

## Questions for Lecture 14: Glycobiology of Fertilization and Reproduction

Thursday, May 12, 2016

1. What is sexual reproduction?  
Exchange of genetic material.
2. What are advantages of sexual reproduction?  
Purging mutations  
Faster evolution/recombination
3. What are disadvantages/costs of sexual reproduction?  
Need for two sexes  
Loss of co-adapted gene complexes.
4. How do gametes acquire their glycocalyxes?  
Sperm in testes, during epididymal transit and in contact with seminal fluid.  
Egg in follicle and from granulomas/cumulus cells
5. What are the different ways sperm acquire glycans?  
ER-Golgi synthesis in testes  
Extra-cellular glycosylation by luminal transferases in epididymal lumen.  
Transfer of gangliosides and GPI anchored glycoconjugates  
Epididymosomes
6. How do mammalian eggs avoid polyspermy?  
Sperm reservoir  
Cortical reaction
7. How can the same protein exert opposite functions in male and female reproductive tract?  
Via different glycoforms
8. What are examples of molecular gamete recognition  
Sperm ZP binding (glycan dependent)  
Sperm Izumo-Egg Juno binding protein-protein)
9. What are the parallels between leucocyte rolling and implantation?  
L-selectin on blastocyst
10. Are pregnant female mammals generally immune suppressed?  
No, but rather they maintain active immune tolerance locally.
11. How can female modulate the pore size of cervical mucin?  
By changing glycosylation of cervical mucins.
12. What glycans are deployed by trophoblast cells to help with maintenance of trophoblast invasion?  
Syncytin 1 & 2  
MUC 16  
Poly Sia  
Glycodelin A
13. How can fetal cells contact tissue resident NK cells?  
By detaching from placenta and invading solo.
14. How can sperm avoid non-self recognition?  
No MHC  
Lots of self-glycans