

Model Organism Match-Up Game

Draw a line, matching each organism to what scientists at the Morgridge Institute learn from it.

<u>Organism</u>	<u>What Scientists Study</u>
Fruit fly (<i>Drosophila melanogaster</i>)	Regeneration and stem cells
Zebrafish (<i>Danio rerio</i>)	Heritable human disease
Flatworm (<i>S. mediterranea</i>)	Genetics and developmental biology
Mouse (<i>Mus musculus</i>)	Organ development and neurological disorders

Compare Humans with Model Organisms

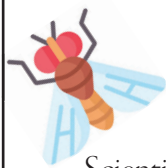
Fill in the box with a checkmark if the organism has the feature.

<u>Feature</u>	<u>Human</u>	<u>Fruit fly</u>	<u>Zebrafish</u>	<u>Flatworm</u>	<u>Mouse</u>
Fully sequenced genome	☐	☐	☐	☐	☐
Short life cycle (less than 2 weeks)	☐	☐	☐	☐	☐
Has a spine	☐	☐	☐	☐	☐
Moves by gliding on a trail of mucus	☐	☐	☐	☐	☐
The most similar to humans	☐	☐	☐	☐	☐
Cheap and easy to maintain in the lab	☐	☐	☐	☐	☐
Can reproduce by laying egg capsules or by tearing itself into two pieces that go on to produce two complete and identical organisms.	☐	☐	☐	☐	☐

Answer key: Model Organism Match-Up Game: Fruit fly --> Genes and developmental biology, Zebrafish --> Organ development and neurological disorders, Flatworm --> Regeneration and stem cells, Mouse --> Heritable human disease. Compare Humans with Model Organisms: Human - Fully sequenced genome, has a spine. Fruit fly - Fully sequenced genome, short life cycle, cheap and easy to maintain in the lab. Zebrafish - Has a spine, cheap and easy to maintain in the lab. Flatworm - moves by gliding on a trail of mucus, cheap and easy to maintain in the lab, can reproduce by laying egg capsules or by tearing itself into two pieces that go on to produce two complete and identical organisms. Mouse - has a spine, the most similar to humans.

Model Organisms at Morgridge

A model organism is a living thing that scientists study to learn about biology. Many model organisms share important features with humans, helping scientists to understand how our bodies work. At the Morgridge Institute for Research, some commonly used model organisms include the fruit fly, zebrafish, flatworms and mice.



Fruit Fly (*D. melanogaster*)

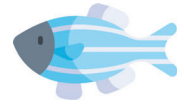
Scientists have studied fruit flies for over 100 years.

Life cycle is only 10 days!

Powerful model for studying genetics and developmental biology.

At Morgridge, fruit flies are studied to understand how things like diet and stress affect the behavior of stem cells.

Zebrafish (*Danio rerio*)



Transparent embryos allow scientists to watch organ development in real-time.

Do not have lungs or mammary glands.

Excellent for studying organ development, neurological disorders, and metabolic diseases.

At Morgridge, zebrafish are studied to learn how the poor regeneration capacity of human tissues can be improved.



Flatworm (*S. mediterranea*)

Ideal model organism for studying regeneration.

The outer layer of skin that covers the flatworm underside, is lined with cilia. This allows them to glide over surfaces.

At Morgridge, flatworms are used to study how somatic stem cells differentiate, and how the newly differentiated cells work together with existing tissues and organs.

Mouse (*Mus musculus*)



Over 80% genetic similarity to humans.

Expensive and time-intensive to house and breed in the lab.

Like humans, mice can spontaneously develop mutations, making them valuable models of heritable human disease.

At Morgridge, mice are used as preclinical animal models to investigate virus-induced cervical cancer.