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Primary research interests:

1. How do general anesthetics work? Mostly at the biophysical/molecular level:

Some current projects:

- a) Photolabeling and mass spectrometry of proteins to discover binding sites.
- b) Fluorescence spectroscopy of anesthetic binding proteins.
- c) Target discovery in brain extracts using novel fluorophore.
- d) In vivo target discovery in *C. elegans* using fluorescence imaging.
- e) High throughput screening for novel anesthetics.
- f) X-ray crystallography of anesthetic/protein complexes.

2. Does anesthesia, surgery or sepsis make Alzheimer's disease worse?

Some current projects:

- a) Exposure of transgenic mice to anesthesia
(behavior, immunohistochemistry, ELISA, etc)
- b) Incremental effect of adding surgery and sepsis to anesthesia
- c) Rank-ordering of anesthetics for cytotoxicity in transgenic cells.
- d) CSF biomarkers in patients having anesthesia.
- e) Model systems (*drosophila*)
- f) Medicare database mining for associations between surgery and dementia.