- Discovered the first link between a leukemia translocation protein and the mitotic spindle checkpoint and its promotion of aneuploidy. This work provides the basis for novel therapeutic strategies to inhibit proteins/enzymes that promote mitosis in leukemia.

- Identified new transcriptional targets of the AML1 transcription factor, which is one of the most common genes mutated or translocated in human leukemias. Successfully performed Genome Wide Location Analysis in collaboration with Dr. John Doe's Lab at Big University, to screen over 8,000 human promoters that are bound by the AML1.

- Developed the Elastigraph, an apparatus that detects vascular stiffening in arterial tissue, and the methodology for quantifying arterial stiffness. Worked with a material design expert and biomedical engineer to design this instrument, which is modeled after a material science testing device and is capable of producing sensitive stress-strain curves of isolated mouse or rat vessels. This machine and method is used to quantify vascular stiffening in several projects in the laboratory.

- Designed experiments which aided in the development of automation technologies for electron microscopy.

- Significantly improved the stability and efficiency of the Filter Diagonalization Method by developments such as multi-windowing, multi-scale Fourier basis, FMM2K regularization and an efficient signal doubling scheme.

- Implemented the use of small-volume crystallization screening in a 96-well format which increased productivity by decreasing the amount of sample required for preliminary screening.

- Constructed novel protein fusion vectors to optimize rapid protein purification and increase solubility.

- Utilized electron microscopy for the evaluation of preparations of detergent-solubilized and nanodisc-incorporated membrane proteins. This evaluation led to the determination of the samples' suitability for crystallization. It also provided important information about the monodispersity and homogeneity of the samples which was not revealed by more traditional techniques such as size-exclusion chromatography.

- Devised a new method of assessing early atherosclerotic lesion development utilizing in situ laser scanning confocal microscopy (LSCM). This method is now being used in multiple projects within the lab and with external collaborators to assess early atherosclerotic lesion development.

- Rapidly transitioned from biophysics to cell signaling and leukemia research, evidenced by data contribution to a successful $250,000 NIH grant within 4 months of hire date.

- Developed a protocol for refining protein NMR structures using implicit solvent and advanced sampling techniques. Successfully applied it to generate native-like protein folds from limited NMR data.

- Successfully used immunoaffinity purification and mass spectrometry to greatly expand the list of novel cellular substrates of ISG15 modification, thus facilitating the understanding of the *in vivo* role of this interferon induced protein.

- Designed an automated vascular perfusion apparatus. Worked with a biomedical engineer to construct a vessel bath chamber capable of performing 'pulse-chase' experiments with automation in isolated vessel segments. This apparatus significantly decreased the labor involved in performing vascular perfusion experiments.

- Supervised, trained and mentored students in the lab. Taught students to conduct cell and molecular biology experiments (i.e. cell culture, flow cytometry, real-time PCR, macroarray gene chip) and animal tissue experiments (i.e. perfusion, quantitative fluorescence microscopy, vascular stress-strain analysis) and to analyze the results.

- Managed team of research technicians in conducting animal experiments. The team processed tissue from large cohorts of mice. These data culminated in a report that was the first to describe a role of TLR2 in an experimental model of atherosclerosis.

- Generated figures and text for portions of 3 NIH RO1 grants, was the primary author of 1 funded NIH RO1 grant, and wrote portions of Request for Funding proposals submitted to private funding sources.

- Served as lab radiation safety officer, which included documenting regular radiation surveys and overseeing equipment decontamination.

- Received protein crystallography beam time through competitive peer-reviewed proposals at the Stanford Synchrotron Radiation Laboratory and the Advanced Light Source at UC Berkeley.

- Saved the laboratory approximately $2,400 per year by finding alternative vendors for lab supplies and negotiating new contracts.