

Novel Biomarkers and Pain Phenotypes in Trigeminal Neuralgia

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Trigeminal neuralgia is a chronic, debilitating disorder characterized by repeated episodes of intense facial pain. It is frequently refractory to medications, and patients who fail noninvasive therapies often consider a neurosurgery known as microvascular decompression. However, the surgery is not without risk of serious complications, and pain relief is not guaranteed. This project will study novel biomarkers, such as cytokines and microRNAs, and evaluate objective patient pain profiles to investigate the mechanisms of trigeminal neuralgia and predict which patients will be most likely to benefit from surgical treatment. We aim to translate laboratory findings into real-world outcomes of changes in pain perception and microvascular decompression success, providing a deeper understanding of trigeminal neuralgia and suggesting potential new therapies. These approaches could also be applied to other types of neuropathic (nerve-related) pain conditions, guiding new paradigms to explore the mechanisms of chronic pain and develop novel precision pain medicine treatments.