Chronic pain is defined as a pain lasting more than three months, and can be associated with an ongoing illness. It may have been triggered by an initial injury or may have no clear causes. With an estimated prevalence of up to 40%, chronic pain is regarded as a major health problem with direct and indirect economic costs estimated at 1.7-5% of the gross national product in western European countries. Chronic pain affects people's wellbeing, their ability to maintain an independent lifestyle, productivity and social relationships. Unsurprisingly, mental disorders, including mood and anxiety disorders, are strongly associated with chronic pain. Common examples include chronic lower back pain, post-traumatic pain, osteoarthritis, regional pain syndromes, fibromyalgia and chronic headaches. The mechanisms underlying chronic pain remain largely unknown, and in most cases there is no effective treatment.

Because of its complex and subjective nature, pain has received much attention from the neurosciences. With the development of neuroimaging methods, which allow the investigation of neural processes in vivo in the human brain, a large body of research explored how pain information is processed by the central nervous system. These studies identified a so-called ‘pain matrix’ in the brain, i.e. a network of brain regions processing pain information. If the ‘healthy’ pain processing has been largely investigated, there are far fewer neuroimaging studies investigating the neural processing of pain in chronic pain patients.

At neural level, chronic pain is characterised by abnormal sensitivity to painful stimuli in the brain and is associated with cellular changes. Our research group, which associates experts of several disciplines from the Universities of Fribourg, Bern and Zurich in Switzerland, investigated the role of the dopamine system in pain processing in fibromyalgia patients using neuroimaging methods. Fibromyalgia is a diffuse soft-tissue pain syndrome with unclear pathophysiology that is characterised by strong functional impairment. Because little is known on the causes of fibromyalgia, and because this condition is often accompanied by depressive symptoms, patients are often not taken seriously (“it’s in your head”) and there is also no efficient treatment for fibromyalgia. It is therefore crucial to understand the underlying processes of fibromyalgia using research methods going beyond the subjective pain reports of the patients. Our results evidenced a disruption of the dopaminergic neurotransmission that was associated with changes in the perception of pain in fibromyalgia. Moreover, differences were found between patients with and without depression. Together with results from other research groups, our findings indicate that they are specific neural changes in fibromyalgia and therefore that the pain reported by these patients might well be located ‘in their head’.

This example shows how clinical neurosciences, i.e. the application of neuroscientific methods to clinical populations, can help understand chronic pain conditions and therefore ameliorate the care and the ‘image’ of these patients. Furthermore, findings from clinical studies in neurosciences can support the development of new, innovative and personalised treatment, which in turn may have a beneficial impact on the economic costs associated with chronic pain conditions in the long term. Whilst we were lucky enough to receive funding for the Swiss Scientific National Foundation for our research, it is more difficult in general to get funding for clinical studies in the field of neurosciences, because patients’ samples are often inhomogeneous and difficult to compare with healthy participants. Even if basic research in neurosciences is important in understanding basic neural mechanisms and allows advances in technology, clinical research is just as important and has direct implication for the health systems and the societal costs related to medical and or mental conditions.