Abstract of Presentation

Presentation Title:

Identification and Validation of Targets for Chronic Pain Treatment

Abstract :

According to a recent survey, almost 20% of the adult population in Western societies suffer from chronic pain. In almost 60%, pain lasts for more than two years and almost two thirds of the patients are unsatisfied by their analgesic treatment for either insufficient pain relief or intolerable side-effects.

Typical diseases underlying the development of such pain syndromes include chronic inflammatory diseases such as rheumatoid arthritis and nerve damage due to injury, infections or metabolic diseases. Plenty of evidence indicates that chronic pain of various origins is to a large extent due to plastic changes in the central nervous system, in particular in the spinal cord. As such, chronic pain is often refractory to treatment with classical analgesic drugs. Important new insights into the molecular basis of the underlying maladaptive neuroplasticity have been gained in recent years. Diminished inhibitory pain control by GABAergic and glycinergic neurons in the spinal dorsal horn is a major contributing factor in many forms of chronic pain.

Our research aims at the identification of drug targets, which would allow the prevention of such maladaptive processes or the reconstitution of proper synaptic inhibition in the spinal dorsal horn. We use cellular electrophysiology to study mechanisms of disinhibition in pain states and behavioral models employing genetically modified mice for target validation. Through such combined approaches we have identified molecular pathways leading to a loss of synaptic inhibition in inflammatory diseases. More recently, we could demonstrate that synaptic inhibition in the spinal cord can be restored with subtype-selective GABAergic ligands in animal models of inflammatory and neuropathic pain.