One of the major challenges of biological research is to understand how proteins located on the cell surface transmit signals to the inside of the cell. Using the mouse as a model system our laboratory has studied one such protein, Qa-2 protein, which controls the rate of cell division of preimplantation embryos. Qa-2 is attached to the outer layer of the cell membrane by a glycosylphosphatidylinositol (GPI) linkage, which does not traverse the cell membrane. Thus, cell surface Qa-2 protein cannot initiate a signal on its own, but requires a partner molecule(s). In order to search for the partner molecule(s) for Qa-2 protein we have utilized two imaging techniques: immunofluorescence and scanning electron microscopy (SEM). Due to the paucity of material available from preimplantation embryos and due to the abundance of Qa-2 protein on T lymphocytes (T cells), we have used the latter for our studies. We tested the hypothesis that Qa-2 protein must be located in lipid rafts to initiate signaling by co-crosslinking Qa-2 to another molecule, CD4, located outside of the lipid rafts. As a control, we used co-crosslinking with CD8, known to be located in the lipid rafts. We used the above techniques to simultaneously label Qa-2 and lipid rafts before and after co-crosslinking. This basic research on T cells has the potential to be applied to preimplantation embryos to assist evaluation of embryo health after in vitro fertilization (IVF).

### Materials and Methods

#### Crosslinking:

- **Before Qa-2 crosslinking:**
  - T cell
  - Anti-Qa-2
  - Anti-CD4/8

- **After Qa-2 crosslinking:**
  - Anti-Qa-2
  - Anti-CD4/8

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**Imaging of Qa-2 and Lipid Rafts:**

- **Fluorescence:**
  - DIC
  - Qa-2
  - CD8

- **Electron Microscopy:**
  - DIC
  - Qa-2
  - CD8

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**State of the Art**

- This poster presents techniques for the direct imaging of Qa-2 and lipid rafts on T cells.
- The Keck microscope allows State of the Art imaging using the DIC, epi-fluorescence and confocal modalities simultaneously.
- Visualization of single surface molecules on T cells using scanning electron microscopy (SEM) will provide important information about their location.

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**References**


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