

IMEG Seminar Series

The road to global science

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Molecular physiology of pain: from calcium channels to brain circuits



This seminar series is open to all students and researchers in Kumamoto University.
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Chronic pain can be a debilitating condition for which there are currently few treatment options. Pain signals travel along specific nerve cells from the site of an injury to the spinal cord where they communicate with another set of nerve cells that connect to the brain where pain is perceived as an unpleasant sensation. During chronic pain states, there are persistent changes in peripheral and central nervous system neuronal circuits that process pain related information. Our laboratory has discovered a key mechanism by which dysregulation of voltage gated T-type calcium channels by deubiquitinase activity is important for aberrant pain signalling in inflammatory and neuropathic conditions, and we are developing novel pain therapies based on our findings. We are also striving to understand how brain connections are altered during neuropathic pain, and we accomplish this by using in vivo optogenetic and chemogenetics approaches, coupled with pain behavioral assessments to map how the brain processes pain related information. In my presentation, I will speak about these two lines of research in our laboratory.