BIO 2135 - Animal Form and Function
Midterm examination
Worth either 10% or 15% of your final grade

Friday, February 10, 2012

a) Place your name and student number in the space provided below. Be sure that your name is on the top of each page because the exam **will** be separated to facilitate marking

b) Circle the lab section for your lab. This information is used to get the exam back to you

c) Check to be sure that your exam is complete with a total of 12 pages including this one

d) Answer all questions in the space provided on the exam. Do not transfer answers to the back of the page

e) The exam is out of 85 pts.

Name:_____

Student No:_____

Circle your lab section:

Tue: A1-BSC312, A5-BSC330.

Wed: A2-BSC312, A6(1)-BSC330 A6(2)-BSC335

Thu: A3-BSC312, A7-BSC330

Fri: A4-BSC312, A8-BSC330

•

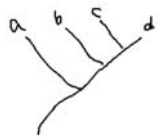
Name:..... Student Number: .....

21pts Part 1. Briefly explain what each of the following biological terms means. Where possible include an example in your definition from a group or an organism to which the term applies.

Ootype

{In parasitic flukes/tapeworms – need to only name one}Special site where {egg is fertilized} {nutrients (yolk) and shell are added – must have both of these for the third point} Idea here is that that know that there is fertilization and also development of the egg prior to its fertilization to get the full three points.

Sister group



{Cladistic term} {relationship between taxa} {One taxa that is the closest relative to all those above it – they can demonstrate this with a diagram} A is a sister group to b,c,d or b is a sister group c and d etc

Choanoderm

{Layer of choanocytes}, {lines part of gastrovascular/inner cavity (part depends on architecture but they don't need to go into that detail}{in sponges/Porifera}

Strobilization

{Formation of medusa}, {asexual reproduction/produces ephyra in Scyphozoa}{transverse buds}

Scolex

{Tapeworm}{used to attach to the wall of the gut/intestine of the host}{has hooks and suckers to attach – both must be stated for the third and final point}

Protostomia

{The blastopore becomes the mouth}{one of two lineage of invertebrates/other is deutersotome}{the use of schizocoel/spiral cleavage no longer defines the group/only blastopore fate defines the group} Many of the students may reflex and list the other characteristics of spiral schizocoel – these are no longer identified as protosomian characters it is ONLY the fate of the blastopore.

Gap junctions

{Type of cell-to-cell connection}{small openings between the adjacent cells}{allows for cell to cell communication – characteristic of tissues}{Pores between the cells formed from connexon)} First point must be there and any two of the remaining three for the three marks

20 pts Part 2 Answer each of the following multiple choice questions by placing and X in the space to the left of the correct choice. There is only one correct answer for each

2.1 The specialized surface of flukes and tapeworms with an outer synctium

_____A. Plasmodium

_____B. Acetabulum

_____C. Pellicle

_____D. Cuticle

__**X**__E. Tegument

2.2 Asconoid sponges have choanocytes only in or on

_____A. Their pinacoderm

_____B. Their ventral surface

_____C. Radial canals

_____ D. Flagellated chamgers

__**X**__E. Spongocoel

2.3 The reproductive polyps in a hydroid colony are called

_____A. Hydranths

__X__B. Gonozoids

_____C. Gastrozooids

_____D. Statocyts

_____E. Statoblasts

2.4 A bryozoan's statoblast is part of which functional system?

_____A: Digestive

_____B: Respiratory

__X__C: Reproductive

_____D: Circulatory

_____E: Nervous and sensory

2.5 Freshwater sponges constantly gain water by osmosis; like protozoans these special organelles remove the excess water.

__X__A. Contractile vacuoles

_____B. Autophages

_____C. Lysosomes

_____D. Protonephridia

_____E. Microfilaments

2.6 In free living flatowrms, when rod like contents of these cells swell and hydrate they form a protective, distatesful mucous covering for the body

_____A. Endocytes

_____B. Mucocytes

_____C. Ectocytes

__X__D. Rhabdites

_____E. Flame cells

2.7 Among ciliates these structures are used primarily in defense or to attach to the substrate.

_____A. Membranelles

_____B. Cirri

_____C. Kinetosomes

__X__D. Trichocysts

_____E. Planars

2.8 These parasitic flatworms are so highly adapted to parasitism they don't even have an intestine of their own

_____A. Planarians

_____B. Blood flukes

__X__C. Tapeworms

_____D. Lung flukes

_____E. Sheep liver flukes

2.9 Skeletons of some sponges are composed of proteinaceous fibers called

_____A. Spiculin

_____B. Mysoin

__X__C. Spongin

_____D. Scleotin

_____E. Actin

2.10 Sexual reproduction in ciliates involves a process called.

__X__A. Conjugation

_____B. Gametogany

_____C. Sporogony

_____D. Cohabitation

_____E. Copulation

Name:..... Student Number: .....

2.11 Which of the following forms of reproduction is not seen in protists.

_____A. Conjugation

____**X**___B. Copulation

_____C. Multiple fission

_____ D. Budding

_____E. Binary fission

2.12 Of the two dimorphic forms found in Cnidaria this one is usually free swimming and sexual

_____A. Sycon

_____B. Polyp

_____C. Ascon

____**X**___D. Medusa

_____E. Leucon

2.13 The colony of bryozoans is referred to as.

_____A: polypides

_____B: a zoecium

____**X**___C: a zooarium

_____D: cysides

_____E: None of the above

2.14 The repeated segments of the body of the tapeworm are called

____**X**___A. Proglottids

_____B. Opercula

_____C. Scolices

_____D. Acetabula

_____E. Miracidium

2.15 Specialized cells in sponges are capable of doing all but one of the following

____**X**___A. detect environmental stimulii

_____B. Regulate the flow of water through the sponge

_____C. Secrete the skeleton

_____D. Extract nutrients from water

_____E. Produce gametes

Name:..... Student Number: .....

2.16 Which of the following statements best describes the rationale for applying the principle of parsimony in constructing phylogenetic trees?

_____A. The molecular clock validates the principle of parsimony.

__X__B. Similarity due to common ancestry should be more common than similarity due to convergent evolution .

_____C. Parsimony allows the researcher to "root" the tree.

_____D. The out-group roots the tree, allowing the principle of parsimony to be applied.

2.17 A taxon, all of whose members have the same common ancestor, is

__X__A.monophyletic .

_____B. paraphyletic.

_____C. polyphyletic.

2.18 The mesodermally derived tissue of flatworms includes this loose tissue that fills the spaces between other more specilaized tissues and organs and the body wall.

_____A. Mesohyl

_____B. Mesoglea

_____C. Vacuolated tissue

__X__D. Parenchyma

_____E. Fibrous connective tissue

2.19 Between the two sheets of cells that make up a sponge is a jellylike layer referred to as the

_____A. Mesoderm

_____B. Mesenchyme

_____C. Mesoglea

__X__D. Mesohyl

_____E. Endocyme

2.20 In lophophorate this coelom extends into the tentacles

___**X**___A. Mesocoel

_____B. Metacoel

_____C. Axocoel

_____D. Exocoel

_____E. Endocoel

25 pts Part 3: Complete the following sentences using the appropriate terms. Place the term in the space in the sentence or at the end of the sentence.

3.1 Gastrozooids have this responsibility in a hydrozoan colony. **Feeding/digestion**

3.2 These flatworm parasites always have a mollusc, usually a snail, as part of their life cycle. **Flukes/Trematodes/liver fluke**

3.3 The name for the outer layer of cells in a sponge. **Pinacoderm**

3.4 The part of a bryozoan that includes the lophophore and retractable parts of the body. **Polypide**

3.5 In this type of protozoan reproduction in which one cell divides into numerous daughter cells. **Multiple**

3.6 Protista are traditionally considered to be algae if they do this and protozoans if they do not. **Photosynthesis/ autotroph**

3.7 The type of fission that results in two daughter cells of equal size. **Binary**

3.8 Sponges are organized at this grade. **Cellular**

3.9 The water pumping system in a sponge is also called this type of a system. **Aquiferous**

3.10 These cover the surface of a bryozoan's tentacles. **Cilia**

3.11 The cord of connective tissues transports nutrients between members of the colony. **Funiculus/Coenosarc**

3.12 These light sensitive structures make a planarian look cross-eyed (two words). **Eye spots/ Eye cups**

3.13 In most parasitic fluke life histories this free-swimming, ciliated larva, enters a snail. **Miracidium**

3.14 The cells of the tapeworm tegument don't have cell walls between each cell. It's a condition referred to as this. **Syncytium**

3.15 Another name for a contractile vesicle is this type of expulsion vesicle. **Water**

3.16 The dual roles of cells lining the cnidarian gastrovascular cavity is reflected in their name. **Nutritive-muscular**

3.17 Like other lophophorates and deuterostomes, a bryozoan coelom is described as this. **Enterocoel/tripartite**

3.18 Like the trigger of a gun, this structure is responsible for firing the cnidarian's cnidocyte. **Cnidocil**

3.19 In leuconoid sponges, the choanocytes are found inside these. **Chambers**

3.20 The opening, in all types of sponge architectures, that water pumped by the sponge exits. **Osculum**

24 pts Part 4: Answer 4 of the following 7 questions in the space provided. Each is worth 6 points. Do and extra question for a 6 point bonus.

4.1. Describe the path that water takes as it passes through a syconoid sponge – How has the efficiency of filter feeding be improved in other sponge architectures?

{Ostia (not porocyte that's only asconoid) and Incurrent canal} {Radial canal} {prosopyle links incurrent and radial, apopyle links radial and spongocoel} {Spongoceol}{Out the osculum}
They will usually get the sequence incurrent, radial, spongocoel and out the osculum – that is worth 4 points, one more point is they get the apopyles and/or prosopyle}
Improve efficiency: {Place choanocytes inside chambers where water slows}final point for the total of six points

4.2.What is an autapomorphy? Use each of the four classes of Cnidaria and give one autapomorphy for each.
OR
What is an autapomorphy. Use the four Eumatazoa phyla we have studied to give one autapomorphy for each phylum.

Definition: {a shared derived character}{that is used to define a taxonomic group} 2 points in both questions options for the definition

Cnidaria (point each only need to state one}
1. Anthozoa any one of biradial symmetry, siphonoglyphs, septa with muscles gonads in gastrodermis. (nematocysts without an operculum
2. Scyphozoa: Rhopalia on medusa
3. Cubozoa: Individual polyps become medusa, unique eye with lens, pedalia
4. Hydrozoa: Medusa formed from lateral buds, dimorphic with medusa and polyp, velum in the medusa

Animalia (point each only need to state one}
Porifera: totipotent cells but no tissues, aquiferous system, assymetric body plan (no oral aboral axis)
Cnidaria: Cnidocytes, epitheliomuscular cells, planula larva, polyp body
Platyhelminthes: Incomplete gut, complex reproductive system for hermaphrodism
Bryozoa: Colonies that grow by budding, body of a cystid and polypid, funicular system, introvert

4.3. The beatings of cilia and flagella have some things in common and others that differ. What are the similarities and differences?

Similarities: {Structure is a 9+2 arrangements of microtubules – must say mictrotubules and not just 9+2 to get this point}{Microtubules connected to each other with dynein arms} {Dyenin motor on the arm walks along the adjacent microtubules – or statements that they understand how the dynein motor works.}{use an underlying pellicle to reinforce plasma membrane against force}

Differences: Cilia are shorter/more numerous than flagella which are longer and either single or paired}{How they beat: Cilia beat using a recovery stroke at right angles to power stroke}{Cilia beat in a metachronal wave}– Flagella have two ways of beating {planar where the recovery and power stroke are in the same plane/nochange in angle} or {Spins in helicoid pattern}

4.4. Describe the life cycle and different stages of the of the sheep liver fluke.

Adult – In the liver /bile ducts mate and produce fertilized eggs
Fertilized Egg – pass into the digestive tract and in the fecal material
Miracidium – hatches from the egg when the egg washes into water and swims to snail
Sporocysts and Redia stage occurs in the snail increase numbers with larval amplification
Cercaria – from snail swims and turns into metacercaria
Metacercaria – dormant protected stage that the sheep eat

Point each for these 6 elements – no part marks

4.5. Compare the tentacles of a cnidarian and a bryozoan – how are they similar and how do they differ? HINT A comparative table would be a great way to answer this question.

Any similarity maximum 3 and Differences again maximum of three to a total of six points

	Cnidaria	Bryozoa
Similarities	• Hollow • Used to capture food • Important surface for diffusion • Hydrostatic skeleton	
Differences	• Covered in cnidocytes • Cavity is gastrovascular (Coelenteron) • Food is captured as prey • Don't pump water	• Covered in cilia • Cavity is coelom • Food is captured as particles (filter feed) • Pump water

4.6. How do free-living flatworms prevent self-fertilization and why do they have to?

Why do they have too: {The purpose of meiosis is for genetic mixing and variability}. {Self fertilization prevents this}

Prevent: {Fertilization (combination of the egg and sperm} and {insemination (sperm transfer between two individuals} are separate events. {Sperm is stored in a seminal receptacle after mating}{Eggs produced after the sperm has been stored and eggs pass by the seminal receptacle}

4.7. What are trophozoites and merizoites, how are they related to each other and where would you find them?

{stages in the malaria/plasmodium life cycle}{Found in the human host}{Both in the blood of the host} {Merozoites are in the blood plasma – not the cells}{Trophozoites are inside RBCs feeding on red blood cell}{Trophozoites turn into merozoites when released in blood and merozoites become trophozoites when they enter the red bloof cell}{The increase in numbers from merozoite to trophozoite is schizogony}