

## **Shao-Chun Wang, PhD**

Assistant Professor

Department of Surgery; Division of Research

### **Description of Research:**

Dr. Wang's research interest is to explore novel therapeutic approaches to target colorectal cancer liver metastasis. The liver is a vital organ of digestion and metabolism, and is also the most common metastatic site of human cancer. Liver metastasis is therefore a major clinical challenge in cancer therapy. Expression of the cyclooxygenase enzyme COX-2 gene has a critical role in cancer progression, especially for tumor metastasis. However, directly targeting COX-2 enzyme activity with specific inhibitors in cancer patients has been associated with fatal cardiovascular side effects. Dr. Wang hypothesizes that the COX-2 promoter is an ideal expression system to specifically targeting cancer cells at the primary lesion and the distant metastatic sites, with impact on tumor vasculature and the microenvironment. The major directions in my research include (1) we will develop the COX-2 promoter based targeting system *in vitro* and *in vivo* and test the efficiency of targeting liver metastasis of colon cancer. A suicidal gene therapy strategy will be implemented to test the therapeutic efficacy using this strategy. This system also has the advantage of further enhancing expression of the therapeutic gene by the chemotherapeutic agent 5-fluorouracil (5-FU), which stimulates the COX-2 promoter activity. (2) Dr. Wang will use a colon cancer cell line with enhanced liver tropism to investigate the essential genetic factors contributing to tumor invasion and metastasis of colon cancer to the liver. Success of the proposed study can (1) lead to specific and effective therapeutic approach to systemically eliminate cancer cells, (2) provide a novel approach to investigate tumor biology in the microenvironment, (3) warrant the future development of efficient imaging approach for cancer detection and prognosis, and (4) given the essential and unique role of COX-2 in cancer progression, the proposed system can be applied to other cancer types with metastatic progression.

### **Collaborations:**

Dr. Wang is a new faculty member in the Department of Surgery. He is developing a line of collaboration with Drs. Waltz and Lentsch.