

Sample Project Graphic

Ge Wang, SBES, "Optical Leukocyte Imaging for Novel Cancer Therapy" (NIH)

This project consists of the following three layers: the bioassay layer, the imaging layer, and the treatment layer. In the bioassay layer, a biopsy sample of a patient's cancer will be implanted into the mouse, while the leukocytes from a donor(s) will be labeled with fluorescent probes and transferred to the mouse. The bioassay layer serves as a test bench for the leukocytes infiltrating and cancer-killing activities. In the imaging layer, optical molecular imaging will be performed *in vivo* to select the most effective leukocytes to be used in the treatment layer. In the treatment layer, the selected leukocytes will be infused to the patient, and the therapeutic process will be monitored using the same imaging approach. Our overall idea on development of optical molecular imaging for application in the GIFT is illustrated in Figure D.1. This project is only the initial step in a larger research project, and provided that this step is successful, we envision a much more magnificent future for cancer treatment. *This project will address several important clinical concerns in the GIFT and also exemplifies the transition of the optical molecular imaging technology from the bench top to the bedside.*

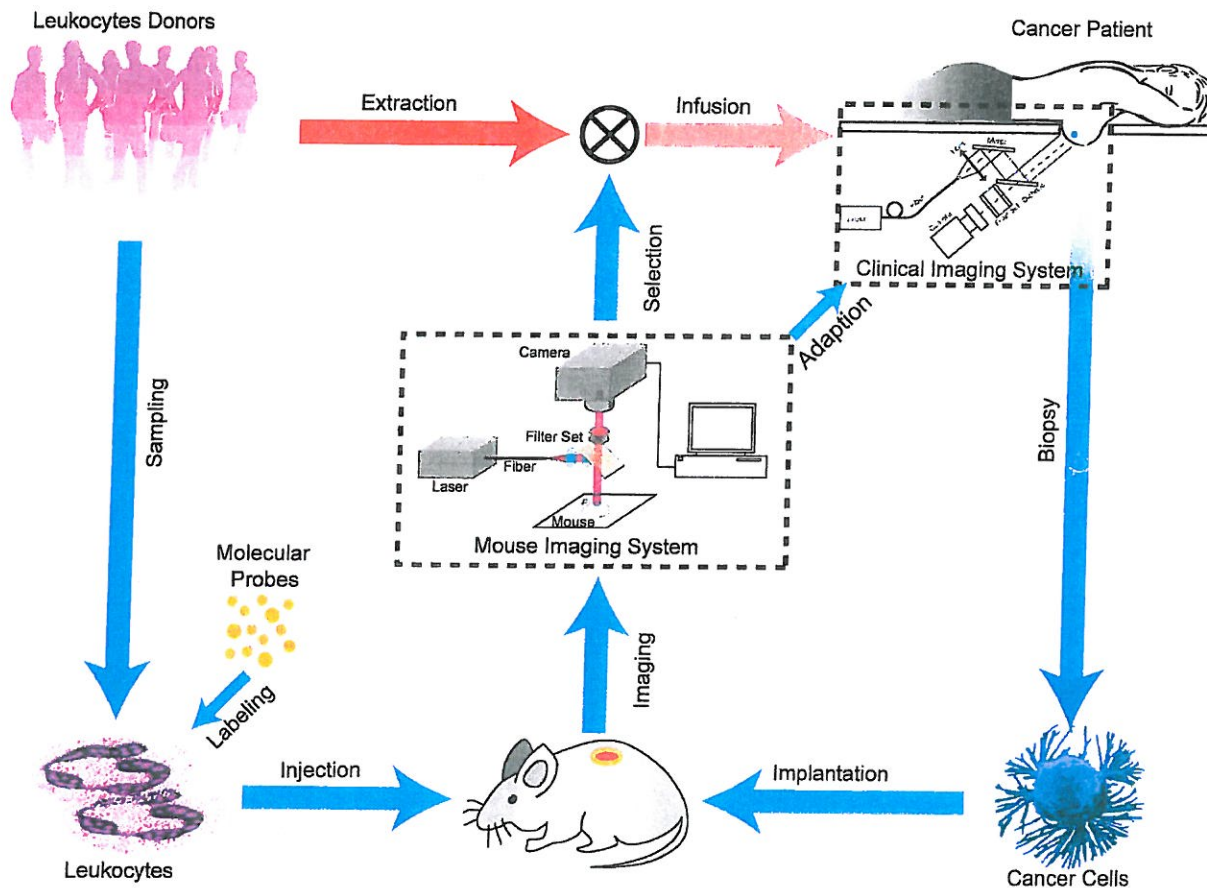


Fig. D.1. Optical molecular imaging for granulocyte infusion therapy (GIFT). Since 2002, Dr. Ge Wang's group has been devoted to optical molecular imaging research based on bioluminescence and fluorescence. In 2007, Dr. Zheng Cui's group discovered the cancer-killing effect of the human granulocytes and proposed to transfuse granulocytes from cancer-resistant donors to cancer patients. Our primary synergic idea is to label the donor's leukocytes with fluorescent molecular probes, transfer the labeled cells into a mouse, and monitor the migration pattern of these cells to identify the best donor-recipient pair as well as image the patient similarly for GIFT optimization (Wang G, Cong WX, Shen HO, Cong A, Stehle, J, Cui Z: Optical Leukocytes Imaging. Provisional Patent Application, 01/07/08).