Biomarkers and Molecular Imaging in Barrett’s Esophagus

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Biography: Dr. Rhonda F. Souza trained at Howard University, Beth Israel Hospital (Boston), and the University of Maryland Medical Center. She is a Professor of Medicine and Co-Director of the Esophageal Diseases Center at the University of Texas Southwestern Medical Center and the Dallas VA Medical Center. Dr. Souza is the current Chair of the GI Oncology Section of the American Gastroenterology Association Institute Council. Dr. Souza’s laboratory focuses on exploring molecular mechanisms through which the gastroesophageal reflux of acid and bile mediates the development of Barrett’s esophagus. Her laboratory has demonstrated differences between esophageal squamous cells in patients who have gastroesophageal reflux disease (GERD) with and without Barrett’s esophagus in the signaling pathways that are activated by acid and bile salts. Those findings have formed the basis for her highly original perspective on why Barrett’s esophagus develops in only a minority of GERD patients. Her laboratory also focuses on how GERD might contribute to carcinogenesis in Barrett’s esophagus. Most recently, she has shown that gastroesophageal reflux elicits a chemokine-mediated inflammatory injury (rather than a caustic chemical injury) as the initial pathogenetic event in human reflux esophagitis, a finding that challenges long-held views on the development of that condition. In partnership with Dr. Stuart Jon Spechler, Dr. Souza combines traditional in vitro approaches to the study of disease with novel, in vivo, translational approaches involving perfusion of the human esophagus with acid or bile salts during endoscopic examination or inducing acute reflux esophagitis by stopping acid suppressive therapies in those with GERD. Dr. Kerry Dunbar, a member of our multidisciplinary, translational research program in esophageal disease as part of the UTSW-VA Esophageal Diseases Center, has special expertise in advanced endoscopic imaging (including confocal laser endomicroscopy) and uses this expertise to imaging esophageal diseases in our patients in vivo. Dr. Souza’s research program is currently funded by both the NIH and the Department of Veterans’ Affairs

Abstract: Barrett esophagus, a squamous-to-columnar cell metaplasia of the esophagus, predisposes to esophageal adenocarcinoma. For patients with Barrett’s esophagus, endoscopic surveillance, using standard, high definition while-light endoscopes, to detect dysplasia is the primary cancer prevention strategy recommended to decrease morbidity and mortality from esophageal adenocarcinoma. This strategy has not been effective, however, as evidenced by the continued rise in the frequency of esophageal adenocarcinoma. To overcome the challenges associated with our current cancer preventive strategy, new endoscopic imaging techniques are being explored as well as the use of molecular biomarkers. By combining these newer imaging modalities with fluorescent-tagged molecular biomarkers, in vivo molecular imaging to identify areas of concern during “live” endoscopy has garnered intense interest both for clinicians and scientists. This seminar will highlight the issues with our current strategy of endoscopic surveillance to detect dysplasia, concepts regarding the use of molecular biomarkers, and “proof of principle” studies demonstrating the potential of in vivo molecular imaging to detect early neoplasia in Barrett’s esophagus.

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