A. Briefly describe overall research program at your laboratory. The overall research program in my laboratory is based on biomedical research to study reproductive biology and toxicology, protein functions in cancer biology, cell-cell and cell-matrix interactions. Currently we are involved in studying molecular mechanism of environmental pollutants.

B. Briefly describe specific project(s) for your teacher: The major focus will be to test if prior exposure of cultured cells to humic substances blocks toxic effects of PAHs. We will perform cell viability assay, enzymatic lactate determination in media, immunochemical and flow cytometric analysis as general techniques. In addition, we would be interested to study the tight junctions of cells. Tight Junctions are present in the luminal surface of epithelia where it creates an intercellular barrier by limiting ability of solutes, water and immune cells to travel paracellular space. Thus the passage of material is controlled since they can only pass through the cell membrane. The earlier available evidence indicates that the PAHs bound to the humic macromolecules become unavailable for uptake possibly through biological membrane. This hypothesis will be tested in the proposed project using mammalian cell cultures. The purpose of this research is to study the expression of ZO-1 protein in human breast cancer cells following treatment with PAHs or humic substances. Data now suggest that ZO-1 once delocalized from tight junction (TJ), could be implicated in the regulation of tumor-progression. ZO-1 is a TJ protein that is located on cytoplasmic membrane surface precisely at sites of cell-cell contact.

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, one undergraduate research student and one research technician.

D. Will you require any advanced reading/preparation for the teacher? If yes, please briefly describe. In advance, the teacher can study books or paper on cell culture techniques. I will be able direct the teacher on reading materials via email contact.