

Bio 116: Exam II - Review

Day: Friday, 11/10/17

Time: 2:30 PM to 4:30 PM

Place: Tillet Hall - Room 226 (subject to change, will def be somewhere in Tillet)

Format:

- This will NOT be a lecture-style review of content...if you have any questions about content, add them to this doc and I'll answer them in [blue](#).
- Instead, this will be a comprehensive review consisting of PRACTICE PROBLEMS from Exam II lecture material (lectures 10-17). Therefore, it is critical that you come ALREADY prepared with adequate content knowledge that so that you can APPLY this knowledge to answering exam-like questions!

Bio 116: Exam II - Q&A

- [Add questions below...](#)
- In oogenesis, when exactly does the ploidy change from diploid to haploid?
 - [At the conclusion of meiosis I.](#)
- Can you explain the relationship between the JH hormone and what happens when the levels are high and low. Also what happens to the ecdysteroid
 - [Watch my video on this \[here\]\(#\) and lmk what you're specifically confused about afterwards.](#)
- Hi! Please tell me you're having a review session for 116! We need you! If not friday, could you do it saturday??
 - [Unfortunately I cannot :\(](#)
- What!!!! 115 already had one review session
- omg ali we need you we need help how come 115 gets two review sessions and we don't even get one :(
- This is true! The average was a 63 on exam 1 so not that great either! Please consider Ali
- [Alright, I'll try my best to do something. It would be on the same day as the 115 review \(Friday, 11/10\), probably sometime before it \(before 5 PM\). No promises, but stay tuned.](#)
- Thank you Ali I love you! <3
- Thank you Ali for doing this!!! See you Nov 10th!
 - [You ask and you shall receive!](#)
- YESS IM SO HAPPY THANK YOU ALI
 - [I gotchu](#)
- Question: so in the cleavage patterns 2 video (of development 1 lectures) you wrote that the 4 blastomeres that result from frog cleavage are equal in size. Isn't frog cleave "unequal holoblastic"?
 - [Maybe I should've said "relatively equal in size." A frog is pretty much holoblastic, just not as holoblastic as other groups of animals. We can say they undergo "unequal" holoblastic cleavage. This is where the gray crescent comes into play, but you don't need to know about that.](#)

Thank you for responding!!!

- Does the gray crescent only occur in frogs?
 - I don't think the gray crescent is covered in lecture anymore.
 - Oh really? Because she still mentioned it in lecture but didn't go too much in detail.
- Does karyogamy only happen in mammalian fertilization and not sea urchin fertilization?
 - Both. It happens in all animal fertilization. Karyogamy is what restores diploidy in diploid organisms.
- What is the final result of sea urchin fertilization? I know in mammals it is the zygote
 - Same thing. Any time sperm and egg meet, it results in fertilization, which results in a zygote (fertilized egg).
- So what would you say the order is with development in frogs sea urchins and humans as a whole? Fert- cleav- gastrulation- organogenesis? Did i leave anything out? (not sure if this question makes sense just let me know) Im figuring she's going to ask us a sequence question
 - This looks good!
- Is coping with extreme conditions an example of negative or positive feedback?
 - It depends on *how* the organism is coping or *what* the specific coping mechanism in question is.
- At high thyroid levels, what would the hypothalamus and the anterior pituitary secrete?
 - What do you mean by "high thyroid levels?" The thyroid is a gland...are you referring to thyroid-based *hormones* like T₃/T₄ or are you referring to TSH?
 - TSH!
 - If there's high TSH, the hypothalamus will stop releasing TRH, which then inhibits the AP from releasing TSH, which then lowers the overall TSH levels. This is a classic example of a negative feedback loop.
- When does the primary oocyte leave the ovary?
 - The primary oocyte doesn't leave the ovary. Only when it has developed to a secondary oocyte (arrested at metaphase II) does it leave the ovary via ovulation.
- Do Collenchyma cells have secondary cell walls (Plant Anatomy)
 - Nah. They provide *flexible* support e.g. leaf stalks or non-woody stems and support for young growing organs (think celery strings). Idt Iyou'd need to know this level of detail for the exam.
- What does Ethylene have to do with ripening fruit?
 - I talk about this [here](#).
- Should we know the sequence of the acid growth hypothesis cause we didn't go much in depth during lecture.
 - You're only responsible for what's discussed in lecture.
- Why can lipid soluble hormones pass through plasma membrane but water soluble hormones can't?
 - Because the cell membrane is a lipid bilayer, primarily made of phospholipids. Lipid-soluble hormones are hydrophobic that can dissolve through the (primarily) hydrophobic lipid bilayer. Water-soluble hormones cannot do this.
- Is this correct? Fastest to slowest signaling: Neuroendocrine- synaptic signaling - para and autocrine - endocrine? Would that be correct since nerve signaling is quicker? Would the local signaling be quicker than nerves?

- You wouldn't be asked to differentiate between ALL of them because some the differences are dependent on other factors like what type of signal molecule, how much release, how often released, etc. However, I believe that you should definitely know a nervous signal is the fastest (it's a DIRECT connection between message origin and destination) while hormones through the bloodstream are the slowest. The others fit somewhere in between.

Ohhh okay thank you so much! Np!

- Can the translocation of sugar in a plant go from source to sink and vice versa or is it just one way?
 - It's always source to sink in Gen Bio!
- What's the difference between trichomes and guard cells?
 - I'dt you need to know this level of detail for the exam.
- Is the neuroendocrine pathway a positive feedback example?
 - It depends on the signaling molecule in question and it's function.
- If we just look over our notes and the figures and your lecture videos for clarification, is that enough for the exam?
 - This is a VERY case-by-case scenario and greatly varies from person-to-person, so I really can't tell you for sure.
- Do any invertebrate hormones involve the hypothalamus?
 - Most invertebrates don't have a fancy enough brain to even have a hypothalamus, so I wouldn't worry about it.
- When Cytokinins are without Auxin, why do the cells grow but don't divide? Shouldn't it be the opposite?
 - What I have is that cells *with* auxin but *without* cytokinin grow large (due to the auxin), but don't divide (due to the lack of cytokinin).
- Conformers allow the external env to govern/ determine their internal environments... so why is that homeostasis?
 - You can't look at an organism exclusively as a conformer or regulator. It's always a combination of both. Maybe in some regards an organism is a conformer (e.g. body temperature conforms to environmental temperature), but in other regards, it may be a regulator (e.g. regulates a consistent heart rate). Homeostasis is a balancing act that encompasses both of these life strategies. They both fall on a spectrum, a continuum of sorts, and thus, the practice of homeostasis will be different for all organisms. Overall, just because you conform to certain things, doesn't mean you don't exemplify homeostasis.
- Is the pressure flow hypothesis and example of diffusion
 - I mean diffusion is a part of the pressure-flow process, but I wouldn't necessarily describe it in the same language that you used.
- How are shivering and sweating examples of internal homeostatic processes?
 - Body temperature is cold, so you shiver to increase muscle activity, this increases systemic cell respiration (remember, a major product of cell respiration is heat), and thus, body temperature increases with prolonged shivering (negative feedback).
 - Body temperature is high, you sweat, sweat is primarily water, water has a high specific heat and high heat of vaporization, this allows sweating to act as an

evaporative cooling mechanism, body temperature decreases with prolonged sweating (negative feedback).

- Are testes and ovaries both sites of gametogenesis?
 - Yes. Spermatogenesis in testes, oogenesis in ovaries.
- What would be the most likely event if corpus luteum does not form? A. endometrial lining does not thicken b. LH surge c. chronic low FSH
 - You tell me, what role does the corpus luteum serve? What is its function?
 - Corpus luteum releases P and E that MAINTAINS endometrial lining this does not mean that it forms it... is where I am confused for this question
 - You're thinking too hard! That's exactly what they're going for in that question. Take a look at this figure [here](#). The formation of the corpus luteum aligns with the luteal phase, which aligns with increased levels of progesterone and estradiol, which aligns with the thickening of the endometrial lining.
 - TYTYTYTYTY! Npnpnpnp
- If a twins are of opposite sex then they are from different eggs right?
 - 2 different eggs and 2 different sperm. These would be DI-zygotic twins for that reason!
- A tumor causes overproduction of a hormone. The symptoms of this are: sweating, increased metabolic rate, high bp, weight loss and increased heart rate. Where would this tumor be? A. posterior pit b. Ant. pi c. adrenal medulla d. Parathyroid gland
 - Do you have any thoughts as to what the answer is? No i dont. Oh wait thoughts I do have those! I thought you were asking for the key
 - No idc about the key lol, I wanna hear what you're thinking!
 - These are symptoms for Hyperthyroidism. So I think thyroid gland must be affected somehow. But since thats not in the option I would go for either hypothalamus or ant pit. And since theres no hypothalamus ill say ant pit!
 - Got it! What's happening is that a tumor in the AP is causing the overproduction of TSH. This high level of TSH overstimulates the thyroid (hyperthyroidism) into producing way too much T3/T4, thus those symptoms.
 - ty! Np!
- Is this true: cytokinins alone promote cell growth but no cytokinesis???
 - Auxins alone promote cell growth, but no cytokinesis. Ahhh ok i gotchu
- Does fertilization happen before or after the secondary oocyte
 - A secondary oocyte is ovulated and fertilized by a sperm cell within the oviduct.
- Why do FSH and LH levels decrease if there's no pregnancy?
 - I explain this in this video [here](#).
- A fish, A bird, A mammal and an amphibian, which of these species form a 4 extra embryonic membranes ? I thought only humans form 4 extra embryonic membranes???
 - This question is basically asking which of these are amniotes.
 - I thought only mammals and reptiles are... the answer options all contain 2 of the species listed above..
 - Birds are amniotes. So it'd be birds and mammals.
- A drug which blocks all of the hormone receptors on the cell membranes of mammary gland cells would prevent cellular activity stimulated by: PROLACTIN right?
 - Yeah.

- Also if protocells are non-living how come they are able to do homeostasis?
 - Just because you undergo homeostasis, doesn't mean you're living. There are other characteristics of life (namely mechanism of inheritance) that are missing from protocells, thus classifying them as non-living entities.
- Is osmoregulation seen in all organisms that can maintain an env that is different than the outside env..
 - If they can maintain an *internal* osmolarity different from their external environment, then yes.
- For gastrulation in frogs, does the sperm fertilizing the egg determine the dorsal or ventral side? I got confused in your video because you bring up the grey crescent and that threw me off.
 - Sperm fertilizes egg at the ventral side, grey crescent forms at dorsal side.
- What happens first-- the fertilization envelope or the egg receptors being clipped off? Also how does Ca²⁺ have anything to do with the slow block-- is that what is inside the cortical granules-- or are the cortical granules already there?
 - The first thing that happens in mammalian fertilization is the sperm cell binding to the ZP3 receptor on the egg's zona pellucida, triggering the start of the whacrosomal reaction. The role of calcium in the slow block of mammalian fertilization is to act as a messenger molecule. An intracellular release of calcium triggers the formation of the cortical granules.
 - I was asking which occurrence happens first?
 - In mammals? In sea urchins Fert envelope or receptors on egg receptors clip off
- What triggers the depolarization of the egg in sea urchins?
 - The fast block that follows the fusion of sperm and egg plasma membranes.
- Are epinephrine and glucocorticoids antagonistic to each other? Extended question: are any of the adrenal hormones antagonistic to each other?? I feel like those from Adrenal medulla actually compliment each other and the ones from cortex have no relationship at all.
- Sertoli cells release both inhibin and ABP right?
- Which of the following would be ADVANTAGES to asexual reproduction. A. higher percentage of parental genes are passed on. B. Faster generation of offspring c. gametes produced via meiosis d. Increased variation in offspring.... I ruled out c and d. How about the other two??? It is possible to choose both or one only
- → Stupid question but are cells haploid before meiosis 1? What I really want to ask tho is: is the secondary oocyte arrested at metaphase 2 haploid or diploid?
- Is organogenesis part of gastrulation? I dont think so
- Where does fertilization occur? I am pretty sure its the oviduct but at this point I am questioning everything I know lol
- Is the thyroid gland endocrine or neuroendocrine?
- During slow block in sea urchins what happens first? Release of calcium ions or release of the enzymes for cortical reaction?
- Fert Envelope in sea urchins is formed from vitelline layer or cortical granules?
- Does invagination during gastrulation only happen in sea urchins?
- I dont understand the difference between oo/spermatogonium and oo/spermatagonia
- What's the purpose of the primitive streak?