

2,000 Sq. Ft. Traveling Exhibition

EXHIBIT DESCRIPTION

Did you know trillions of microbes make their homes inside your body? In fact, these non-human organisms outnumber our human cells 10 to 1, “colonize” us right from birth, and are so interwoven into our existence that without each other, none of us would survive!

Thanks to new sophisticated technology and the cutting-edge research of the National Institutes of Health’s Human Microbiome Project, we are just starting to discover what these microbes are up to and how they affect us. And now in *Zoo in You*, a 2,000 sq. ft. bilingual (English and Spanish) exhibit funded by a Science Education Partnership Award (SEPA) from NIH, we can explore this fascinating and complex world inside us that is our microbiome—a dynamic, adaptable, and delicately balanced ecosystem much like any other found in nature.

In *Zoo in You*, you’ll meet the good microbes that aid digestion or crowd out less friendly freeloaders and also the bad ones that may trigger disease. You’ll learn who our constant microbial companions are, where they live, how diverse they are, and in what ways scientists are discovering just how important they are to our personal health. You can explore this vibrant world of our inner microorganisms through engaging, interactive exhibits and programs such as a bilingual website and science cafes for adult audiences.



Zoo in You has three thematic areas: Meet the Microbes, Our Complex Ecosystems, and Exploring our Microbiome, and includes the following exhibit components.

MEET THE MICROBES



Introduction: What's Your Inner Life Like?

What are these trillions of creatures that reside on and in you and where do they all live? In this introductory exhibit, come face-to-face with the fact that you are made up of tiny organisms as you see yourself reflected in two mirrored panels covered by 48 small colorful microbe disks. Spin the disks to reveal the four major types of microbes (bacteria, archaea, fungi and viruses) and discover interesting factoids about these creatures. In addition, you'll learn what parts of your body they inhabit. The disks are organized so they roughly reflect the ratios of microbe types in the body: lots of bacteria and viruses, a medium number of fungi, and a smaller number of archaea. *Age range: Kindergarten – Adult; Exhibit Interface: Mechanical*

Microbes in the News: What Do You Think?

On the back side of *What's Your Inner Life Like?*, you can read various news articles about surprising new insights on current microbiome research. In addition, you can also contribute creative ideas to share with other visitors on a talk-back board. News stories can be updated by each hosting museum. The data from the Human Microbiome Project has led to many new research topics. In fact, we're still trying to figure out what questions to ask!

Age Range: Grade 4 – Adult; Exhibit Interface: Bulletin Board



How Tiny Are Your Microbes?

Zoom down to the microscopic level with this computer interface and explore how much smaller our microbe companions are than our own human cells. Using a slider mechanism, move through 3-D images of a human blood cell and then further down through a selection of our "normal flora" (fungi, bacteria, archaea, and viruses) to get a sense of the different sizes and structures of the microbes in our bodies. You'll be surprised by the diversity of life on that tiny scale.

Age Range: Kindergarten – Adult; Exhibit Interface: Mechanical/Computer



Could You Survive Without Your Microbes?

In this puzzle, discover that our bodies need “good” microbes to help with certain essential functions. Insert microbe-shaped blocks into a large silhouette of the upper part of the human body. There are (6) strategic locations (forehead, mouth, armpit, and three areas of the gut), which highlight vital daily functions such as digesting food, training immune systems, regulating mood, etc. See if you can guess which microbes go where by looking at the different clues and various shapes of the puzzle pieces. *Age Range: Grade 4 – Adult; Exhibit Interface: Mechanical*

Are You More Than Human?

See your microbial reflection in this full-body Kinects-style game and watch as your personal microbiome reacts to everyday occurrences. A large screen mirrors your movements as tiny dots and squiggles that represent your microbiome (the sum of all the microbes living in your body). As you move around, waving, jumping, dancing, etc., your microbiome-avatar moves with you. Interact with a range of everyday objects (food, beverages, pets, clothing, toothbrush, Kleenex, toilet paper, etc.) that set off playful sound effects, and see how these items can affect your microbiome. Your body is full of active, dynamic microbes that are affected by your actions and environment. *Age Range: Kindergarten – Adult; Exhibit Interface: Computer/Electronic/Video*



Where Did Your Microbiome Come From?

Manipulate a tilt table maze to learn how a newborn baby is first colonized by microbes and discover that not only do we coexist with these organisms from the moment we are born, but our microbiomes



get more diverse as we grow up. In this challenging full-body activity, up to (4) players work together to tilt a table in different directions, guiding a ball into (6) targets as quickly as possible in the allotted time. Each target represents a way in which a newborn baby builds its microbiome. The goal of the game is to “collect” the microbes that will help build the baby’s immune system, by hitting all (6) targets. A scoreboard keeps tally and counts down the remaining time left in the game. See if you and your teammates can achieve a high “microbial score” by triggering all (6) sensors. *Age Range: Grade 4 – Adult; Exhibit Interface: Mechanical/Electronic/Audio*

OUR COMPLEX ECOSYSTEMS

How's The Weather Inside Your Body?

Our bodies are composed of many distinct micro-habitats, which in turn affect the types of microbes that can colonize these different areas. Interact with green screen technology to deliver a “weather report” on the climate conditions of the different micro-habitats of the human body. In this full-body activity, you’re the expert reporter, telling the world what it’s like inside certain body areas. As you enter the “recording studio,” first push a button to select the desired body part (nose, mouth, skin, or gut), then while standing in front of the green screen, read a script from the teleprompter. At the same time, you can watch yourself superimposed on a close-up of the selected body area on

a second monitor, while your friends can view your broadcast on a third monitor. *Age Range: Grade 4 – Adult; Exhibit Interface: Computer/Electronic/Video/Audio*

How Do Your Microbes Protect You?

Your gut needs a broad diversity of organisms in order to be healthy. See if you can keep the helpful microbes in balance so the dangerous ones don’t take control in this touch-screen video game. As you play, you’ll learn that although antibiotics attack the invading bacteria that make you sick, they can also kill the healthy microbes in your body. Your challenge is to poke the beneficial microbes with your finger to get them to divide, react, and re-populate in a 60-second race against the pathogens. A “health-o-meter” shows how well you are doing keeping the good flora out-competing the unhealthy invaders. Each round of the game will be slightly altered to increase the variety of outcomes so you can play again with a different strategy to better optimize the balance. *Age Range: Grade 4 – Adult; Exhibit Interface: Computer/Audio*



How Should You Wash Your Hands?

How long does it take before your hands are free of germs? Hand washing is an everyday action that affects our personal health. Place your hands under the faucet to turn on the “water” and start the 20-second countdown timer. As you begin your simulated hand washing challenge, watch the large hand above light up with colorful microbes and see how long it takes to kill off the germs. Don’t skimp, there may be a few persistent pathogens that remain until the very end. Twenty seconds can feel like a long time if you aren’t used to proper hand-washing techniques!

Age Range: Kindergarten – Adult; Exhibit Interface: Mechanical/Electronic/Audio

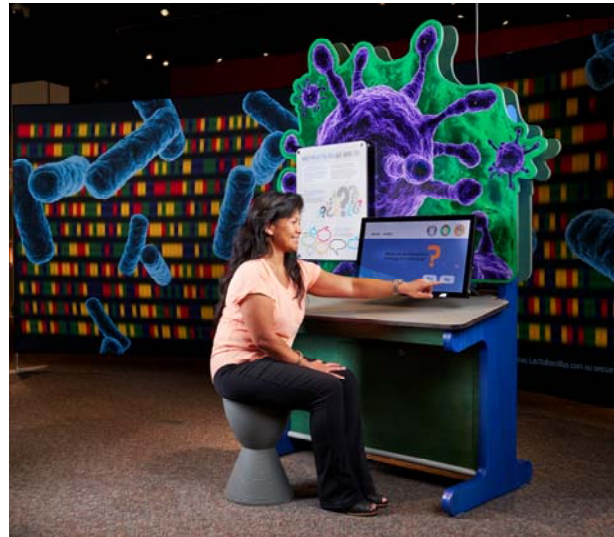
EXPLORING OUR MICROBIOME

What Would You Do?

Would you donate your poop to science? Vote on different scenarios and find out if most people agree or disagree with your choice. Choose one of three stories by tapping the touchscreen and answer a yes-or-no question based on your personal values, attitudes and cultural influences in everyday life situations. Once you've cast your vote, you'll watch a short (45-60 second) but engaging video with playful animation which, along with an expert scientist, helps explain microbiome research on that particular topic in more depth:

- 1). Would you be interested in studying astronaut poop?
- 2). Would you accept someone else's microbes to make yourself healthier?
- 3). Would you be willing to donate your poop for science?

After the video, you'll have a chance to reconsider your decision and vote again. A tally of all the pre-video and post-video votes from the last few weeks will be displayed so you can see general cultural trends. Select another story until you have voted on all three scenarios. Microbes affect our lives in several ways and often there is not one "correct" answer to the many situations and choices we face daily. *Age Range: Grade 4 – Adult; Exhibit Interface: Computer/Video/Audio*



What Do Your Microbes Look Like?

Here's a chance to do "real science" by peering into an authentic microscope to examine and compare genuine preserved specimens in six slides (Candida yeast, Anthrax bacteria, Lactobacillus bacteria, Spiral bacteria, E. coli fecal bacteria, and human blood cells with yeast and bacteria). The attached field guide identifies each slide. Discover how very small microbes are, that many can't be "grown" in a laboratory, and that there are countless undiscovered species still to be found within our own bodies. These organisms are part of our daily lives and some of them may even be living in and on us right now! *Age Range: Kindergarten – Adult; Exhibit Interface: Mechanical/Electronic*

Do All Viruses Make You Sick?

Can you build your own virus? With a gigantic sculptural bacteriophage virus towering in the center of this creative activity, you are challenged to assemble your own smaller virus using various head, body, base, and fiber puzzle pieces. You can either create a virus that matches the giant model, or invent a new mutant configuration of your own. Diagrams explain the parts of the virus and what they do. Viruses can be very complex even though they are tiny and are an important part of the microbiome. In fact, an amazing number of viruses prey on the bacteria in our bodies, which in turn regulates our microbiome. *Age Range: Kindergarten – Adult; Exhibit Interface: Mechanical*





What Is Your DNA Puzzle?

How can we identify organisms that are hidden inside our bodies and often are even too small to see under a microscope? Every living thing has a unique pattern of DNA and we can use DNA computer sequencing to investigate the diversity of life inside us and identify our microbes. Now you can play the role of the sequencing computer—in a much slower, but fun, simulation of what those machines do. In this activity, you'll race against the clock to see how

fast you and your friends can assemble a puzzle of a DNA strand. One of the DNA strands is fixed. Try to reassemble the other half of the sequence by placing puzzle pieces in the correct spaces to fill out the other strand. Work fast, you only have 60 seconds before the game resets itself with a pop! By identifying the life within us through DNA sequencing and studying our microbes, microbiome researchers and scientists hope to solve some of our health mysteries and someday, even our diseases.
Age Range: Kindergarten – Adult; Exhibit Interface: Mechanical

What Would You Look Like As A Microbe?

Take a picture of yourself, your family and friends, all as giant colorful microbes in this fun, full-body photo-op activity. Three large freestanding murals of microbial colonies have cut-out holes at a variety of heights for visitors of all ages and sizes. As you leave the exhibit, your souvenir photos will reinforce the fundamental connection between humans and microbes. *Age Range: Preschool – Adult; Exhibit Interface: Large Graphic Cut-Outs*



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