

# Introduction to Biology. Lecture 22

Alexey Shipunov

Minot State University

March 22, 2017



- 1 Where we are?
  - Basic principles of animal body construction
- 2 Animal
  - Animal body



- 1 Where we are?
  - Basic principles of animal body construction
- 2 Animal
  - Animal body



# Where we are?

## Basic principles of animal body construction



# Animal motion

*Peristaltic: earthworm*

*Bending: nematode*

*Swimming upside down: horseshoe crab*

*Swimming: horseshoe crab*

*Walking: crab*

*Swimming: ray*

*Water-vascular: starfish*

*Jet: jellyfish*

*Jet: squid*



# Animal

## Animal body



# Skin

- One- or multi-layered epithelium
- Basal membrane with collagen
- Skin-muscular bag



# Muscle system

- Muscle layer
- Separate muscles
- Water-vascular system





# Body cavity

- Mesoderm, no cavity
- Primary cavity
- Secondary cavity (coelom)



# Digestion

- Closed or open gut
- Pharynx
- Jaws and teeth
- Stomach, esophagus etc.
- Digestion glands: liver etc.



# Blood system

- Open and closed
- Heart
- Hemoglobin and hemocyanin



# Respiration

- Gills
- Lungs
- Tracheas



# Osmoregulation

- Nephridia
- Kidneys



# Nervous system

- Diffuse neurons
- Trunks and circles
- Ganglia
- Brain



# Reproduction and development

- External and internal fertilization
- Direct development or development with metamorphosis



# Summary

- Basic organ systems of animals are responsible for
  - locomotion and support;
  - feeding, excretion and osmoregulation;
  - circulation and gas exchange;
  - signaling and reception;
  - reproduction.





# For Further Reading



**Animal.**

<http://en.wikipedia.org/wiki/Animal>

