

## Image Solutions Helps Unlock The Molecular Secrets Of Memory

**A CARV II Confocal Imager from Image Solutions (UK) Limited is helping scientists at Royal Holloway, University of London to better understand how memory functions at the molecular level.**

For a number of years, Dr. Pavlos Alifragis and his team at the University's School of Biological Sciences have been investigating the molecular mechanisms responsible for generating different types of neurons within the cerebral cortex.

Unique to mammals, the cerebral cortex is responsible for all cognitive functions. To function properly, it requires the proper specification of a multitude of neurons that will, in turn, communicate with each other via an intricate network of specialised connections called synapses.

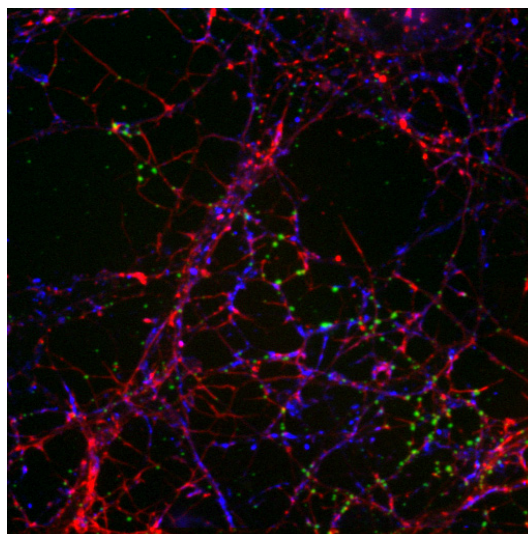
Recently, Dr Alifragis's work has expanded to include more about the dynamics of how Neuronal synapses function. "To find out details about the chemical and signalling events at neuronal synapses you need to be able to visualise them in fixed as well as live neurons. Hence the need for a high-quality imaging system" said. Dr. Alifragis.

The CARV II Confocal Imager from Preston-based Image Solutions offers high-speed, multi-point confocal scanning combined with a high quantum efficiency charge coupled device (CCD) cameras. This minimises photobleaching of fluorescent dyes used in imaging while allowing real-time imaging and recording at up to 100 frames per second. A long life arc source coupled to the instrument via an alignment free light guide allows for full spectrum (360-700nm) confocal imaging of virtually any fluorescent probe.

In the past, one of the primary problems faced by Dr. Alifragis and his team was the need to get the best fluorescent images possible while achieving the best spatial separation possible – for synapses that are typically just one micron across.

"An option here could be to use confocal laser scanning microscopy, which can be the best solution if resolution is critical. However, if the fluorescent staining is not intense enough or for imaging live neurons, bleaching from the laser can become a problem. Although I had never used CARV before, it is proving to be the best solution because it has the big advantage of providing adequate confocality without bleaching the samples, and is overall a bit faster than laser confocal in acquiring the image" added Dr Alifragis.

"It's not been easy to solve this particular problem. I did look at equipment from other suppliers, but Image Solutions were the only people who offered to leave their instrument for a long-term trial rather than a one-day demonstration. While it's a substantial investment, CARV is very low maintenance," he concluded.



*The image shows neuronal cultures, 14 DIV stained for NMDA receptor 1 (green), for F actin (with phalloidin rhodamin) and synaptophysin (cy5: blue).*