

What should you know (like the back of your hand!) when you leave anatomy and before you come to physiology:

Cellular processes

- general understanding of gene units and gene expression (transcription and translation)
- genome
- determination vs. differentiation
- protein synthesis
- cell division (mitosis, meiosis)
- Biochem, 4 Basic metabolites: carbohydrates, proteins, lipids, and nucleic acids. What are the polymers? What are the monomers? Can you identify them by sight? Can you give descriptions of them? What are the polymers used for?

Developmental bio:

- derivation of layers during embryonic/fetal stages: endo, meso, ectoderm

Tissues and tissue structure

Glands: know endocrine vs. exocrine

- "two part" glands
- adrenal, pituitary, pancreas, gonads

Bone growth

- epiphyseal plate closure
- medullary erythrocyte formation

Muscle contraction

- CD ROM Interactive Physiology

Nervous system

- Organization
- Cranial nerves
 - esp. 9,10 to/from chemoreceptors, baroreceptors (the vagus nerve- easily found in the carotid sheath in the neck, running along side the common carotid artery).
- Spinal nerve segmentation; afferent vs. efferent fibers; plexi and their purpose
- Nerve reflex arcs (somatic and autonomic)
- Basic ions (cations and anions) and where they are found : Na^+ , Cl^- , K^+ , and Ca^{+2}
- Autonomic NS
 - Organization
 - Sympathetic and parasympathetic
 - Pre and postganglionic cells, location of ganglia; neurotransmitters at ganglion and effector organ
 - Functions

Cardiovascular

- Blood formation
- Elements and function
- Heart anatomy
 - Blood flow
 - Conductive system
 - Septa, Vessels and valves
 - Coronary circulation (also, what are the first arterial branches off the aorta?)
 - Blood vessel structure
 - Fetal circulation and changes at birth

Lymphatic circulation

- Circuitry (esp. cisterna chyli and thoracic duct)
- Immunity role: organs

Respiratory

- Alveolar / capillary surface
- Blood to / from heart
- Separate blood supply (bronchial arteries and veins)

Digestive

- Stomach
 - Parietal (intrinsic factor, HCl)
 - Chief cells (pepsinogen)
- Liver
 - Portal circulation: Enterohepatic circulation - flow from gut to liver
 - Bile, outflow to GI tract
- Pancreatic endocrine, exocrine (acinar)
- 4 Basic metabolites: COH's, proteins, lipids, and nucleic acids. What are the polymers? What are the monomers? Can you identify them by sight? Can they give descriptions of them?

Renal

- Cortical vs. juxtamedullary nephrons
- Peritubular capillaries
 - Vasa recta
- Juxtaglomerular apparatus
 - Macula densa and juxtaglomerular cells

Endocrine

- Adeno/Neurohypophysis

What should you know (like the back of your hand!) when you leave chemistry and before you come to physiology:

Atoms, molecules

Ions and valence

Ionic and covalent bonds; polar and nonpolar bonds

Polar and nonpolar molecules

Electronegativity

Hydrogen bonding

Dehydration synthesis and hydrolysis

Monomers, Polymerization

Enzymes, active site, allosterism, competitive inhibition

Coenzymes, Cofactors

Law of mass action

Reading reversible chemical equations, shift to left or rt

Structure of biochemical macromolecules (carb, fat, protein, nucleic acids) and their building blocks. ex.

Know the general structure of aa, be familiar with all 20 amino acids

Triglyceride structure and parts

Gene expression (transcription, translation processes) and effects of gene mutation on expression

Protein denaturation

Metabolism: be fairly familiar with glycolysis and Krebs' cycle, ETS, and familiar with Beta oxidation of fatty acids

Oxidation, reduction

Properties of Acids, bases

PKa

Henderson Hasselbach Equation and its use

Titration

Gas Laws, Equation of State, and their application (partial pressures)

Henry's Law

Basic Math Skills that you should understand BEFORE entering physiology:

Associative, commutative, and distributive properties of math (helpful web-site if you need review: <http://mathforum.org/dr.math/faq/faq.property.glossary.html#commutative>)

Percentages and fractions

Rearranging equations to solve for a variable

Basic operation of a scientific calculator

Log and inverse log