

CONTROLLED LIGHT EXPOSURE MICROSCOPY, IMPLEMENTATION IN A POINT SCANNING MICROSCOPE.

Ron Hoebe^{1,2}, Carel van Oven² and Erik Manders¹

¹Centre for Advanced Microscopy (CAM), Swammerdam Institute for Life Sciences

²Department of Cell biology, Academic Medical Centre
University of Amsterdam

Meibergdreef 9, 1105 AZ, Amsterdam, The Netherlands

E-mail : R.A.Hoebe@amc.uva.nl

KEY WORDS: Living cells, photodamage, phototoxicity, photobleaching, CLEM, Confocal Microscopy

The major limiting factor in live-cell imaging is phototoxicity of light used for the observation of the cell. Controlled Light Exposure Microscopy (CLEM; patent pending) is a new concept of microscopy where phototoxicity is effectively reduced by controlling the laser intensity for the excitation of fluorophores. We have calculated the reduction of phototoxicity and investigated the properties of CLEM-images by computer simulations. These computer simulations show that CLEM can reduce the phototoxicity by a factor of 5-10 without serious image deterioration. In this presentation we will show the concept of CLEM, data from computer simulations as well as data from the first prototype of a CLEM-microscope.



Figure 1: CLEM Electronics prototype.