



## Satish K. Singh, MD

## Young Clinician Award 2008

### Investigator Profile

#### Education

- MD, Boston University
- BA, Boston University
- Residency, University of Rochester
- Fellowship, Yale University School of Medicine



#### Clinical /Professional Appointment

- Assistant Professor, Department of Medicine (Section of Gastroenterology), Boston University, School of Medicine
- Director, Perkin-Elmer Center for Advanced Cell Imaging, Boston University, School of Medicine

#### Recent Honors and Awards

- CIMIT Career Development Award
- Chair, NTR01 Clinical Studies Working Group, NIH/NCI
- Evans Foundation Research Award (2001 & 2008)
- AGA/ADHF Miles & Shirley Fiterman Basic Research Award (2001)
- Yale Junior Faculty Award (1999)

### Impact on Care

- Colorectal cancer (CRC) is the third leading cause of cancer and cancer death in the US. CRC typically begins as a visible polyp, half of which are adenomatous which are considered precancerous, or dysplastic.
- Adenomatous polyps generally require 10 years of growth to become malignant. As such, early systematic removal/ablation of polyps at endoscopy has been shown to prevent the subsequent development of CRC.
- Approximately 4 million colonoscopies are performed annually. The existing demand for preventive colonoscopy far exceeds available resources.
- Optically-guided biopsy would enable excision and/or ablation to be performed, while polyp retrieval might be rendered optional for nondysplastic polyps.
- Substantial savings of time and pathology resources.

### Abstract

Endoscopy has the potential to prevent certain colonic and esophageal cancers, but it is a screening and surveillance modality that has been suboptimally applied - largely due to the limitations of the endoscopic view for detecting precancer and cancer. Broad view imaging enhancements such as narrow band imaging, chromoendoscopy, and autofluorescence endoscopy appear to improve dysplasia detection rates, but have low specificity. At present, it is virtually impossible to distinguish a dysplastic from a nondysplastic polyp by its endoscopic view.

Thus, integration of fiberoptic probes into familiar, standard biopsy tools can provide endomicroscopic and/or spectral images that permit primary or complementary *in situ* histopathological guidance by the operator (interpreting microscopic images) or by computer via spectroscopic tissue recognition algorithms. I am committed to advancing this area of research and currently have IRB approvals for three separate studies that seek to validate the use of ESS biopsy tools for dysplasia detection in (1) average-risk CRC screening programs, (2) in patients with inflammatory bowel diseases, and (3) in Barrett's esophagus. Newer biopsy tools are being developed that may represent a quantum leap forward for integrating optical probes into diagnostic and therapeutic endoscopic tools.

