

Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-68-1335 **Yi Wang***, Department of Mathematics, Fairmont State University, 1201 Locust Avenue, Fairmont, WV 26554, and **Ping He**. *An algorithm to reconstruct the 3-D surface structure of intact microvessels from their confocal images*. Preliminary report.

In this research a special algorithm is developed to reconstruct three dimensionally the surface structure of intact microvessels from live animals using their confocal images. The three dimensional reconstruction is obtained for the stack of images at different angles of rotation about a vertical axis. This allows the visualization of the lateral structures of the vessel. Stacks of confocal images were acquired from individually perfused intact venular microvessels of rat mesentery. A Leica TCS confocal system with an inverted microscope is employed for the data acquisition. The venular microvessels were perfused with the fluorescence labeled PECAM-1 antibody to generate the images. The proposed algorithm addresses two important issues: (1) the restoration of the decayed signals due to reduced laser intensity when the laser penetrates a biological sample; (2) reconstructing the surface structure of near half of the vessel by shading far half of the vessel for each angle of rotation. Hence the confounding overlap of the far surface images onto the near surface vessel wall is removed. This feature overcomes the limitations of the available commercial software. . (Received October 04, 2004)