Pain therapy is still challenging. Current drugs have strong therapy-limiting side effects and often provide only unsatisfactory pain relief. Novel therapeutic targets are urgently needed. Much research has focussed on small sized mediators of pain sensitization (prostaglandins, neuropeptides, growth factors...) (Hucho and Levine, 2007). The large proteins of the extracellular matrix (ECM) are mostly unexplored. This is surprising as painful insults such as tissue injury strongly affect the ECM. In turn, the ECM potently modulates inflammation, growth factor signalling, and outgrowth, all of which also affect pain. I was involved in the first proof that the ECM regulates pain sensitivity. And at the UniKöl, there is great expertise in skin/ECM processes ranging from its biochemistry to transgenic models. A cellular screen and analysis for the identification of ECM modulators of pain is missing.

My group established a unique High Content Screening (HCS) microscopy approach for cellular pain research. Thus, using the ECM-expertise, the large numbers of pure ECM proteins available on the campus, and our HCS-microscopy cellular pain approach we will 1) screen for ECM proteins affecting nociceptive neurons, 2) establish signalling pathways and neuronal subgroup specificity, 3) responsiveness to opioids, and 4) the relevance for pain in the animal. Where possible, results will spur translational human experiments.

Literature


