DISEASE DETECTIVES

CURRICULUM SCRIPT

OBJECTIVES

Activity participants will be able to:

- Define an outbreak of infection
- Match common symptoms and location with the germ causing the outbreak
- Describe how germs are spread

ENGAGE

Introduce Bacteria, Viruses, and Outbreak of Infection: Ask attendees open-ended questions about germs and use the following bullets to guide conversation.

Define "Germs"

- Germs are tiny organisms that exist all around us but cannot be seen without a microscope. There are several kinds of germs: bacteria, fungi, viruses, and parasites. Today we are going to focus on viruses and bacteria.
    - Germs are also called pathogens when they can cause an infection.
- Some examples of viruses are COVID, the flu, and the common cold. But there are a lot of different kinds of viruses that cause all kinds of sickness, another example is Varicella which causes "chicken pox". Most of the time viruses are not good for you and will make you sick.
- Bacteria are a little different from viruses. There are lots of different bacteria; most of them are good and protect your body. Bacteria live in your nose, on your skin, in your stomach and intestines, really, they live all over you. These are good bacteria that help your body do lots of things, one of which is protect you from bad bacteria that does not normally live with you.
    - An example of a bacteria that does not usually live with you is Salmonella; these bacteria can make you sick if you eat food that isn't cooked all the way or if you don't wash your hands after touching animals that carry Salmonella on their skin, like turtles or lizards.

Define Outbreak of Infection

- When one person is sick with a germ, they have an infection. It is considered an outbreak of infection when many people in the same area are sick from the same germ, specifically more sick people than is normal for that germ, place, or time of year.
- It is really important to figure out what pathogen (germ) is causing an outbreak, and where the outbreak started so that the germ can be stopped and no more people will get sick. This is what an epidemiologist does!

Define Epidemiology/Epidemiologist

- An epidemiologist is a person whose job is to be a Disease Detective. There are many types of epidemiologists. An infectious diseases epidemiologist investigates the clues that are left behind when an outbreak of infection happens.

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EXPLAIN & ELABORATE

Explain and Play the Game

Game Instructions (for moderator):

- **Set Up:** Coat hands with GloGerm if incorporating the optional activity. Create 4 distinct "station" areas in the room using tables or places resources on the floor in different corners of the room. Use the table tents to mark each "station". Distribute the applicable cards for each location and ensure that you are only using one case from the Outbreak deck at a time.
- **Activity:** Read the selected case from the Outbreak deck to set the kids off on their investigation. Move through each station in the following order: Identification Station, Investigation Station, Treatment Station, and Prevention and Response Station. Pause at each station and discuss key topics BEFORE asking the kids to choose the right answer for the Investigation Board. Once they have the right answer, use that card and add it to the answer board so that the whole narrative is displayed by the end. At the conclusion of the Prevention and Response Station, gather everyone back together to review the answers to the investigation.
- **Station Discussions** – pause to discuss before sending the kids to interact with the station to reaffirm what is discussed about each station. Once the kids select the correct answer from the station, add the card to the Investigation (Answer) Board.
- **Identification Station:** use the Pathogen deck to match the possible pathogens with the symptom description from the case
    - There are 3 suspect germs, also called pathogens, that could have caused our outbreak:
    - Influenza, a virus also called the flu, which causes fever, sore throat, tiredness, and cough
    - Salmonella, bacteria that cause upset stomach, throwing up, diarrhea, and fever
    - Varicella, a virus also called Chicken Pox, which causes an itchy rash (red spots) all over the body, fever, and tiredness
- Which one of these suspects matches most closely with the outbreak we are investigating? Check the card on the Investigation board if you need a reminder.

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- **Investigation Station:** Use the rest of the cards in the Outbreak deck that correspond with the selected case. (Note: If playing with case #2, hold back the food cards and only share them with the kids AFTER they have discovered the location)
    - We now know what germ is causing the outbreak, but now we need to figure out where it started. The place that the kids got sick will be the place that they all went to. Look at these cards that tell you where each sick kid has been. Place one of the tokens on the map for each spot a sick kid has been.
    - Look at the map, which place have the kids all been at? That is where the outbreak started.
- **Treatment Station:** Use the cards in the Treatment deck to match the treatment with the pathogen from the case, take care to explain each option well before having the kids pick the right answer so that they notice the clues pointing them to the correct treatment.
    - Antibiotics – this type of medicine is for treating a bacterial infection that the body cannot take care of on its own. Not all infections from bacteria always need antibiotics. Doctors can help you make the decision if an antibiotic will help.
    - Antivirals – this type of medicine can treat certain types of infections caused by a virus. The flu (influenza) is a virus that has an antiviral.
    - Symptom Treatment Only – most of the time viruses and bacteria (like Salmonella) that the body can handle actually just need "symptom treatment" which means taking medicines that help the symptoms like fever or throwing up while you wait for your body to get rid of the germ.
- **Prevention and Response Station:** Use the cards in the Prevention and Response deck to discuss all of the ways that they can practice healthy infection prevention habits that will stop or slow the spread of germs and prevent outbreaks in the future. Prompt the kids to explain why they chose that card or help them understand how it is relevant. Most cards can be applied to each scenario.
    - Look through all of the cards and pick out the things you could do that would stop the spread of the germ that caused our outbreak.

DISEASE DETECTIVES

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OPTIONAL: GloGerm Visual

- For one last activity about bacteria and viruses, we want to show you just how easy it is to spread germs. So, we were a little sneaky when setting up for today's lesson! We used GloGerm powder on our hands before setting up and teaching. This is a completely safe powder that is a good visual for how germs, like bacteria and viruses, spread, it is not real germs. It can't be seen just looking at it with your eyes, but once we turn out most of the lights and shine a black light on it, then you can see it.
- We are going to see how many "germs" you got from playing the game today!
    - **Moderator:** have the kids line up and then turn out the lights and shine the black light on their hands to show where the powder they picked up glows.
- This is a good example because you can't see the pathogens you are sharing with one another, but you are doing so, just as easily as you shared the GloGerm with each other and got it from the game. **This is why it is important to wash your hands or use hand sanitizer often.**
- Now, if you want to see how magically handwashing and hand sanitizer works, go clean your hands and then come back to see how much GloGerm is gone!
    - If you do a good job, then you shouldn't be able to see any more when you come back to look under the blacklight.

EVALUATE

Check in with attendees to see what knowledge was retained by asking questions that support what they've learned.

- Who knows what a germ is?
- Do all germs make you sick?
- What helps stop germs?
- What was something new you learned today?
- How can we help our friends and family stay healthy?

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ANSWER KEY

For moderators, the following are the correct answers associated with each case and the subsequent stations.

- **Case # 1**
  - **Pathogen:** Influenza (flu)
  - **Source:** School
  - **Treatment:** Antivirals
  - **Prevention:** No truly wrong answer except animal safety and proper food storage/cooking, but ask them to explain why it is a correct answer. Influenza is spread by droplets, so the best answers are those that promote cleaning surfaces, handwashing, covering cough, not sharing food, and other ways that prevent the spread of droplets.
- **Case # 2**
  - **Pathogen:** Salmonella
  - **Source:** Birthday Party in the Park
  - **Food source:** Potato Salad
  - **Treatment:** Symptomatic treatment only (it is a bacterial pathogen, but antibiotics are not needed for treatment)
  - **Prevention:** No truly wrong answer, but ask them to explain why it is a correct answer
- **Case # 3**
  - **Pathogen:** Varicella (Chicken Pox)
  - **Source:** Indoor Playground
  - **Treatment:** Symptomatic treatment only (the symptom treatment has a comment about Salmonella, explain that this comment is true but for a different case)
  - **Prevention:** No truly wrong answer except animal safety and proper food storage/cooking, but ask them to explain why it is a correct answer. Varicella is spread by contact with the rash, so the best answers are those that promote cleaning surfaces, handwashing, staying home when sick, and other ways that prevent the spread of germs through contact with a rash or surfaces exposed to Varicella.

INVESTIGATION STATION

INDOOR PLAYGROUND

SCHOOL

BASKETBALL GYMNASIUM

MALL

SOCCER FIELD

GROCERY STORE

LIBRARY

MUSEUM

PARK

supermarket

ENTRANCE


OUTBREAK

CASE №1

Several kids in 3rd grade are out sick. Everyone who is out sick has reported fever, sore throat, tiredness and cough.

Can you figure out what germ caused the outbreak and how the students got sick?

CASE №2

Several kids are sick with upset stomach, throwing up, diarrhea, and fever.

Can you figure out what germ is making kids sick and where they got it from?

CASE №3

Several kids have noticed an itchy rash (red spots) all over their body, fever, and tiredness.

Can you figure out what germ is making kids sick and where they got it from?

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №1

Basketball Game

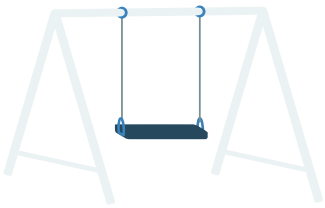
Grocery Store

School

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №2



Park

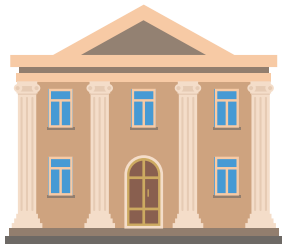
School

Mall

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №3



Children's Museum

Library

School

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №4

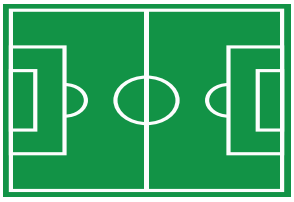
School

Home

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №5



Soccer Practice

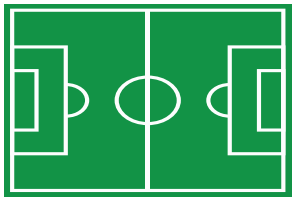
Friend's House

School

CASE №1

Fever, Sore Throat, Tiredness and Cough

SICK KID №6



After-School Program

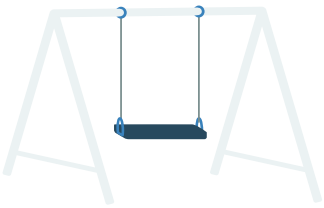
School

Bus Ride

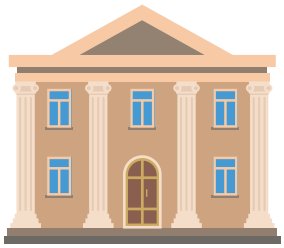
CASE №2

Upset Stomach, Diarrhea, Throwing Up, and Fever

SICK KID №1



Birthday Party (Park)



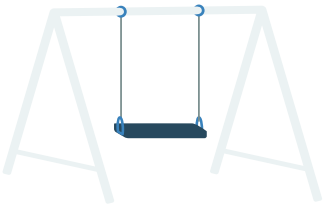
Children's Museum

CASE №2

Upset Stomach, Diarrhea, Throwing Up, and Fever

SICK KID №2

Mall



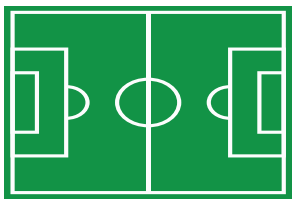
Birthday Party (Park)

CASE №2

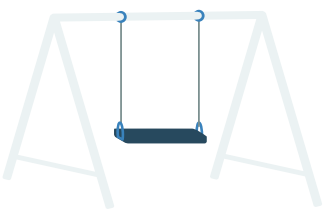
Upset Stomach, Diarrhea, Throwing Up, and Fever

SICK KID №3

Library



Summer School Program

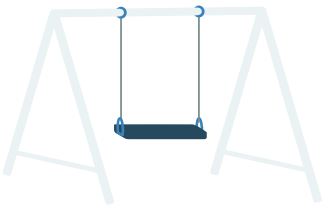


Birthday Party (Park)

CASE №2

Upset Stomach, Diarrhea, Throwing Up, and Fever

SICK KID №4



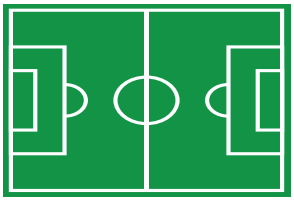
Birthday Party (Park)

Grocery Store

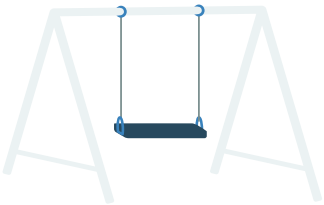
CASE №2

Upset Stomach, Diarrhea, Throwing Up, and Fever

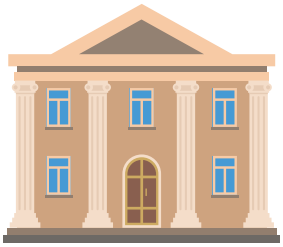
SICK KID №5



Soccer Practice



Birthday Party (Park)

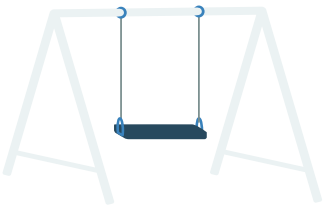


Children's Museum

CASE №2

Upset Stomach, Diarrhea, Throwing Up, and Fever

SICK KID №6



Birthday Party (Park)

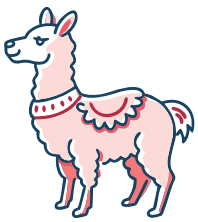
Friend's House

CASE №2

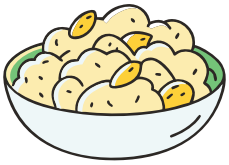
How did the Salmonella outbreak start?

BIRTHDAY PARTY CLUES

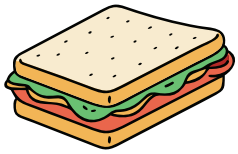
SICK KID №1



Petting Zoo



Potato Salad



Sandwich

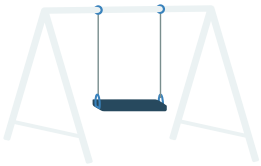
Cake

CASE №2

How did the Salmonella outbreak start?

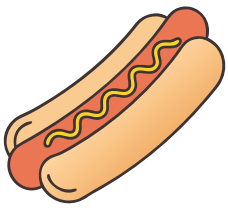
BIRTHDAY PARTY CLUES

SICK KID №2



Playground

Potato Salad



Hot Dog

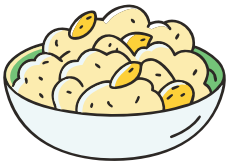
Cookie

CASE №2

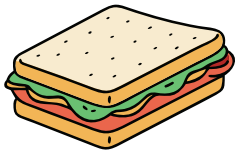
How did the Salmonella outbreak start?

BIRTHDAY PARTY CLUES

SICK KID №3



Potato Salad



Sandwich

Cookies

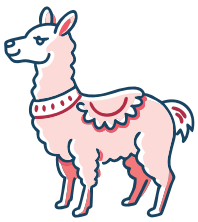
Cake

CASE №2

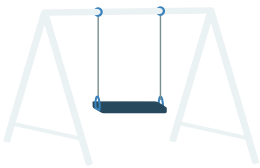
How did the Salmonella outbreak start?

BIRTHDAY PARTY CLUES

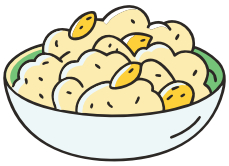
SICK KID №4



Petting Zoo



Playground



Potato Salad

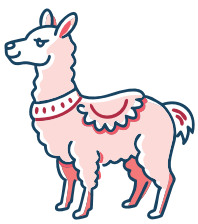
Cookies

CASE №2

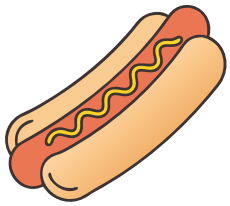
How did the Salmonella outbreak start?

BIRTHDAY PARTY CLUES

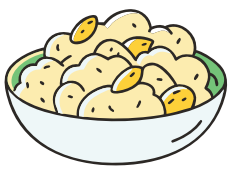
SICK KID №5



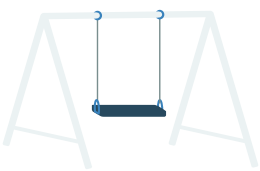
Petting Zoo



Hot Dog



Potato Salad



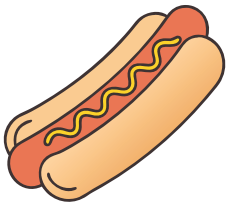
Playground

CASE №2

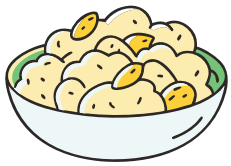
How did the Salmonella outbreak start?

BIRTHDAY PARTY CLUES

SICK KID №6

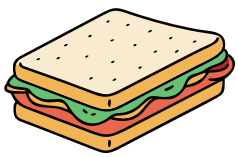


Hot Dog



Potato Salad

Cake



Sandwich

CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

SICK KID №1

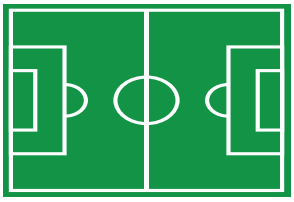
Indoor Playground

Basketball Game

CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

SICK KID №2



Soccer Practice

Indoor Playground

CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

SICK KID №3

Friend's House

Indoor Playground

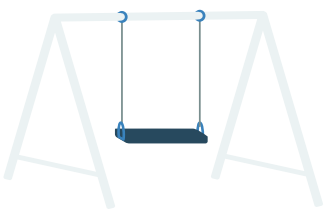
CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

SICK KID №4

Library

Indoor Playground



Park

CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

SICK KID №5

Mall

Indoor Playground

CASE №3

Itchy Rash (Red Spots), Fever, and Tiredness

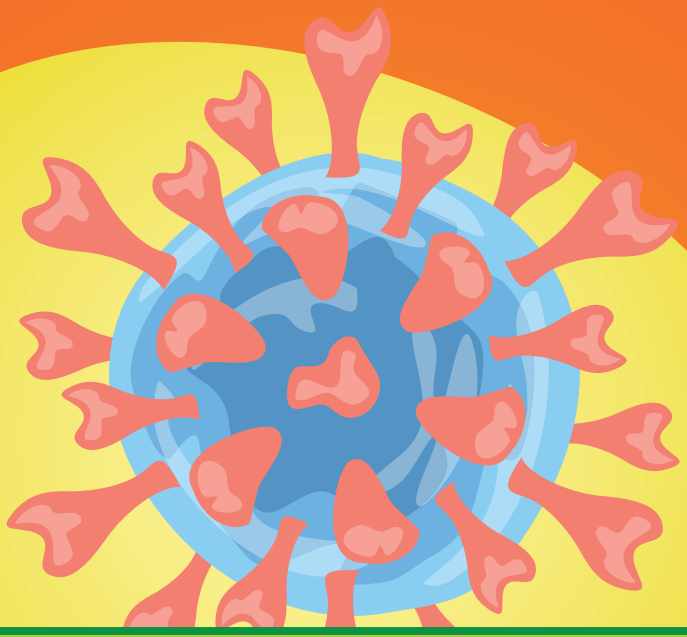
SICK KID №6

Indoor Playground

Grocery Store

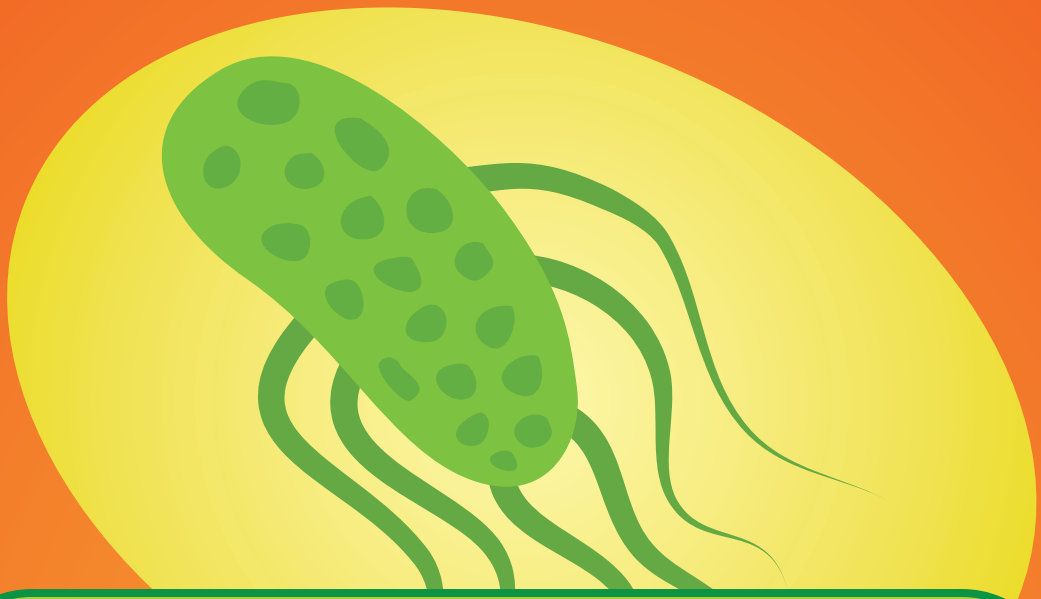
Friend's House


PATHOGEN



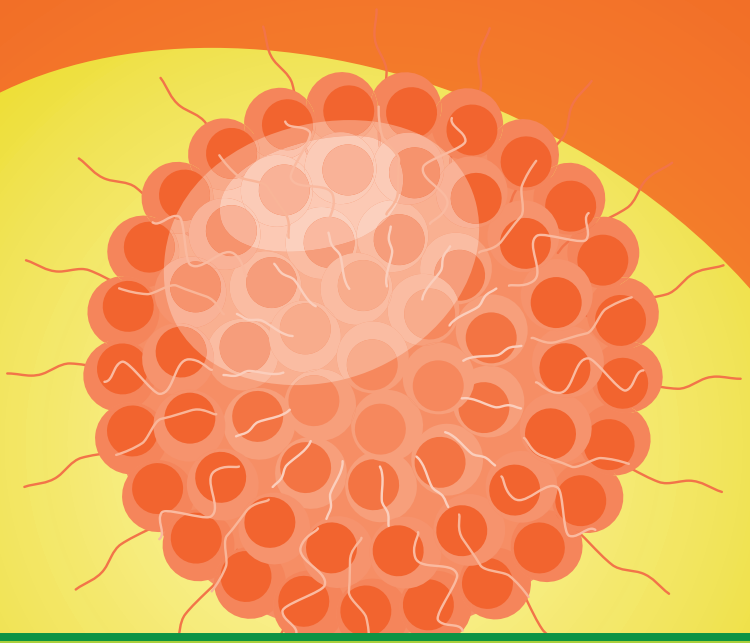
INFLUENZA

Symptoms:
fever, sore throat,
tiredness, and cough



SALMONELLA

Symptoms:
upset stomach, throwing up, diarrhea, and fever



VARICELLA (CHICKEN POX)

Symptoms:
Itchy rash (red spots) all over the body, fever, and tiredness


PREVENTION
AND
RESPONSE

HANDWASHING

Wash hands for at least 20 seconds

CLEANING & HYGIENE

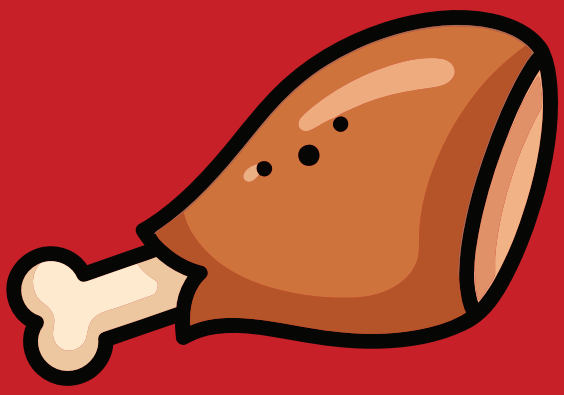
Wipe shared surfaces

CLEANING & HYGIENE

Cover coughs/sneezes

CLEANING & HYGIENE

Use hand sanitizer



COOK FOOD FULLY

FOOD SAFETY

Cook food fully

FOOD SAFETY

Keep foods at
safe temperature

FOOD SAFETY

Don’t share food or drinks

STAY HOME WHEN SICK

Check temperature. Fevers are a sign to stay home

ANIMAL SAFETY

Wash hands after
touching reptiles

ANIMAL SAFETY

Don’t touch wild animals

AVOID TOUCHING YOUR FACE

PERSONAL HABITS

Don’t touch eyes/nose/mouth

PERSONAL HABITS

Respect personal space


TREATMENT

ANTIBIOTICS

Treats bacterial infections when the body can't take care of them on its own

ANTIVIRALS

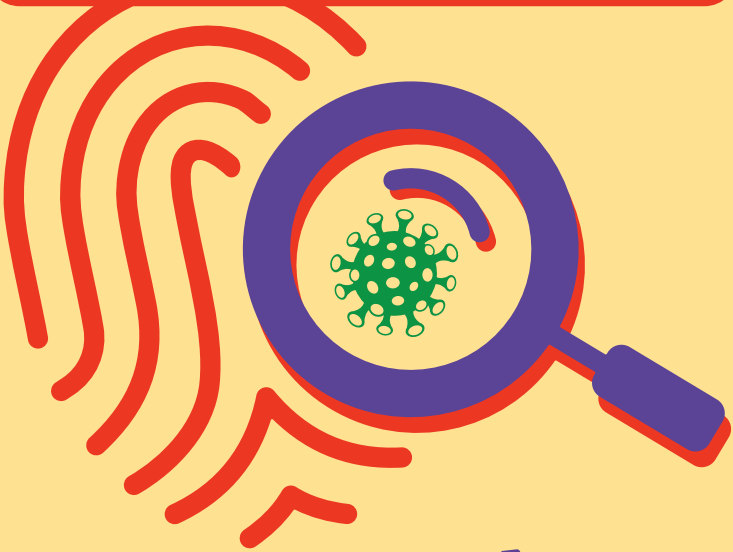
Treats certain viral infections such as Influenza

SYMPTOM TREATMENT ONLY

Medicine for fever and cough, hydration (drink water), rest

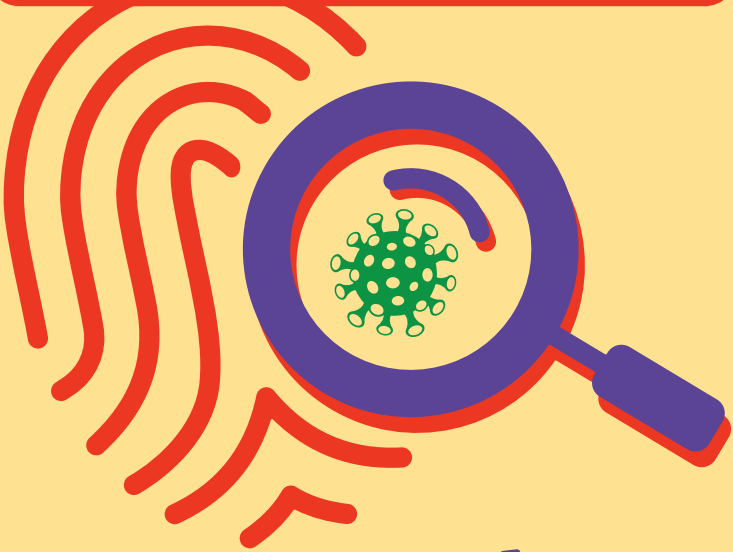
For Salmonella usually symptom treatment only for GI symptoms (throwing up and diarrhea)

IDENTIFICATION STATION



DISEASE DETECTIVES

IDENTIFICATION STATION



DISEASE DETECTIVES

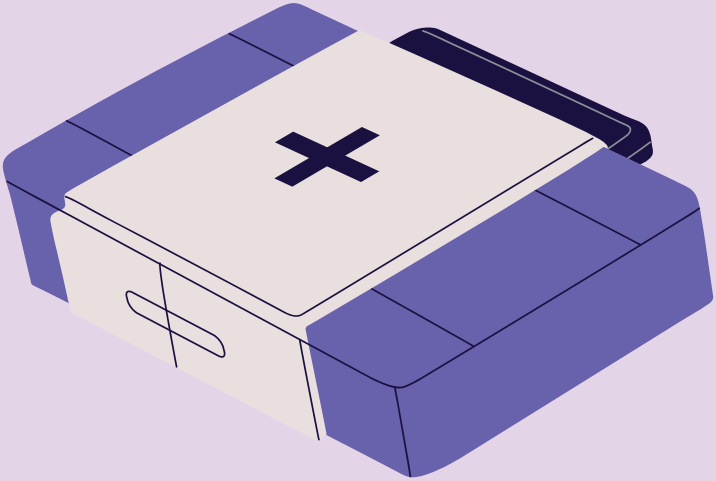
INVESTIGATION STATION

DISEASE DETECTIVES

INVESTIGATION STATION

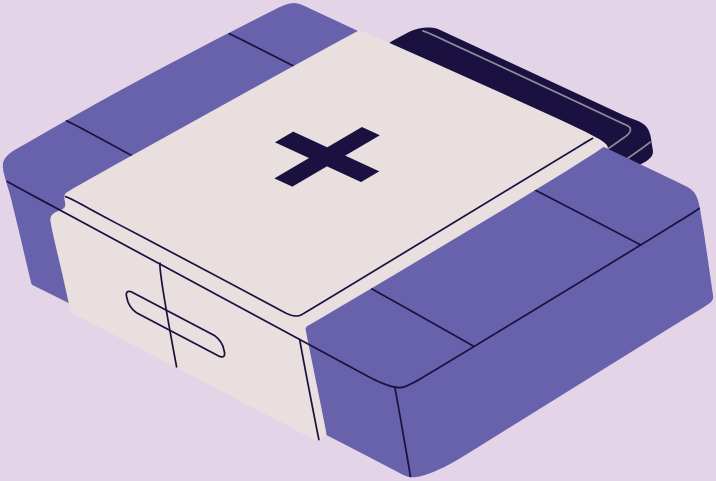
DISEASE DETECTIVES

TREATMENT STATION



DISEASE DETECTIVES

TREATMENT STATION



DISEASE DETECTIVES

PREVENTION AND RESPONSE STATION

DISEASE DETECTIVES

PREVENTION AND RESPONSE STATION

DISEASE DETECTIVES


PATHOGEN


SOURCE
LIBRARY


TREATMENT

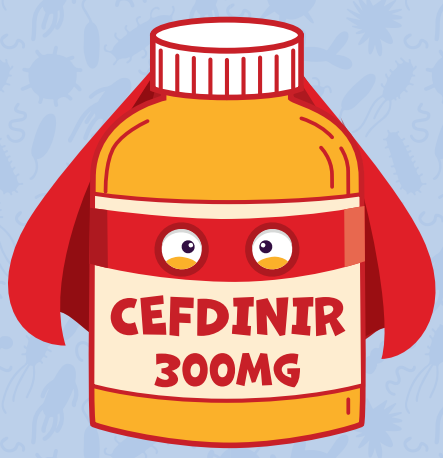

PREVENTION

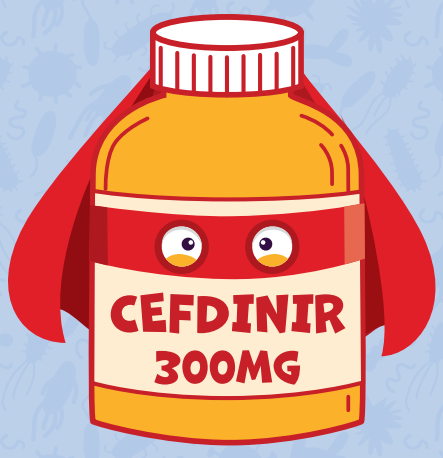

MEROPENEM
FOR INJECTION
1 GRAM


MEROPENEM
FOR INJECTION
1 GRAM

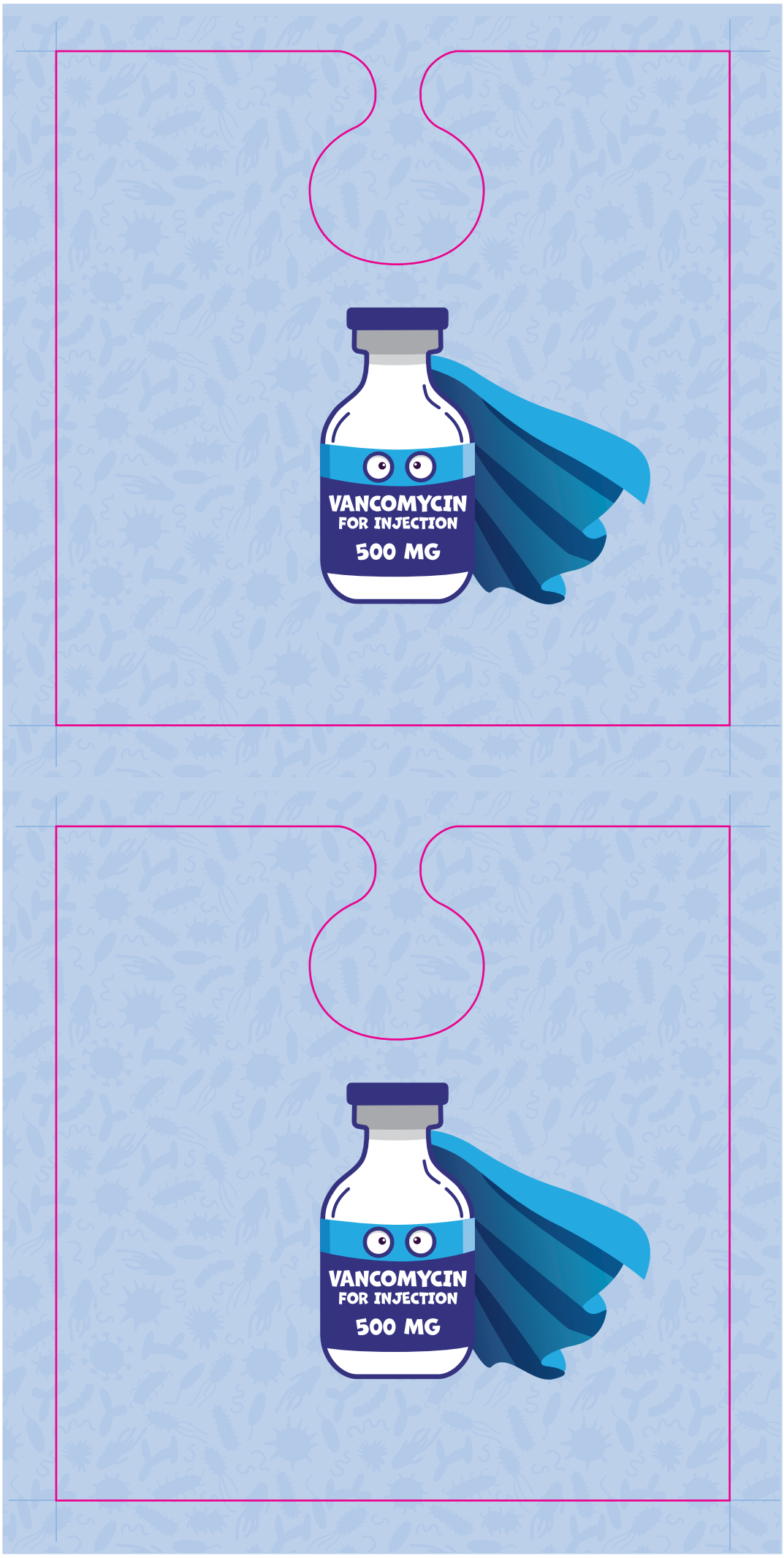

BACTRIM
50 ML

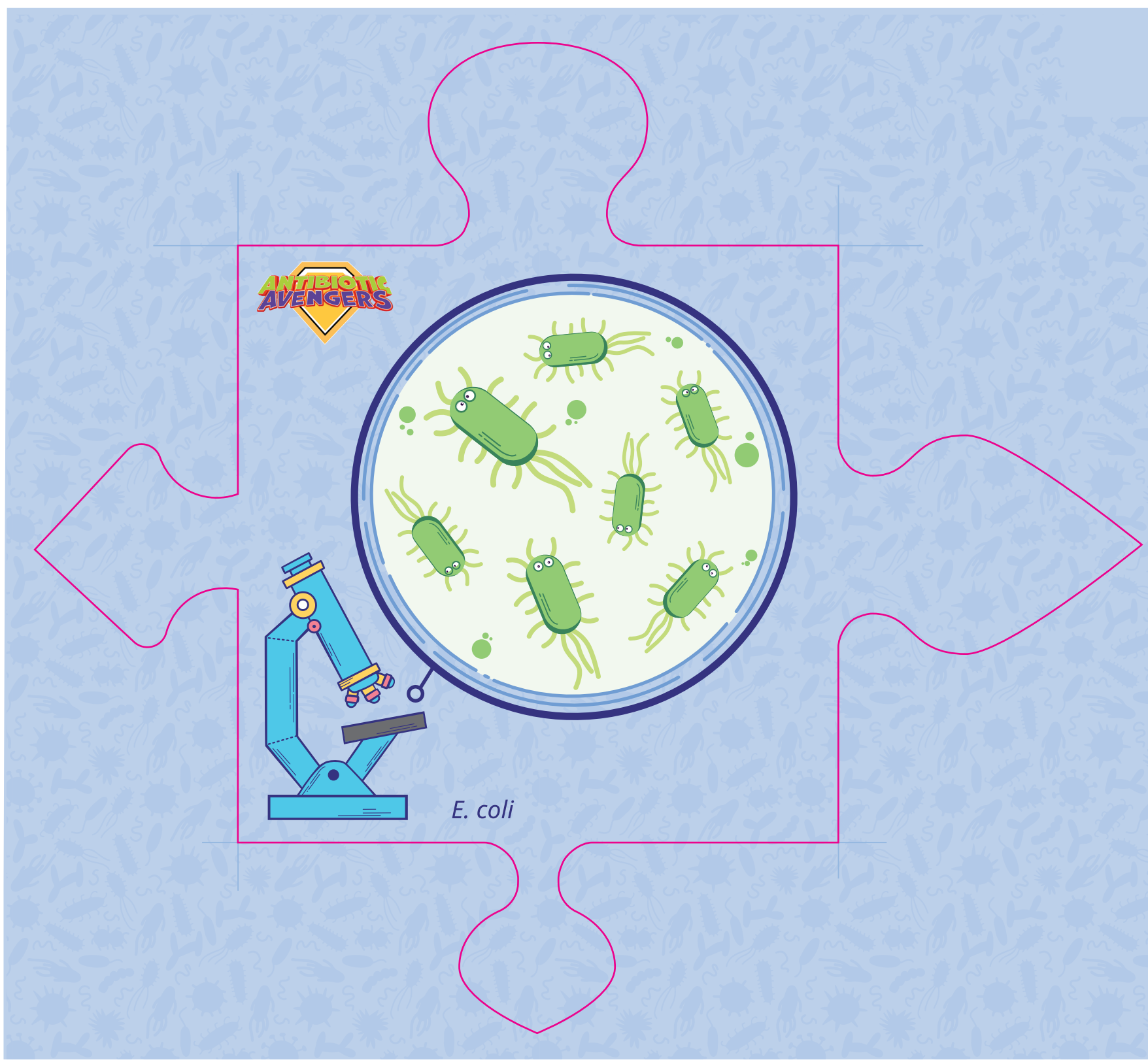

CEFDINIR
300MG

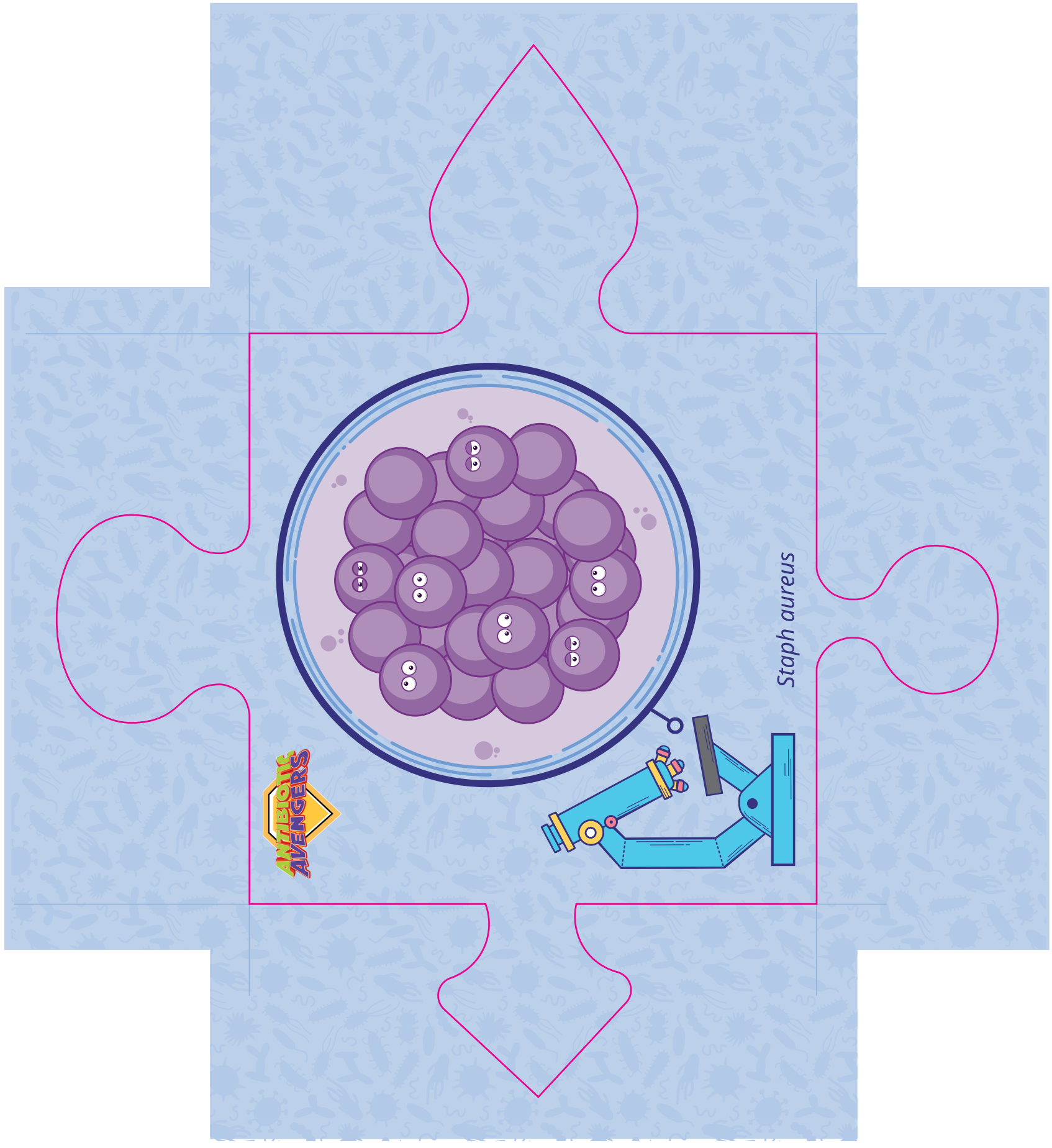

CEFDINIR
300MG

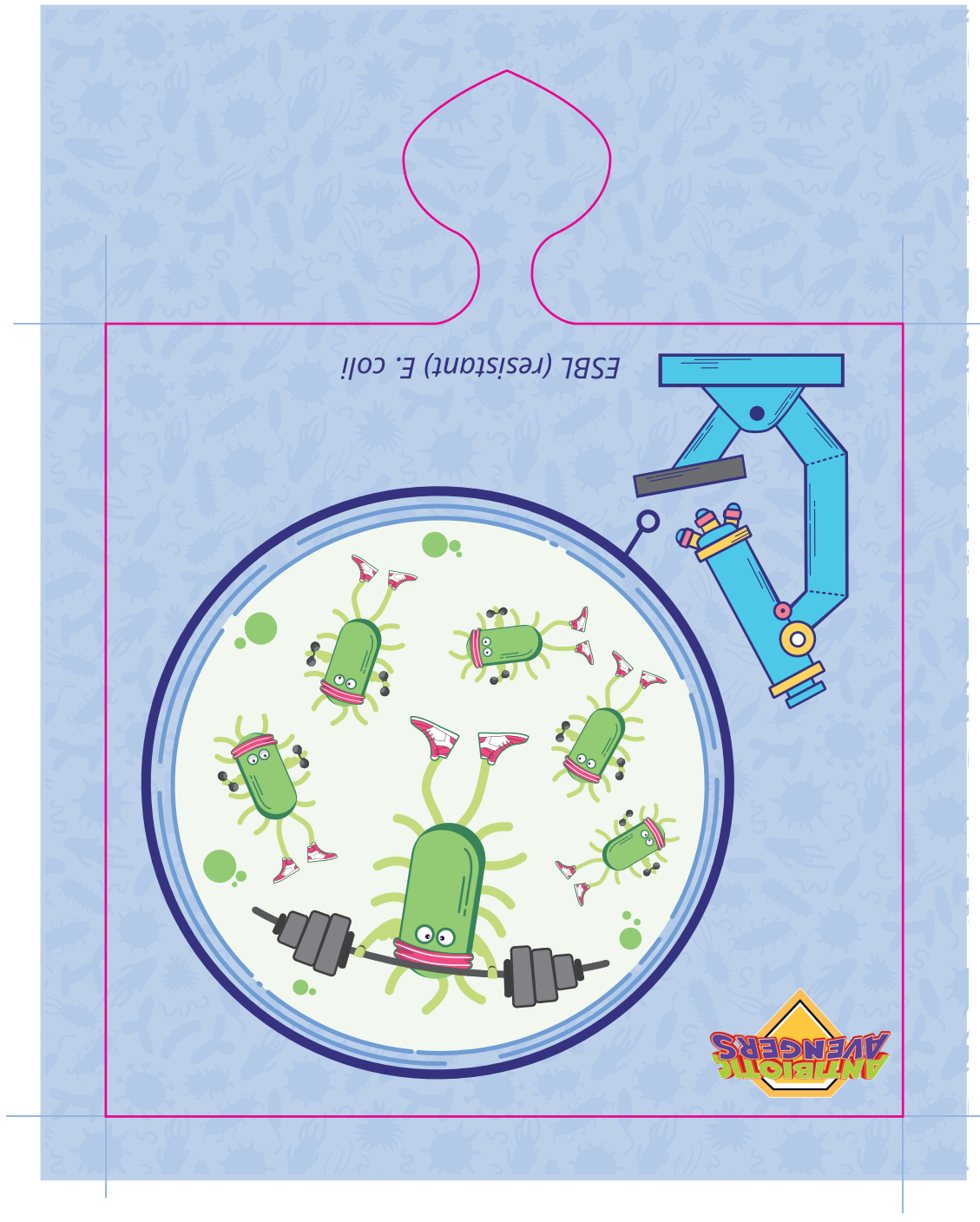

CEFDINIR
300MG


AUGMENTIN
457MG
5 ML

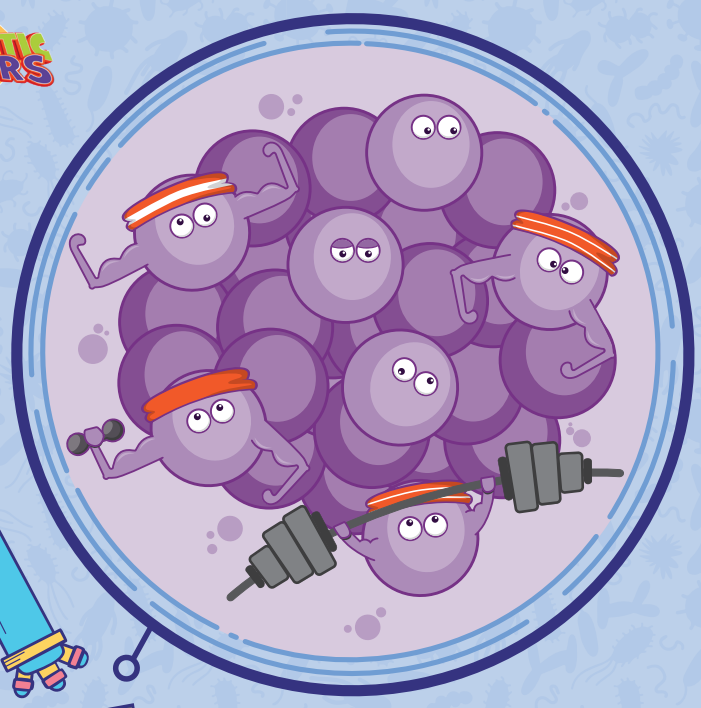

VANCOMYCIN
FOR INJECTION
500 MG
VANCOMYCIN
FOR INJECTION
500 MG

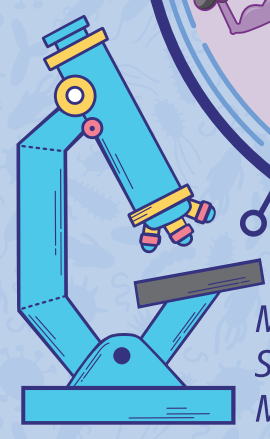

ANTIBIOTIC AVENGERS
E. coli


Staph aureus
ANTIBIOTIC AVENGERS


ESBL (resistant) E. coli
ANTIBIOTIC AVENGERS

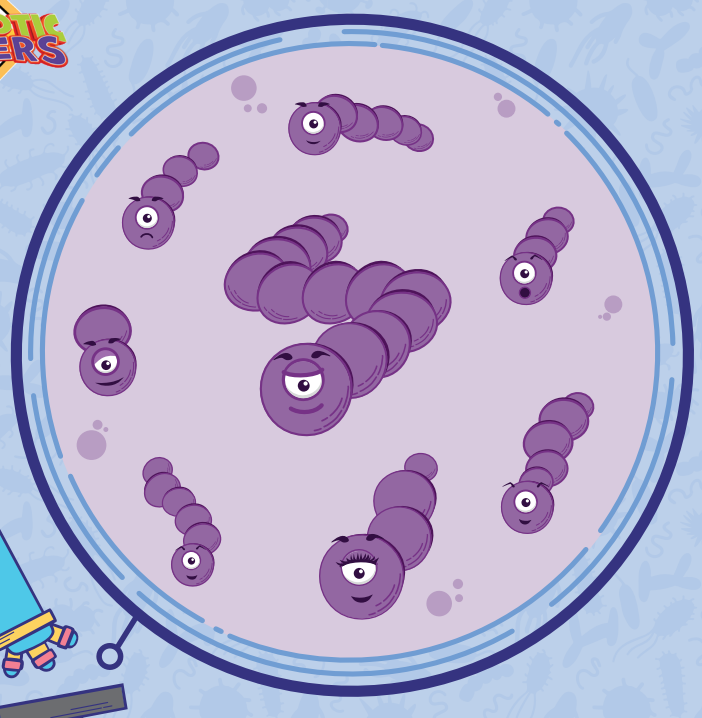
ANTIBIOTIC AVENGERS

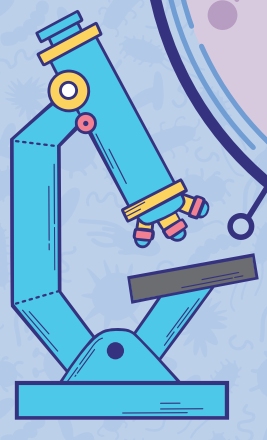




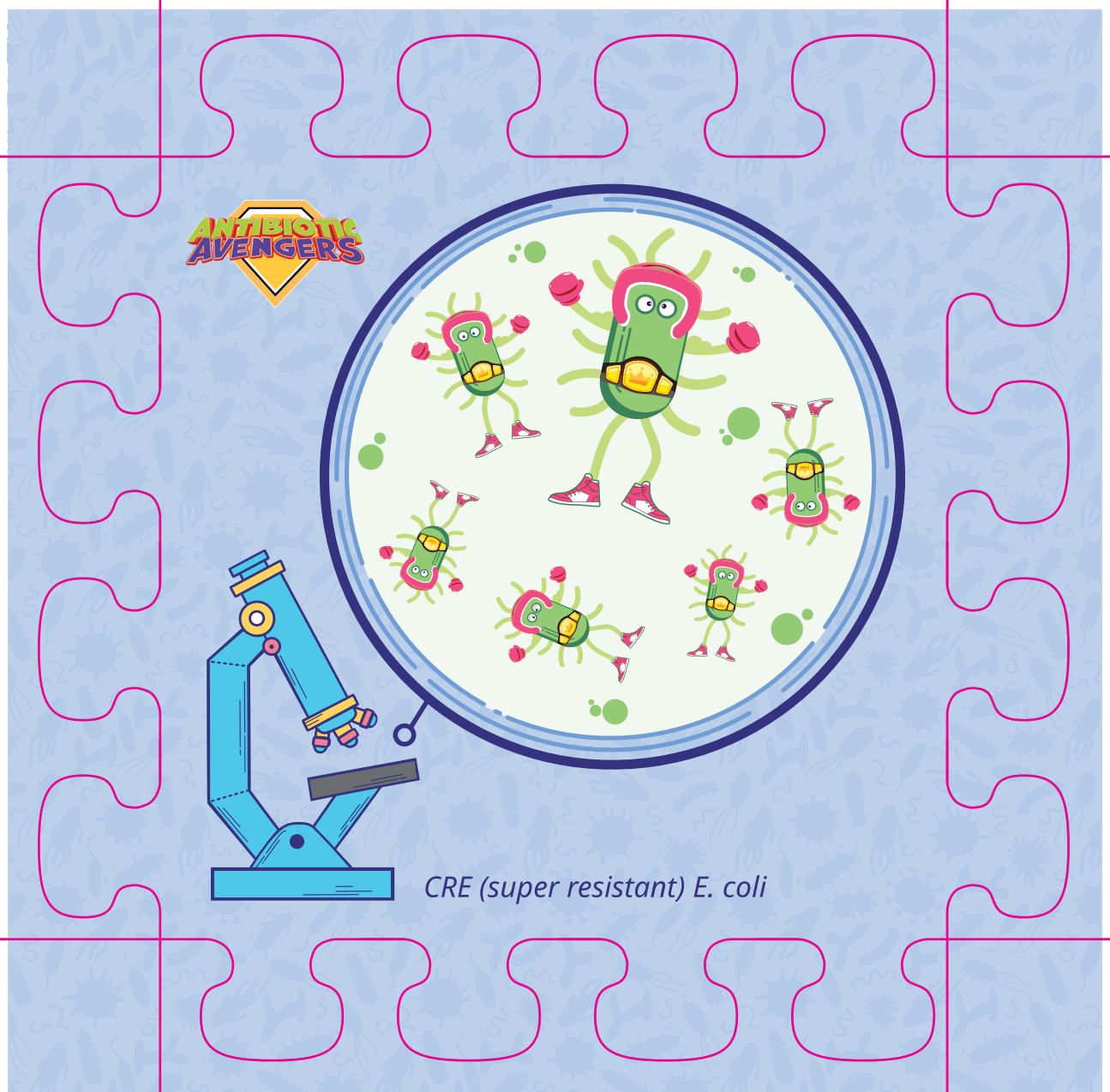
Methicillin Resistant
Staphylococcus Aureus
MRSA (resistant)

ANTIBIOTIC AVENGERS





Streptococcus pneumoniae



CRE (super resistant) E. coli