A. Briefly describe overall research program at your laboratory. My lab is currently mapping spatial distributions of nuclear transport proteins (importins and transportins) in developing sea urchin embryos to better understand how these proteins could impact cell fate decisions. We are also investigating the effects of specific cell signaling pathways on the temporal and spatial distribution of importins. We have successfully cloned all of the KAP-β importins and transportins and, using wholemount in situ hybridization, have determined distributions of importins KPNB1, IPO5, IPO9, and IPO11 and the transportin TNPO1/2. During Summer 2018, we hope to complete this investigation, determining distributions of all of the other importins and transportins. This project provides a critical foundation for expanding our knowledge of the roles of nuclear transport in regulation of transcription factor segregation during early developmental events.

B. Briefly describe specific project(s) for your teacher: I plan to examine effects of perturbing canonical Wnt signaling on the distribution of specific importins. These experiments will be performed in sea urchin embryos and involve exposing the embryos to chemicals that disrupt canonical Wnt signaling during specific developmental periods and then using reverse transcriptase PCR to determine whether this alters expression of the importins. We may also use wholemount in situ hybridization to determine where the importins are expressed after treatments.

C. Will any other people (post docs, grad students, undergraduate students, colleagues, etc.) be involved directly with your teacher? The teacher would work with me, and the other undergraduate research students in our lab group.

D. Will you require any advanced reading/preparation for the teacher? If yes, please briefly describe. I would recommend reading a few papers on the following topics: nuclear transport proteins, sea urchin development.