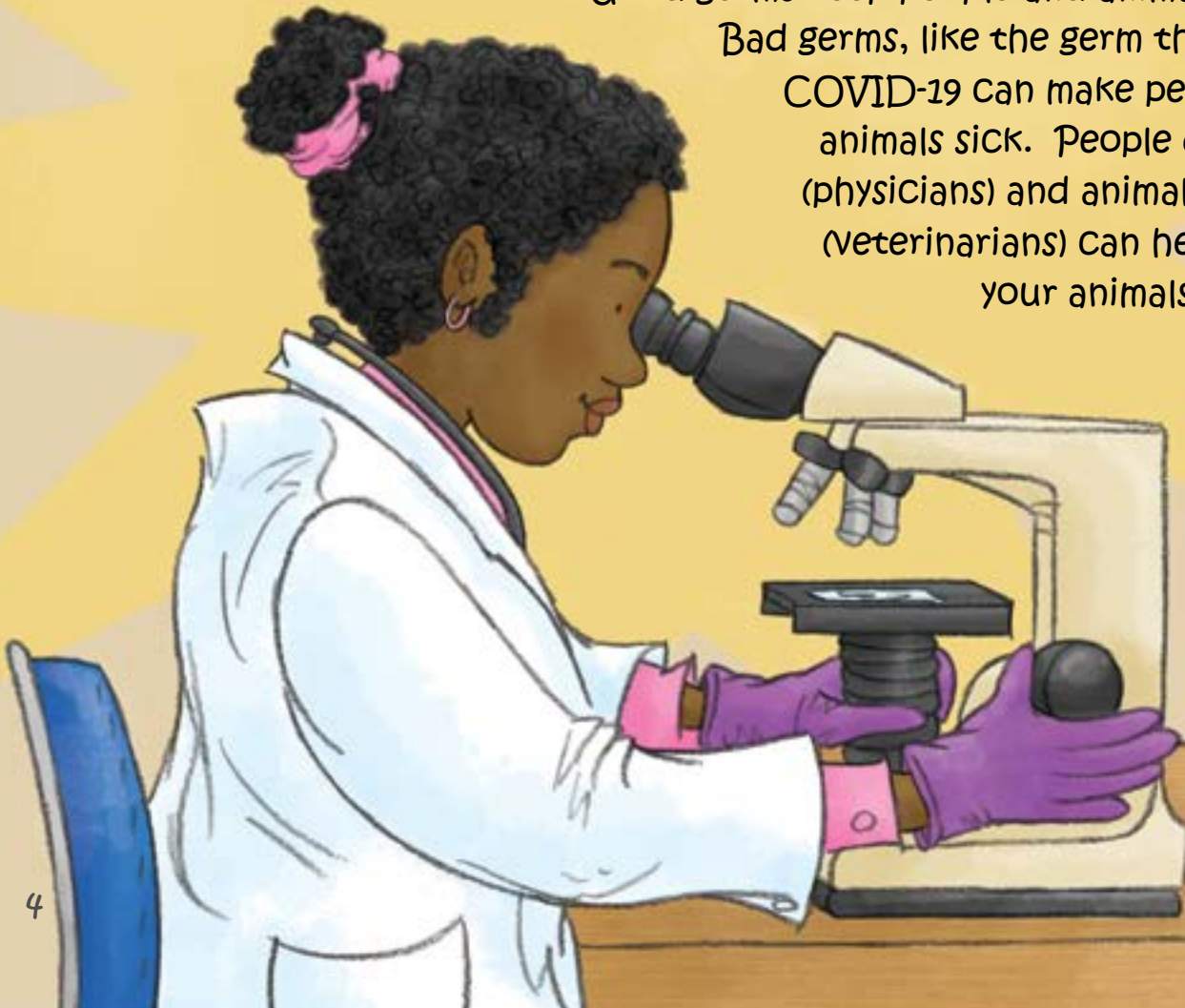
Word Bank ..... 24



# What are germs?

Germs are very tiny living things that we can't see with our eyes. The germ that causes COVID-19 is so small that if you lined them up it would take about 250,000 COVID-19 germs to make a line that is one inch long.

Good germs keep people and animals healthy.  
Bad germs, like the germ that causes COVID-19 can make people and animals sick. People doctors (physicians) and animal doctors (veterinarians) can help you and your animals if you get sick.





Germs are everywhere! Germs live inside and outside. Germs live in very hot and very cold places. Germs live in dry places like dust and wet places like water. Germs are in the air, in food, and even on door handles and toys.



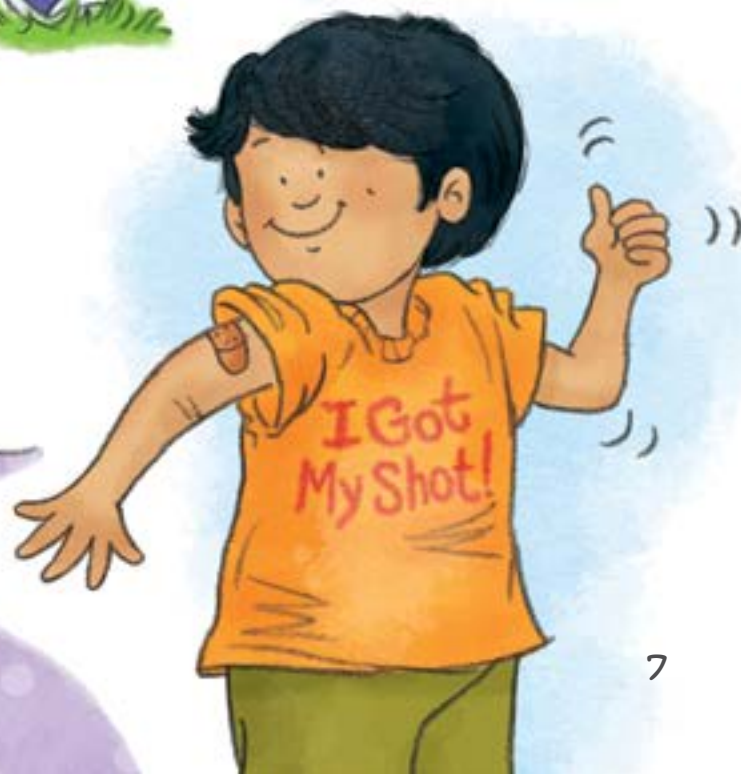
# Germ fighting facts!

We can fight bad germs by eating healthy, getting good sleep, and exercising.

We can wash our hands and brush our teeth. We can stop our germs from making others sick by wearing a mask, keeping a safe distance, cleaning things we touch, getting vaccinated, and staying home when we get sick.

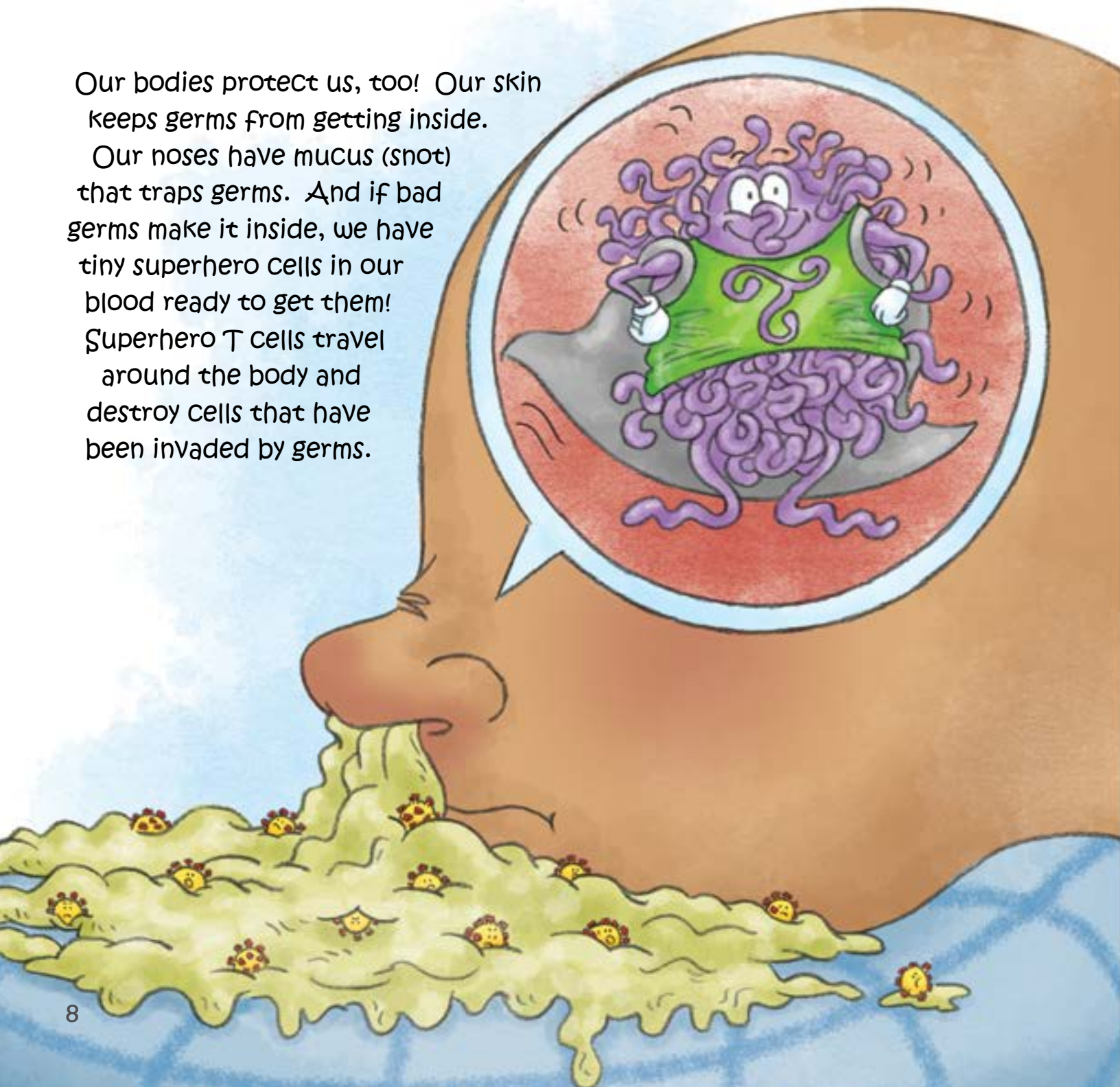






Our bodies protect us, too! Our skin keeps germs from getting inside.

Our noses have mucus (shot) that traps germs. And if bad germs make it inside, we have tiny superhero cells in our blood ready to get them! Superhero T cells travel around the body and destroy cells that have been invaded by germs.



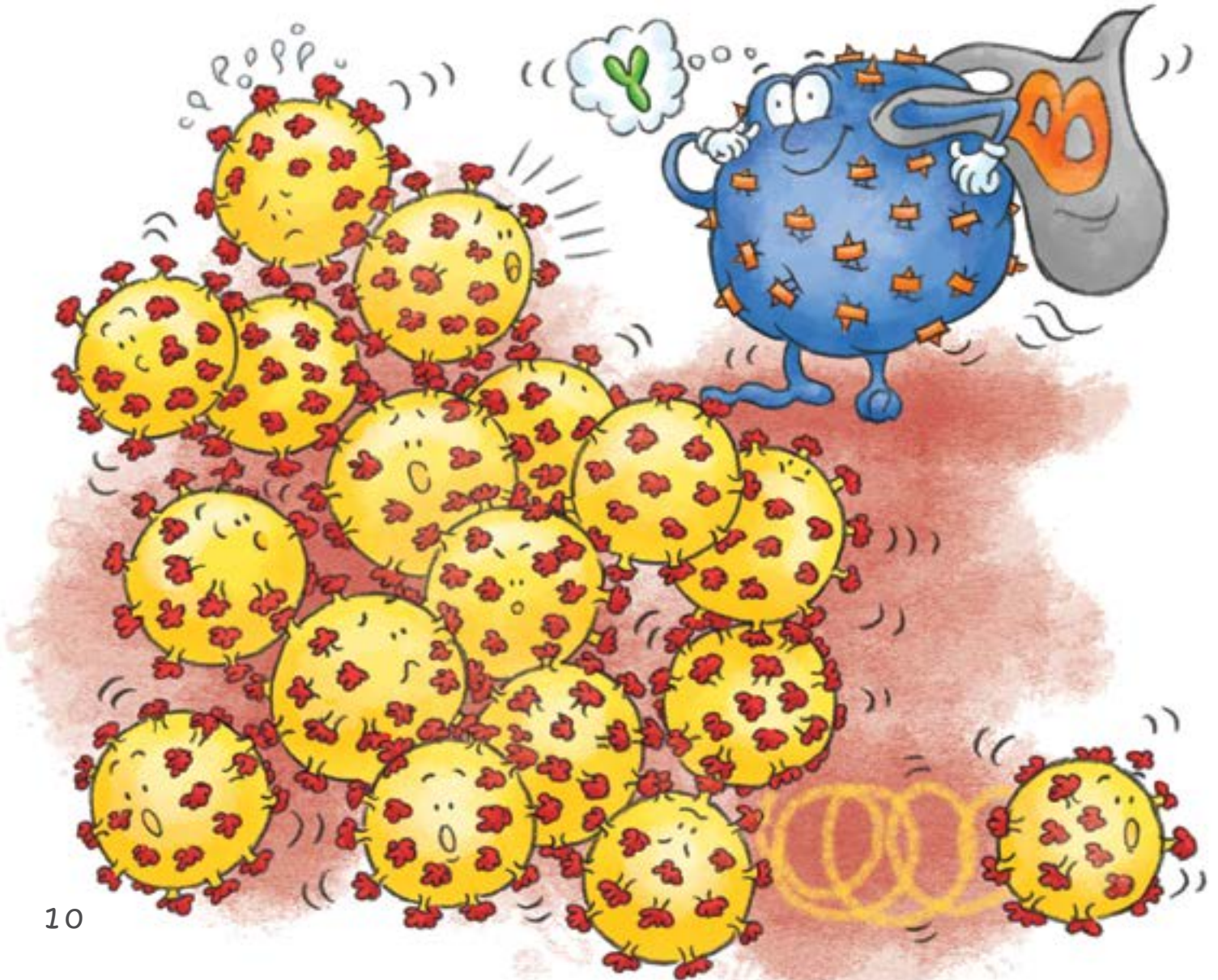


Superhero B cells make germ catchers! When a B cell meets a germ, like the COVID-19 germ, the B cell makes a special germ catcher that only sticks to that germ. These catchers are called antibodies. It's like a game where you get a magic trap that can only catch dragons—the Dragon-Catching Trap.

Now our B cell has COVID-19-Catching Antibodies!



The first time B cells meet a germ, making enough antibodies to fight off the germs takes a long time (weeks). But B cells have a superpower — remembering things! If B cells see a germ they have met before, B cells can act much faster and make a lot of antibodies that can catch those germs!



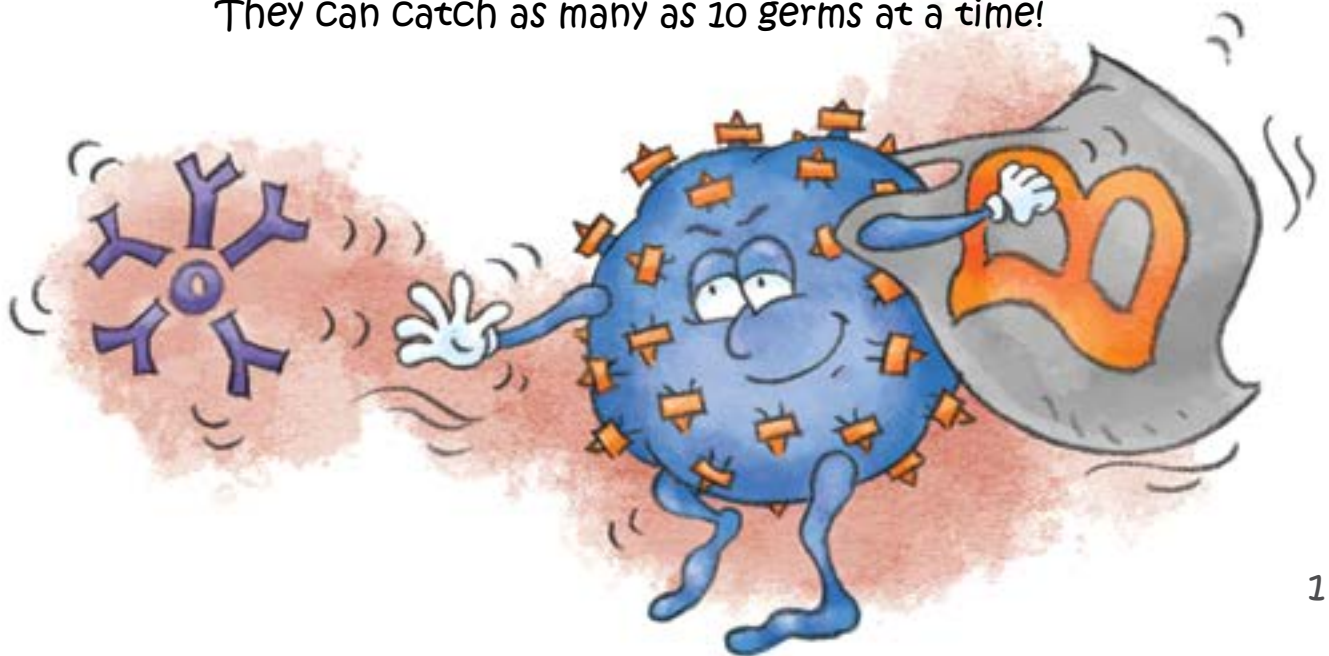


# Germ catchers!

IgG antibodies look like the letter “Y”. They can catch 2 germs at a time!

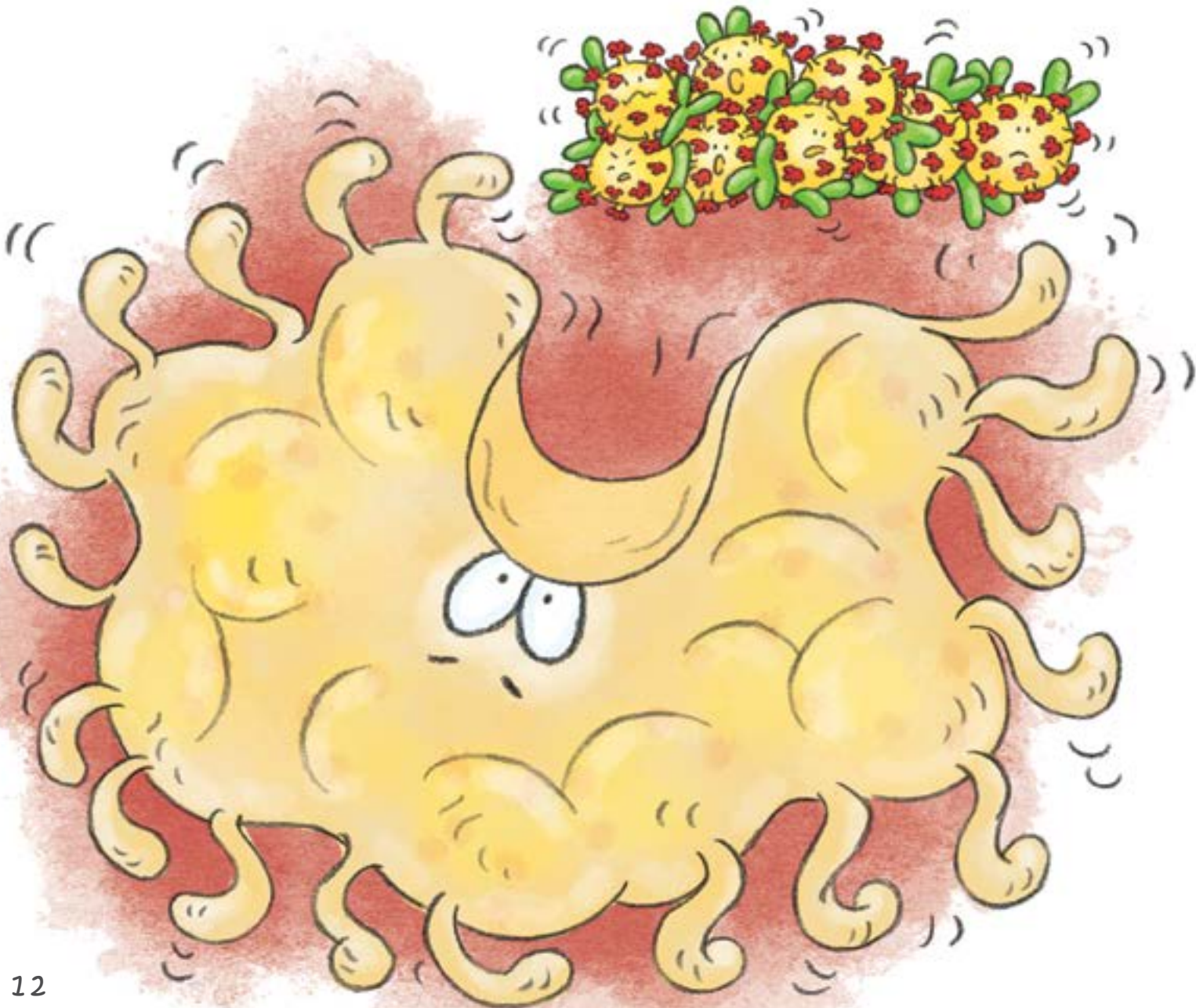


IgM antibodies look like a star made of 5 Ys stuck together. They can catch as many as 10 germs at a time!



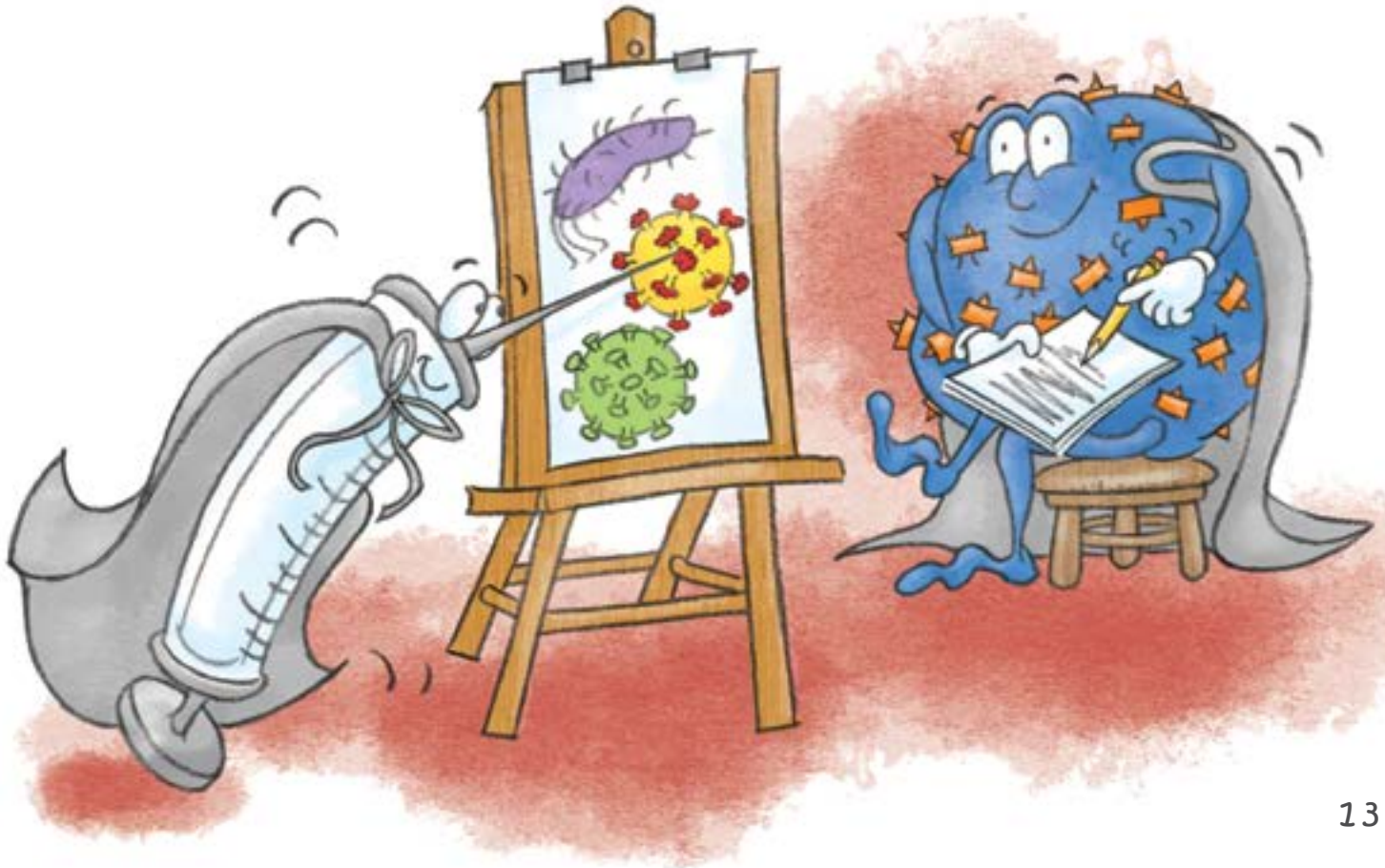


The antibodies stick to germs and hold them still until Superhero Macrophage cells (Big Eaters) come by and gobble up the germs that are all stuck together!



# Why do we need vaccines?

Vaccines power up superhero cells so they can stop germs! B cells can only make germ catchers **AFTER** germs get inside the body. Since no one wants to get sick, scientists discovered vaccines. Vaccines show B cells germ parts or dead germs that can't hurt anyone. Then B cells can make germ catchers **BEFORE** germs get inside. Getting a vaccine more than once (booster shot) helps B cells make even more antibodies!





# Where do vaccines come from?

When new germs appear, like the germ that causes COVID-19, scientists work hard to invent new vaccines to keep people and animals healthy. Some animals like mice, rabbits, and ferrets help scientists invent vaccines.





Before doctors can use new vaccines to keep people and animals healthy, scientists must test the vaccines. Doctors can only use vaccines after the scientists are sure the vaccines are safe and that the vaccines work.



# Who needs vaccines and when?

Vaccines can help everyone and their animals stay healthy!



Babies, even puppies and kittens, get some vaccines. Baby chicks get many vaccines while they are still in the egg!



Vaccines work best if you are vaccinated **BEFORE** you get sick so your superhero cells have time to power up.

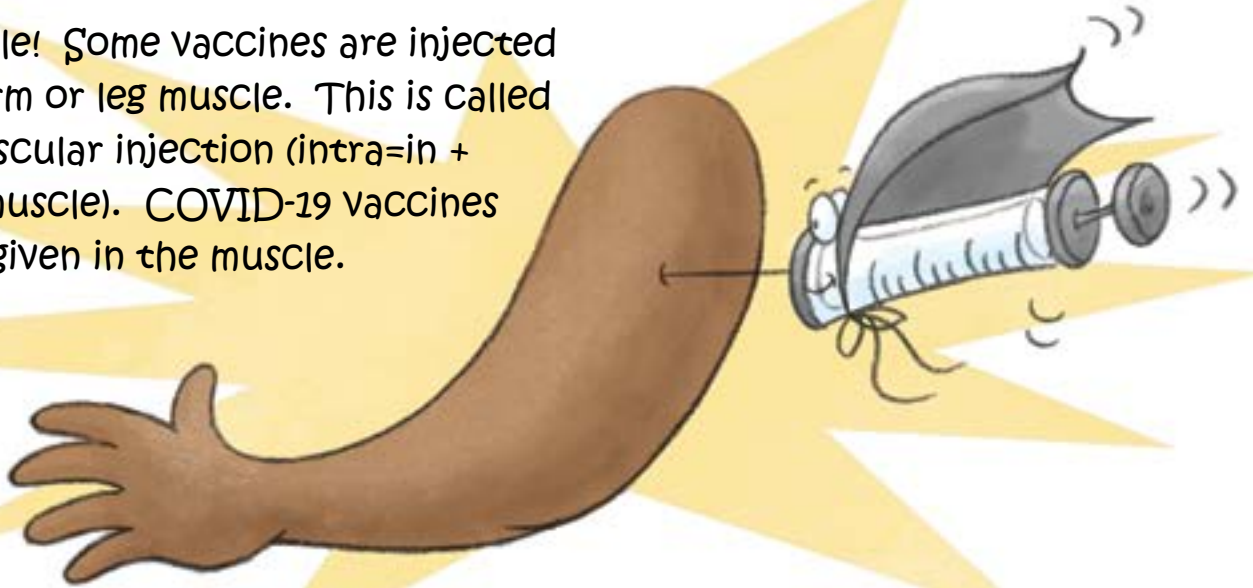




# How are vaccines given?

In the muscle! Some vaccines are injected into your arm or leg muscle. This is called

Intramuscular injection (intra=in + muscular=muscle). COVID-19 vaccines are given in the muscle.



Under the skin! Some vaccines are injected under the skin. This is called subcutaneous injection (sub=under + cutaneous=skin).

The cool way to say this is "SUB-Q".

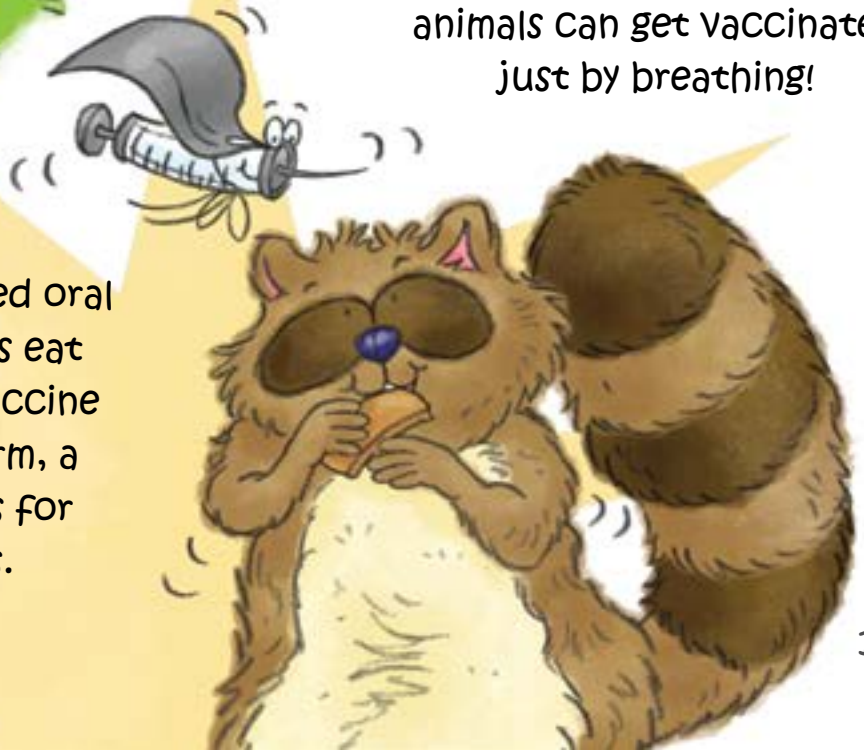


Up the nose! Some vaccines go in the nose. This is called intranasal administration (intra=in + nasal=nose).



Some vaccines get sprayed into the air and people and animals can get vaccinated just by breathing!

In the mouth! These are called oral (mouth) vaccines. Raccoons eat special snacks that have a vaccine inside to stop the rabies germ, a germ that is very dangerous for people and many animals.





# Use your powers for good!

Now you know all about how vaccines work! How will you use your superpowers to keep people and animals healthy?



- ☐ I will tell everyone to get vaccinated.
- ☐ I will be a scientist and invent life-saving vaccines.
- ☐ I will be an animal or people doctor or nurse and give vaccines.

# Even superheroes need vaccines!

Guess what? Getting vaccinated doesn't just protect you! When you get vaccinated, you also protect the people around you.

That's what superheroes do!

The Goat Vet, Dr. Allen Cannedy, got his COVID-19 vaccine! Did you get your vaccine?





# Did you know ... ?

Veterinarian scientists invent COVID-19 vaccines!



“The Vaxinator”, Dr. Harm HogenEsch (right), and “The Virus Fighter”, Dr. Suresh Mittal (left), are veterinary scientists who are working hard to make new and even better vaccines.





# Word Bank

Antibody

Germ

Inject

Intramuscular

Intranasal

Macrophage

Mucus

Subcutaneous

Vaccine

Veterinarian

