



**Animal Flash Facts**

# RESEARCH ANIMAL TRADING CARDS



9190 Crestwyn Hills Drive | Memphis, TN 38125  
foundation@aalas.org | kids4reaserach.org



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# FROGS



## helped scientists achieve these **AMAZING** medical discoveries!

- Scientists identified protein-building blocks that increases the release of insulin, which helps people with diabetes.
- Scientists have engineered a clear-skinned version of a frog which allows them to more easily study the progress of cancer and the aging of internal organs.
- The frog heart is a model for describing and understanding the dynamics of heart contraction.

**Fun Facts:** The first frog body was found in 200 million-year-old fossils. There are 70–100 new species of amphibians discovered each year, especially in the tropics. The smallest frog, found in Cuba, is 0.33 inches long. The largest frog, the Goliath Frog of West Africa, is 15.7 inches long and weighs 7.2 pounds. The champion frog jumpers are tree frogs. Some can jump a distance 46 times their body length and a height 62 times their body length. Frogs are one of the few vertebrates that can freeze and survive the frozen state.

# ARMADILLOS



## helped scientists achieve these **AMAZING** medical discoveries!

- The armadillo helped scientists develop a vaccine for leprosy, a disease associated with open sores.
- Armadillos also make good models in scientific, behavioral, and medical studies related to reproductive health. They have an unusual reproductive system, in which four genetically identical quadruplets are born in each litter.

**Fun Facts:** Armadillos are the only mammal, other than humans, that are susceptible to leprosy. Armadillos are almost completely covered by a hard outer shell made of bones. They are only found in warmer climates. They have long, sticky tongues to grasp insects. They eat fire ants! They can hold their breath under water for up to 6 minutes. When armadillos are frightened they curl up into a ball.

# BEES



## helped scientists achieve these **AMAZING** medical discoveries!

- Bees have played a role in studies of social behavior, learning and memory, and immunology (due to the allergens in their venom). In research studies in the laboratory, scientists found that a month of bee venom injections helped suppress symptoms of enlarged prostates in rats. Bee venom reduced inflammation and helped correct the imbalance between prostate cell growth with cell death rates.
- Based on results in the lab, it's possible that down the road, bee venom could become a drug therapy for treating enlarged prostates in men.

**Fun Facts:** Bees are the only insect in the world that make food which people can eat. Honey bees' wings stroke 11,400 times per minute, thus making their distinctive buzz. It takes 550 bees visiting 2.5 million blossoms to make a single pound of honey. To share information about the best food sources, bees perform their "waggle dance." When the worker bee returns to the hive, it moves in a figure-of-eight and waggles its body to indicate the direction of the food source.

# CATS



## helped scientists achieve these **AMAZING** medical discoveries!

- Cats have contributed to the study of emotion, cardiac disease, spinal cord injury, cataract surgery, glaucoma, lupus, diabetes, and more.
- Cats have acute hearing, excellent eyesight, and highly developed balance and spatial awareness. Studies with cats have enhanced our understanding of eye disorders. Cats have contributed to research on glaucoma and cataract surgery.

**Fun Facts:** A cat's nose pad is ridged in a pattern that is unique, just like the fingerprint of a human. A cat almost never meows at another cat. This sound is reserved for humans. Cats see in color and need 1/6th the amount of light that humans do to see in the dark. Cat whiskers (vibrissae) are connected securely to the sensitive muscular and nervous systems, sending information about the surroundings directly to the cat's sensory nerves, giving it a heightened sense of feeling and helping it detect and respond to changes in its surroundings—sort of like kitty radar.

# CHICKENS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Chickens are important models for genetic and developmental studies because they produce hardy embryos that develop outside the body of the mother.
  - The shell of the chicken egg can be cut and covered with clear plastic so that development of the chicken can be viewed at all stages.
  - Chick research also helped researchers discover the molecular basis of limb development—a process similar in humans and birds—and have helped the understanding of many limb disorders.
  - Chickens have a four-chamber heart which makes them good models for heart conditions such as atrial septal defect, often referred to as a hole in the heart.
  - Studies with chickens established the first link between tumors and viruses.
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**Fun Facts:** A hen can lay more than 300 eggs a year. Chickens dream when they sleep. Chickens have more bones in their necks than giraffes.



# CHIMPANZEES



**helped scientists achieve these  
AMAZING medical discoveries!**

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- Chimpanzees are valuable models for understanding malaria and screening antimalarial drugs.
  - Chimpanzees are the only animal, other than humans, that can be infected with HIV. Researchers are trying to understand why HIV-infected chimps do not suffer symptoms of AIDS.
  - Studies with chimpanzees led to the development of a vaccine against hepatitis B virus. Ongoing efforts are trying to develop vaccines for other infectious diseases, such as hepatitis C and respiratory syncytial virus (RSV), a common cause of pneumonia and bronchiolitis in children.
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**Fun Facts:** Chimpanzees don't like to be in water and usually can't swim. Chimps and humans share 98% of their genes. Chimpanzees are one of the few animal species that use tools.

# CHINCHILLAS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Chinchillas provide the only animal model for the common, but painful problem of childhood middle-ear infections.
  - Chinchillas are needed as research models for the study of hearing because they respond to pure tones and they have very similar middle-ear anatomy and nervous system connections as humans.
  - Chinchillas are very important in studying cholera because they mimic the disease in humans so closely. Cholera is a bacterial infection of the small intestine that is primarily spread through consuming contaminated food and water. Despite an oral vaccination that is 85% effective, cholera causes over 100,000 deaths worldwide each year.
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**Fun Facts:** Chinchillas are agile jumpers and can jump up to five feet above their head. They have the highest fur density of any animal with more than 20,000 hairs per square centimeter. They have no dander, which is the leading cause of pet-related allergies. Their fur is considered the softest in the world and is 30 times softer than human hair.

# COWS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Scientists' work with cattle led to a small pox vaccine. Smallpox, an infectious human disease, was believed to have killed more than 300 million people in the 20th century. Thanks to the smallpox vaccine, by 1977 the disease no longer existed.
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**Fun Facts:** Cows are grass grazing animals. They graze for about 8 hours a day. They have a stomach with four compartments to help digest grasses and grains. No two cows have the same pattern or spots. Cows drink about a bathtub full of water and eat around 40 pounds of food a day!

# DOGS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Studies with dogs have allowed scientists to first discover insulin which helped pave the way for insulin replacement—a treatment used by over 24 million individuals in the U.S. today who have diabetes.
  - Research with dogs in the 1950s helped in the creation and refinement of the first heart-lung machine, which, in turn, led to the first open heart surgery.
  - The dog played an essential role in the creation of cardiac pacemakers, heart transplant surgery, and the canine distemper vaccine, helping save the lives of millions of humans and animals.
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**Fun Facts:** Dogs cool themselves by panting. Dogs are close relatives of the wolf. Dogs have been man's pet for more than 14,000 years and are often referred to as man's best friend. A dog's sense of smell is 10,000–100,000 times more acute than that of humans.

# FERRETS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Influenza infection in ferrets closely resembles infection in humans with regard to symptoms.
  - Ferrets are needed to study age-related susceptibility to the flu and have played an important role in understanding why flu viruses resist antiviral drugs.
  - Ferrets are studied to identify new seasonal strains of flu and help researchers measure the effectiveness of flu vaccines.
  - Ferrets are used to study all aspects of canine distemper, a serious and fatal disease of dogs and many forms of wildlife.
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**Fun Facts:** Ferrets have been domesticated for thousands of years. There are pictures of ferret-like creatures on leashes on the walls of some Egyptian tombs. A newborn ferret is so small that it can fit into a teaspoon. Ferrets can sleep so soundly that they cannot be woken up even when picked up and jostled. The Latin name for ferret, *Mustela putorius furo* means “smelly little thief.” A group of ferrets is called a “business.”

# FRUIT FLIES



## helped scientists achieve these **AMAZING** medical discoveries!

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- The genes of fruit flies are much like the genes in humans. Scientists are using this similarity to help understand learning and memory-related diseases such as Alzheimer's, Parkinson's, and autism.
  - Scientists working with fruit flies have identified genes responsible for the development of tumors that grow in the brain, lung, kidney, skin, and other organs. With clinical trials now underway, this insect could help doctors treat cancer-related diseases.
  - Fruit flies have helped researchers understand aspects of human metabolism, including why pregnant women suffer from bloating and constipation, and even the link between a low-calorie diet and longer life spans.
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**Fun Facts:** Most of these insects have red eyes and are about 1/8" in length. Fruit flies are only 3 millimeters long and live only 60-80 days. Fruit flies have many things in common with humans. They share many human disease genes, cellular processes, brain cell development, and behaviors. Fruit flies got their name because they are known to linger around overripe or rotting fruit.

# GIANT SQUID



## helped scientists achieve these **AMAZING** medical discoveries!

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- Research with squids has contributed to our understanding of the nervous system.
  - Studying the nerve axon of the giant squid provided the foundation for the understanding of how messages are transmitted in human brains, particularly the many roles played by ion channels in regulating activities in living cells.
  - Squid were first studied in the 1930s to examine the properties of nerve cells. Scientists found the nervous system behaves like a series of microscopic generators, with electrical pulses repeatedly created and fired along nerve cells in response to a stimulus, such as touch or heat.
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**Fun Facts:** Squid have excellent vision, which they rely on to catch their prey. The retina of the squid shares many common features with that found in the eyes of humans and other mammals. Giant squid have eyes the size of basketballs. Squid have three hearts. Some squid have bioluminescent organs that make them glow in the dark. The giant squid is massive and when full grown can be at least 33 feet (10 meters) long.

# GUINEA PIGS



## helped scientists achieve these **AMAZING** medical discoveries!

- Guinea pigs played a crucial role in the development of inhaled asthma medication.
- Stepping on a rusty nail used to be deadly because of the tetanus virus. Thanks to research with guinea pigs (and horses), a tetanus vaccine was developed.
- Over a 100 years ago, tuberculosis was one of the most common causes of death. Research with guinea pigs led to the first antibiotics effective against tuberculosis.

**Fun Facts:** Research with guinea pigs has led to over 23 Nobel Prizes in medicine. Guinea pigs are about the same size as a rat. Unlike many other rodents, guinea pigs have no visible tail. The offspring of guinea pigs are called pups and they are born with fur and their eyes are open. The guinea pig is not at all related to the pig. Guinea pigs got their name because they emit a sound that sounds like a pig. Guinea pigs' teeth are constantly growing. Chewing helps wear their teeth down.



# HAMSTERS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Chinese hamsters develop an inherited form of diabetes mellitus—similar to insulin-dependent diabetes in humans—which makes them excellent research models to help investigate treatments for diabetes.
  - An experimental hamster vaccine for Lyme disease has been produced which will hopefully lead to vaccines suitable for livestock, pets, and eventually, humans. A vaccine that protects dogs from Lyme disease is in general use.
  - Hamsters are needed for testing the effectiveness of various antibiotics in treating Lyme disease, as well as in developing diagnostic tests.
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**Fun Facts:** Like other rodents, a hamster's teeth grow continuously throughout their lifetime. In the wild, hamsters dig extensive tunnels beneath the ground, extending as far as 3 feet in depth. Hamsters will line their tunnels with grass, wool, or hair shed from other animals to help maintain a fairly constant temperature in their burrow, no matter the outside temperature.

# HORSES



## helped scientists achieve these **AMAZING** medical discoveries!

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- Scientists are working with horses to test new methods of tissue regeneration that uses concentrated stem cells.
  - Horses helped cure diphtheria and toxic bacillary dysentery by producing antisera to the toxins of these bacteria.
  - Horse studies are underway to find a cure for equine herpes virus. Heart catheterization was developed first in 1861 in horses.
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**Fun Facts:** Horses can't breathe through their mouth. Horses can't vomit. Horses have seven common blood types.

# HORSESHOE CRABS



## helped scientists achieve these **AMAZING** medical discoveries!

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- The blue blood of horseshoe crabs is the most effective way to test for bacteria. By taking their blood and then releasing them back into the ocean, scientists are able to test the safety of intravenous drugs, vaccines, and medical devices.
  - The flexible glue that holds together the shell of this animal has many wound-healing properties. Scientists use the glue to create absorbable stitches and dressings for burns and surface wounds.
  - This animal has 9 eyes—2 of which have some of the largest eye parts of any animal on the planet. This feature makes it an excellent model for research that has led to advances in our understanding of human vision.
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**Fun Facts:** The horseshoe crab is harmless despite its threatening appearance. Its spike-like tail is not poisonous and its claws are not sharp. The horseshoe crab does not have the same type of blood as mammals; its blood is called hemolymph and it is blue in color.

# MONKEYS



**helped scientists achieve these  
AMAZING medical discoveries!**

- Cotton-top tamarins have been used in research as models for chronic colitis, which is linked to an increased risk of colon cancer.

**Fun Facts:** There are over 81 species of New World monkeys in the Amazon basin alone. Monkeys peel the skin of bananas just like us! The call of the howler monkey can be heard for up to 100 miles.

# MICE



## helped scientists achieve these **AMAZING** medical discoveries!

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- Rabies is a disease that causes the brain to swell and affects all mammals; however, thanks to research with mice, a rabies vaccine for our pets, as well as treatment for humans, is now available.
  - Research with mice led to the development of penicillin, an antibiotic used to treat infections. Today penicillin is the most widely used antibiotic saving thousands of lives every day.
  - Mice played an essential role in the development of chemotherapy treatments for leukemia, the most common cancer affecting children. Thanks to this research, and other advances, the survival rate for leukemia patients has skyrocketed from 30% to 80% today.
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**Fun Facts:** Mice are most active at night and chew through anything that is softer than their teeth. The tails of mice are as long as their bodies. A mouse was the inspiration behind the first and most famous Disney character of all time, Mickey!

# OPOSSUMS



## helped scientists achieve these **AMAZING** medical discoveries!

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- The gray short-tailed opossum is the only mammal known to develop melanoma skin cancer solely in response to ultra-violet light, which makes it a good model for studying human skin cancers.
  - Baby marsupials have the ability to regenerate a crushed or severed spinal cord until they are around 10 days old. Studying the cellular mechanisms that enable this to occur will help scientists improve understanding of nervous system development and may help find new therapies for spinal cord injuries.
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**Fun Facts:** Opossums are quite often referred to as the “living fossil” as they have been residing on earth since the dinosaur age. They have been known to inhabit the earth for the past 70–80 million years, making them one of the world’s oldest surviving mammals. A female opossum gives birth to helpless young as tiny as honeybees. Babies immediately crawl into the mother’s pouch where they continue to develop. When threatened by predators, opossums sometimes flop onto their sides, lie on the ground, and pretend to be dead.

# PIGS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Heart valves from pigs have been used to replace damaged heart valves in humans. The physical structure of pigs' organs is very similar to humans, which makes them excellent research models.
  - CT or CAT scans (a special X-ray that helps doctors look inside the body without surgery) were developed using pigs. CT or CAT scans have helped doctors identify broken bones, cancers, blood clots, signs of heart disease, and internal bleeding.
  - Pigs helped develop skin grafts for burn victims. In severe cases, the skin of pigs may be used as a temporary cover for open wounds until a more permanent solution can be found.
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**Fun Facts:** Pigs have no sweat glands. They roll in the mud to cool their skin but actually prefer not to sit in mud. In fact, they prefer cleanliness much more than other animals. Many experts consider pigs to be more trainable than dogs or cats.

# QUAIL



## helped scientists achieve these **AMAZING** medical discoveries!

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- Quail play a critical role in research into head and facial development.
  - Quail eat many kinds of seeds and are used in palatability studies, which show the likelihood of a new pesticide being eaten by birds.
  - Quail also eat a variety of worms and insect larvae and may be used to study the potential effects of a chemical substance on the food chain.
  - Quail are important models for reproductive studies that look at the effects of chemicals on the environment.
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**Fun Facts:** Many species of quail are well developed from the moment of hatching and can leave the nest with their parents. The Bobwhite quail, an important species for biomedical research, gets its name from its distinctive call.



# RABBITS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Cystic fibrosis is an ailment that affects the lungs and digestive tracts of children and adults. Researchers are working with rabbits to see if gene replacement therapy could prevent the disease and become a treatment for patients.
  - Have you ever had stitches or a cavity filled? If so, you have the rabbit to thank for helping scientists develop local anesthesia, which is the numbing agent that helps make those type procedures much less painful.
  - The young of rabbits were the first to be successfully treated with a substance to help lungs more easily inflate and deflate. Today, nearly 90% of premature babies born with lung distress issues survive thanks to scientists' work with rabbits.
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**Fun Facts:** Rabbits have long, sensitive ears that can be turned in any direction. Rabbits are known for hopping and can jump 3 feet or higher. Contrary to popular belief, rabbits are not rodents, but, belong to a separate group of animals called lagomorphs.

# RATS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Studies with rats have helped researchers understand and develop new drugs to prevent or delay the onset of Alzheimer's disease.
  - Rats were among the first animals to be studied by researchers investigating how learning takes place in the brain and how memories are formed.
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**Fun Facts:** Rats are the second most commonly studied mammal in research. Rats are pretty great swimmers, and most of them really enjoy it! Giant African rats are trained to detect deadly landmines. They're larger than pet rats, but small enough that they don't set off the landmines while searching for them.

# SCORPIONS



## helped scientists achieve these **AMAZING** medical discoveries!

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- A compound found in scorpions is currently being studied by scientists for its ability to reduce the spread of cancerous cells. By itself, the scorpion's venom could kill humans, but, thanks to animal research, this sting could be life-saving.
  - Venom from scorpions is known to interact with channels that communicate pain to our brain. By studying the scorpion's toxins, scientists hope to engineer a new painkiller that would have no side effects.
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**Fun Facts:** These animals are florescent under ultraviolet light. This arthropod's sting does not come from its claws or fangs, but from its tail.

# SHARKS



## helped scientists achieve these **AMAZING** medical discoveries!

- Squalamine, found in the liver of sharks, acts as an antiviral agent against some forms of hepatitis that cannot currently be treated.
- Extract made from the cartilage of this predator has been found to shrink cancerous tumors in animal models.

**Fun Facts:** Sharks can detect blood at one part per million, which allows them to determine the direction of the scent based on the time it takes to reach one nostril compared to the other. Sharks can pick up the small electromagnetic fields emitted by their prey using receptors on their snout. Sharks do not have any bones in their body—they only have cartilage.

# SHEEP



## helped scientists achieve these **AMAZING** medical discoveries!

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- Along with goats and dogs, sheep have helped scientists develop and perfect hip replacement surgery—a procedure that is conducted on approximately 200,000–300,000 patients each year.
  - Studies of sheep helped researchers understand the hormonal changes that occur in mother and fetus shortly before birth, as well as develop new treatments for respiratory distress in premature infants.
  - The materials used to construct the first successful shunt, which allow kidney failure patients to be connected to dialysis machines for longterm treatment, were perfected through research with sheep.
  - Sheep were essential to research which led to a vaccine for anthrax, an infectious and deadly disease of farm animals that can be transmitted to people.
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**Fun Facts:** Sheep hang out in flocks. Baby sheep are called lambs. Sheep's hair is called wool. Sheep were domesticated 10,000 years ago in Central Asia. One pound of wool can make 10 miles of yarn.

# WOODCHUCKS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Captive and lab-reared woodchucks develop many of the nutritional and medical problems of humans, such as obesity and cardiovascular disease. For this reason, they are used to study the metabolic changes caused by these diseases.
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**Fun Facts:** A woodchuck would chuck no amount of wood since a woodchuck can't chuck wood! Woodchucks are among the few animals that are true hibernators, fattening up in the warm seasons and snoozing for most of 3 months during the chill times. The heart rate of a hibernating woodchuck slows from about 80 beats per minute to 5 and breathing slows from around 16 breaths per minute to as few as 2.

# WORMS



## helped scientists achieve these **AMAZING** medical discoveries!

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- Nematode worms are studied extensively in biological research; the most common being the tiny roundworm *Caenorhabditis elegans*.
  - Worms are susceptible to environmental changes and mutations, and the effects of these can be seen on later generations within a short experimental timeframe.
  - Researchers work with worms to help identify dozens of new antibiotics.
  - A research team discovered how *C. elegans* “smell” food, triggering receptors, which in turn activate particular nerve pathways and lead to certain types of movement, enabling the worm to reach its food source.
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**Fun Facts:** *C. elegans* (roundworms) are found in the soil, are approximately 1.0 mm long, develop from a larva to adult in 3 days, and have an average life span of just 2 weeks. Many generations are born within a time frame of days.

# ZEBRAFISH



## helped scientists achieve these **AMAZING** medical discoveries!

- The transparent embryos (eggs) of zebrafish give scientists a clear window to study genetically related diseases and the effects medical treatments have on development.
- Using genetic techniques, a team of researchers stimulated the development of T cell acute lymphoblastic leukemia in zebrafish, enabling researchers to screen thousands of zebrafish genes for mutations that contribute to the disease, and to test the effect of various anticancer drugs.

**Fun Facts:** Zebrafish are 1–2 inch long aquarium fish found in the rivers of India. Zebrafish grow to adulthood and are able to breed within 2 to 3 months. They produce large numbers of young; female zebrafish can lay 200-400 eggs a week. Zebrafish embryos are transparent and develop outside the mother's body which enables researchers to visualize developmental processes easily without invasive procedures.