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Introduction of scientific papers utilizing Nikon Imaging Centers

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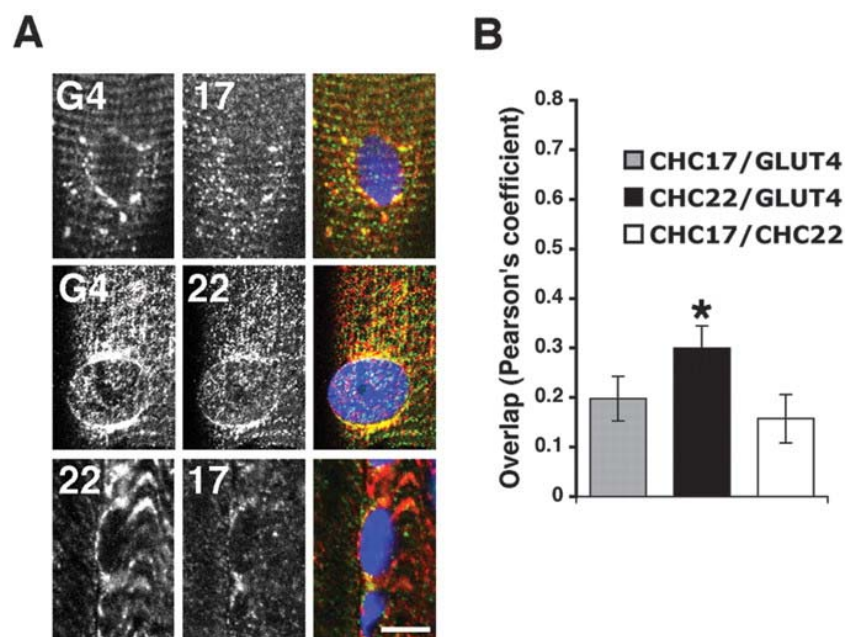
We find that more than 70 of new papers utilizing Nikon Imaging Centers around the world have been published in 2009. Many of them appeared in academic journals which are influential and high in impact factor. This commentary will talk about four papers which have been published in the scientific magazines, Nature and Science.

1. Stéphane Vassilopoulos et al (2009) Science vol. 324, pp. 1192 - 1196

A Role for the CHC22 Clathrin Heavy-Chain Isoform in Human Glucose Metabolism

Glucose transporter (GLUT) is known as the protein which is associated with cellular uptake of glucose. This paper shows that the protein called Clathrin CHC22 comes into play during the course of subcellular biosynthesis and trafficking to membrane of glucose transporter. It is suggested that abnormality in such subcellular trafficking is associated with development of diabetes.

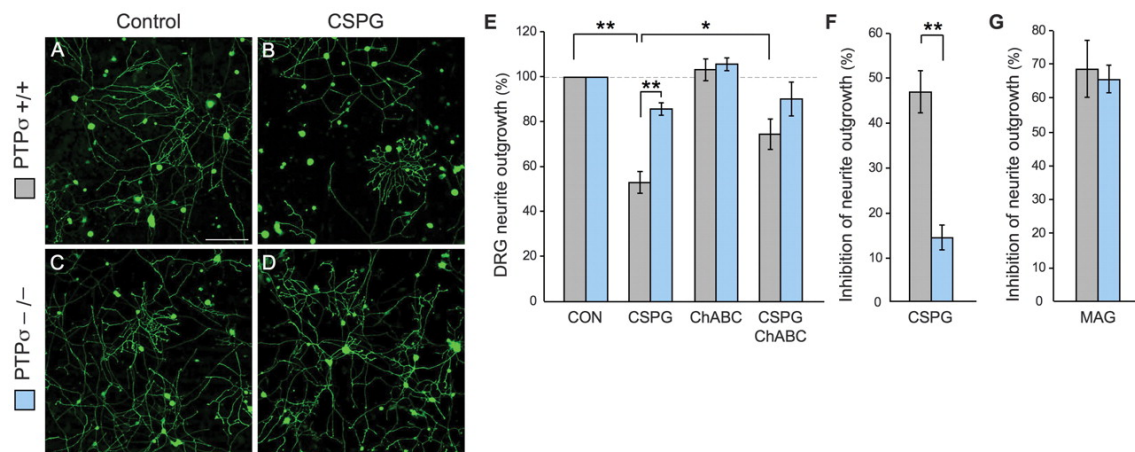
The below Fig. A and B show that colocalization of the glucose transporter (GLUT4) and the CHC22 within the cells is examined by immunofluorescence with the confocal microscope. The Nikon C1si confocal microscope at the Nikon Imaging Center in UCSF was used.



2. Yingjie Shen et al (2009) Science vol. 326, pp. 592 - 596

PTP Is a Receptor for Chondroitin Sulfate Proteoglycan, an Inhibitor of Neural Regeneration

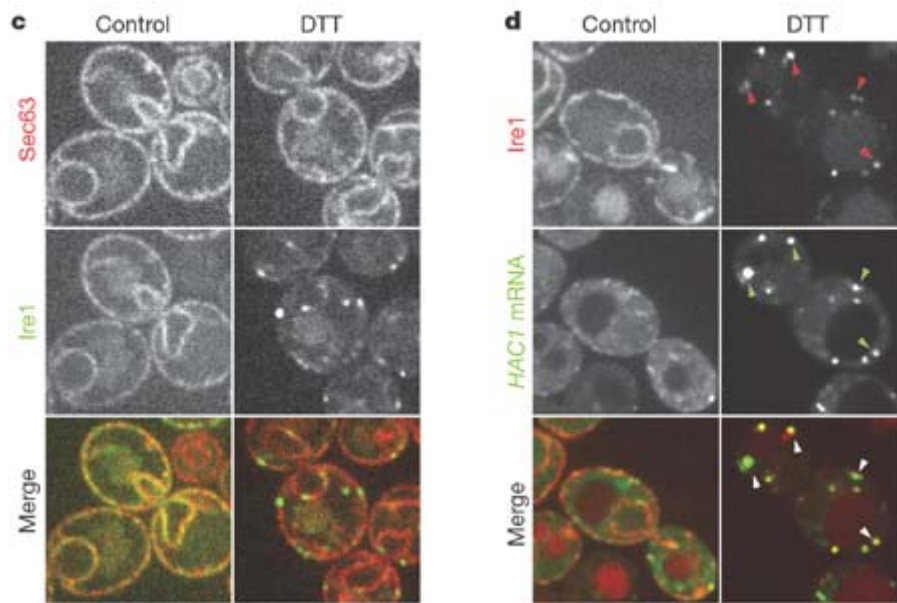
Chondroitin Sulfate Proteoglycan (CSPG) is one of glycoprotein which has sulfate group. CSPG is known as a protein which inhibits axon regeneration. This paper shows that the membranous enzyme named PTP σ can act as receptors for CSPG. It is expected that the results may lead to therapeutic development to enhance neural regeneration. Below figures, as appeared in the paper, show that the neurite outgrowth is quantified after CSPG is added to neuron of dorsal root ganglion (DRG) which has been primary-cultured. The fixed sample was imaged by immunofluorescence and Nikon Ti inverted microscope, and was analyzed by MetaMorph software. Nikon Imaging Center at Harvard Medical School was utilized.



3. Tomás Aragón et al (2009) Nature vol.457, pp.736-740

Messenger RNA targeting to endoplasmic reticulum stress signalling sites

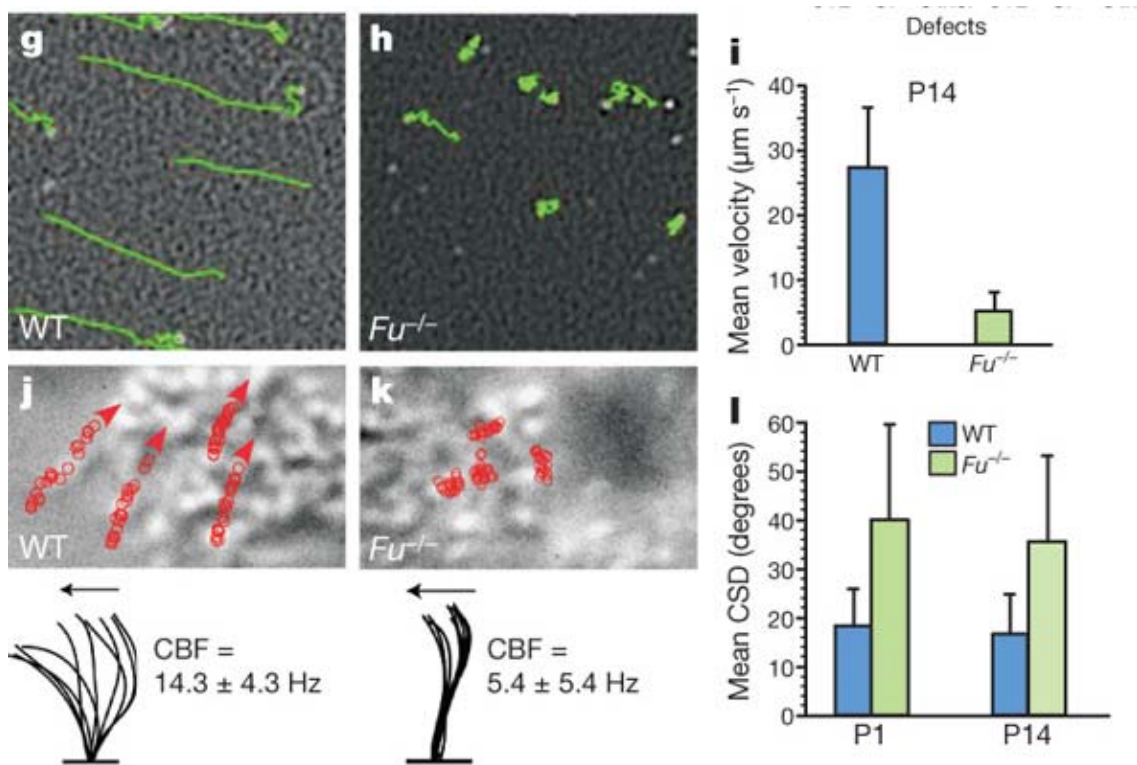
This paper introduces a new paradigm for the control of gene expression, associated with the unfolded protein response (UPR) of the endoplasmic reticulum (ER). Ire1 molecules, which is sensing the ER stress, upon activation, cluster in the ER membrane, to which mRNA is recruited. This progress is shown in the microscope images. Below figures show simultaneous observation of both mCherry-labeled Ire1 and GFP-labeled mRNA in yeast. The images under the word Control show the status before induction of ER stress, and the images under the word DTT show the status after induction of ER stress. Nikon TE2000 inverted microscope, CSU-22 spinning disk confocal, and Cascade II EMCCD camera were used for imaging. Nikon Imaging Center at UCSF.



4. Christopher W. Wilson et al (2009) Nature vol.459, pp.98-102

Fused has evolved divergent roles in vertebrate Hedgehog signalling and motile ciliogenesis

Hedgehog signalling pathway is known as the pathway adjusting the organ formation in the embryo. Abnormality of the pathway is subjected for various studies, as it is associated with not only abnormality at developmental stages developmental abnormality but also development of cancer. This article shows how a protein on the signalling pathway called Fused works in mammals. To explain the mechanism that Fused mutants alter the function of the central pair and thus the motion of cilia becomes abnormal, they used TE2000 with Perfect Focus System to directly capture the cilia and measured ciliary beat frequency and range of motion (Fig j and k). They also got images with Nikon E1000 of traces of fluorescent-bead movement over ciliated tracheal explants, to show that Fused mutants prevent the fluorescent-bead from moving smoothly (Fig g and h). The figures with the letters WT shows Fused non-mutants, and Fu ^{-/-} shows Fused mutants.



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