

Wednesday practice exam question

In the paper by Nelson, *et al* (Chlamydial IFN- γ immune evasion is linked to host infection tropism), the authors observe in **figure 3** that human and mouse epithelial cells respond differently to bacterial infection and IFN- γ stimulation.

a. Which panel(s) of figure 3 indicates how the human bacteria handle the human host cell response? What do the multiple conditions in this experiment reveal about the bacteria? (150 words max)

b. How might the information revealed in this paper about the responses of the murine and human hosts be used to develop more effective research tools for the study of chlamydial infections in humans? (60 words max)

question a:

panel 3C (2nd and 3rd sets of bars, "L2" and "D")

1st (black) bar: infection without IFN- γ reveals that the bacteria are capable of replicating successfully in the host cells.

2nd (light grey) bar: Proliferation of human chlamydia bacteria is inhibited by the host cell response.

3rd (mid grey) bar: infection + IFN- γ + Trp indicates that it is the depletion of tryptophan, specifically, which is inhibiting bacterial growth.

4th (dark grey) bar: infection + IFN- γ + Indole indicates that the human bacteria are able to thrive despite the loss of tryptophan, if they are provided with the trp precursor, indole.

question b:

The murine model of infection can be made to more closely represent human infections. One might engineer a transgenic mouse to express IDO, under the control of an IFN- γ inducible promoter, in the epithelial cells of the genital tract.

(Further, the mouse should be an *ligp1* knockout, but this is beyond what is being asked.)