

Questions for the Maclaren et al paper:

1. Figure 2: they figure out that the optimal time for transplantation is from P3 to P7 donors, after the progenitors have completed their proliferation in the donor retina. Could you use select FACS sorting to select specifically the cells that just have completed their division (using brdu labeling) in the donor before transplanting them into the host? Elaborate your answer, by explaining the logic behind FACS and brdu labeling of cells.
2. Explain in detail what is it gained by doing FACS sorting of the cells from an NRL-GFP transgenic mouse, that can not be achieved with a ubiquitous GFP mouse. Elaborate in your answer by indicating the different outcomes of the experiment if the cells come from the NRLGFP or from the actinGFP mouse.
3. Figure 3c: in the inset they claim that the collocation of green and red suggests that the cells are making synapses.
 - a. Describe the logic that they follow to make that assumption
 - b. Describe in detail what would you do to prove that these two fluorescent cells make synapses with an electron microscope (NOTE: this is a trick question, and the trick is related to the colors of the cells. It can be done, but it is not trivial. So try to figure out where is the trick here)
 - c. Describe in detail what kind of experiment you would do to prove that the green cell and the red form a functional synapse by using intracellular recording methods. Elaborate on the kind of equipment that you will have to use: microscopes, lasers, electrodes, etc..., and how would you use them.
4. Figure 3 a: describe in detail all the stainings that they are using to get each of the colors in the picture, and the steps required to get the final picture.
5. Figure 4f: Describe all the steps required to get the pupil to contract as described in this figure. *“The light hits cell X, then cell X does something to cell Y, then...., then..... it goes to this part of the brain (or not), and it goes to this muscle, and then the pupil contracts. “.*
6. What are the main obstacles for transplanted neurons as a treatment for neurological diseases? List and elaborate on your answers. Use Parkinson’s disease as an example to be treated by neuronal transplantation.
7. Stem cells can give rise to all kinds of cell types. Why not graft stem cells directly into the retina of people that have suffered neuronal losses? At least, mention two limitations and elaborate on them.