

# Volume Holographic Imaging System (VHIS) Endoscope

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## Technology description

### Background

An endoscope is an instrument that allows a doctor or surgeon to look inside the body through existing openings or through small incisions. The endoscope is a metal tube that has a small light source and camera at one end and an eyepiece at the other. Endoscopes may be made from a rigid tube or, more often, from a flexible tube that allows the surgeon to freely move and adjust it as it enters the area that is being observed. Advances in the technology over these past several decades have added a wide variety of optional equipment to be used with the basic endoscope.

### Invention

The investigators have developed a hand-held version of the Volume Holographic Imaging System (VHIS) microscope suitable for use as an endoscope to be employed in a clinical setting by a physician. The imaging system is modular by design, with interchangeable components, and offers two illumination options. The endoscope barrel is tailored to the particular requirements of the application, and can provide high-resolution images on a cellular level.

### Market

The endoscopy market worldwide projection for 2011 is nearly \$24.8 billion, and this is anticipated to increase to \$33.7 billion by 2016 at a compound annual growth rate (CAGR) of 6.4%. The largest increases in revenue are projected to occur in the areas of; laparoscopy, arthroscopy, gastroenterology (GI) endoscopy, and ear, nose and throat (ENT) endoscopy.

Keywords: Volume Holographic Imaging System, Endoscope

## Advantages

Faster video and image acquisition than confocal microscopes or optical coherence tomography - no scanning required;

Simultaneous image acquisition from multiple object planes;

Can accommodate traditional and fluorescence modalities;

This device can capture 3-D information about an object at camera frame rates.

## Institution

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