STUDY GUIDE FOR EXAM 2

Be able to explain the key concepts at the end of the chapters, as well as answer the test our knowledge questions. Know the information described below, and the terminology associated with each of these learning objectives.

Use of the term “understand” means to understand and be able to explain the structure, process, etc.

1. Know the general characteristics associated with Kingdom Animalia. This includes cellular traits; evolutionary patterns; type(s) of locomotion, reproduction, symmetry, directional terms appropriate for each type of symmetry.
2. Understand the increasing levels of complexity and the different body plans shown in the different animal phyla. Understand the cellular, tissue and organ system levels of organization, and know what phyla fit into each of these levels.
3. Know what Parazoa and Eumetazoa are, and understand their basic characteristics.
4. Understand basic embryology of animals. Know the germ layers found in embryological development, and what organ systems develop from each layer. Know what the terms diploblastic and triploblastic mean. Understand the differences in tissues and organs that can develop from each type of embryo. Know which phyla have each type of embryo.
5. Understand radial and bilateral symmetry, and know which type of symmetry is found in each phylum.
6. Know what the terms “acoelomate,” “pseudocoelomate” and “coelomate” mean. Know what a schizocoelom and an enterocoelom are. Understand the embryological development of all of these, and the role of the germ layers in each situation.
7. Know what protostomes and deuterostomes are, and be able to explain their embryological development. Know which phyla fall into each category.
8. Know the various stages of embryological development and what is occurring in each stage. Understand spiral vs radial cleavage, and determinate vs indeterminate cleavage. Know which are found in protostomes and which in deuterostomes. Understand the embryological development and the advantages of segmentation.
9. Know the characteristics for each phylum and class (if studied) within the phylum. For example, for each of the phyla studied, know and be able to explain: habitat; lifestyle; symmetry; level of organization (cellular, tissue, organ system); body plan; body regions; anatomy; types of cells, tissues, organs, organ systems, (including those that are lacking in each phylum); type of skeleton; type(s) of reproduction; special adaptations for their lifestyle; life cycles. Know the anatomical terms for structures assigned to be learned in lab and used in your atlas.
10. If a phylum has both aquatic and terrestrial members, know the differences between them, and the correct terms for the anatomical structures adapted for each environment.
11. Know the scientific names of those organisms for which names were provided in lab or lecture.
12. Know the classification as studied for each phylum, and be able to give examples of organisms found in the phylum and in each of the lower taxonomic levels studied.

13. Know the significance of the trochophore larva and what phyla have it.

14. Understand the general patterns of increasing complexity as you move through the animal phyla studied. This would include type(s) of: body plans, body cavities, skeleton, feeding methods, cephalization (or lack thereof), sensory structures, organ systems, and other adaptations. Know how each works and the advantages of each type.

15. Know the various life cycles and adaptations for parasitism found within the phyla and classes. Understand what a definitive host and an intermediate host is, and know what organisms are definitive or intermediate hosts within the life cycles of the parasites studied.

16. Know diseases (we discussed) caused by members of each phylum/class, what happens in the disease and the symptoms of the disease. Know what specific organisms cause these diseases.

17. Understand what tagmosis is, what phyla have it, and what it looks like in each phylum.

18. Know the basic chordate characteristics and which phyla have all of them, or some of them.

19. Understand the adaptations necessary for vertebrates to be fully adapted to land. Know which groups have some or all of these characteristics, and what their habitats and lifestyles are.

20. Understand what homeotic genes are (for example, Hox gene complex), and what role they play in the diversity of vertebrate traits.

21. Understand the phylogeny of the vertebrates (but don’t worry about being able to explain the entire evolutionary history as currently understood). Understand the advances within each class.

22. Understand the general characteristics of extant members of subphylum vertebrata.

23. Understand the characteristics of each class within subphylum vertebrata.

24. Know the terms “oviparous,” “ovoviviparous” and “viviparous.” Know which vertebrate groups utilize each type of development.

25. Understand ectothermy and endothermy, the significance of each to the lifestyles of vertebrates, and anatomical adaptations associated with each of these metabolic traits. Know which vertebrate classes fall into which category.

26. Know the different types of animal tissues, the function of each, and where each type is found in the animal body. Know the differences between tissues and organs.

27. Know the organ systems of animals and the basic function of each.

28. Understand the structure and function of cell junctions.

29. Understand what homeostasis is, its significance, and how animals accomplish it. Know what the extracellular fluid is, how it relates to the blood, and their role in homeostasis. Understand both local and systemic control systems. Understand negative feedback control systems.

30. Understand the purpose and function of the digestive system. Know what “digestion” means. Understand the difference between extracellular digestion and intracellular digestion. Know the names and functions of the various organs found in the digestive systems of invertebrates and vertebrates. Be able to explain the role of surface area in digestion, and what organs show specific adaptations for lots of surface area.

31. Understand the digestive system of mammals (humans) in detail. Know the names and functions of the various organs. Know the names and functions of the enzymes and hormones released during the digestive process. Know which organ produces each enzyme or hormone, and where in the digestive system these molecules actually function.
Know where in the digestive system the various components of food are broken down and where they are absorbed. Understand where ulcers occur and why.

32. Be able to explain in essay format exactly how a complete meal is broken down in the digestive system—proteins, carbohydrates, and fats. Where are each of these molecules broken down, what hormones/enzymes are involved, what the breakdown products are and where the products are absorbed.

33. Know the various groups of biomolecules provided in a balanced diet (carbohydrates, proteins, fats), what the subunits of these molecules are and how the body uses each of these groups of molecules. Know that both energy and nutrients are provided by these molecules. Know what a vitamin is, how fat-soluble and water-soluble vitamins are used by the body, and why fat-soluble vitamins can be toxic in high doses. Know the diseases associated with a lack of vitamins A, C, D and K. Know what essential amino acids and fatty acids are. Understand protein complimentarity.

34. Understand open and closed circulatory systems. Know which phyla have each type, as well as which phyla have no circulatory system and why they don’t need a circulatory system. Know what hemolymph is in those phyla with open circulatory systems.

35. Understand the vertebrate circulatory system with emphasis on the mammalian (human) system, including purpose and function of the various organs and structures. Understand and be able to explain the various components of the blood, and the function of plasma, red blood cells, white blood cells and platelets. Know the structure and function of arteries, capillaries and veins. Know the structure and function of the heart. Be able to name the various chambers, valves, vessels, etc. Be able to explain what makes the heart contract, and the role played by the heart valves in the process. Know the position and function of the SA and AV nodes.

36. Be able to explain the pathway of blood as it flows into the mammalian heart, goes to the lungs, returns to the heart and then goes out to the tissues of the body. Be able to name the structures/organs through which the blood flows, including heart chambers, valves and vessels. Be sure you can explain if these structures are on the right or left side of the heart.

37. Understand and be able to explain the mammalian lymphatic system, including purpose, function and all the organs involved in the system. Know what lymphatic vessels (lymphatic capillaries) and nodes are. Understand and be able to explain with what other organ systems the lymphatic system is closely involved.

38. Be able to identify everything you looked at in lab, using scientific names if they were given to you. Understand all the questions asked in the lab manual, and know all the terms listed in the lab manual, as well as those given to you by Professor Garrison or the TAs.