

Stephen D. Zucker, MD

Associate Professor

Gastroenterology Fellowship Program Director

Department of Internal Medicine; Division of Digestive Diseases

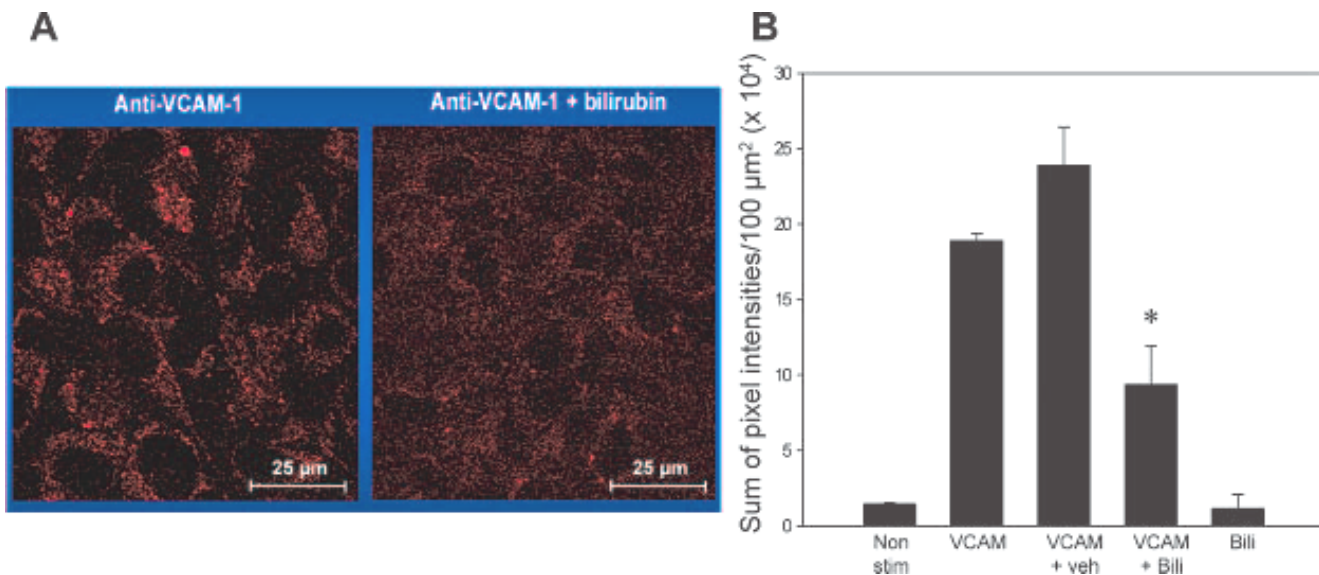
Description of Research:

The focus of Dr. Zucker's research is on elucidating the physiological functions of unconjugated bilirubin. Current work specifically examines the role of bilirubin both as an endogenous anti-inflammatory agent and in the chemoprevention of colorectal cancer. His studies have shown that bilirubin attenuates lipopolysaccharide hepatotoxicity, suppresses carrageenan-induced hindpaw inflammation, and ameliorates ovalbumin-stimulated asthma. Ongoing experiments employ both in vivo and in vitro methodologies to systematically elucidate the mechanism(s) by which bilirubin exerts these effects. Dr. Zucker has further demonstrated that bilirubin decreases the viability of colon cancer cells in vitro through the induction of apoptosis, and that this effect is mediated through activation of the mitochondrial pathway. Bilirubin treatment is well-tolerated in vivo, and is associated with a marked reduction in tumor number in animal models. It is anticipated that his ongoing studies will provide new insight into the role that bilirubin plays in the regulation of inflammation and in the modulation of intestinal tumorigenesis.

Collaborations:

Dr. Zucker collaborates with Dr. Sherman on studies examining the association between serum bilirubin levels and the incidence of colorectal cancer and the effect of highly active retroviral therapy on the hepatic metabolism of drugs and xenobiotics.

Representative Figure:



Bilirubin inhibits the cellular production of ROS in response to VCAM-1 stimulation. Confluent monolayers of mHEVC cells were incubated in the presence of bilirubin (20 µM) or the potassium phosphate vehicle before stimulation with anti-VCAM-1-coated beads. (A), Representative confocal images of anti-VCAM-1-treated mHEVC cells treated with vehicle (*left panel*) or bilirubin (*right panel*). (B), The increase in rhodamine fluorescence over 30 min in unstimulated (Nonstim) and anti-VCAM-1-stimulated (VCAM) cells in the presence or absence of bilirubin (Bili) or vehicle (Veh). Data reflect the mean (\pm SEM) of two separate experiments (two replicates per experiment). *P < 0.05 vs anti-VCAM-1-stimulated cells. Fig. 7 from J. Immunol., 2005; 174: 3709-3718.