

Title: Molecular Characterization of Parabrachial Nucleus after Opioid Exposure and Withdrawal

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Abstract: Opioid exposure leads to alterations in neural circuits that have been implicated in dependence and withdrawal. By improving our understanding of opioid and withdrawal induced molecular adaptations, we move towards discovering better treatments for opioid substance use disorder and opioid withdrawal. A brain region implicated in aversive sensory processing is the parabrachial nucleus (PBN). Mice were separated into five groups representing a spectrum from saline to naloxone precipitated withdrawal, with PBN tissue collected following 5 days of daily injections. PBN tissue was sent for bulk RNAseq and differential expression analysis, gene ontology analysis, and rank-rank hypergeometric overlap analysis were performed. Overall, analysis showed varying number of differentially expressed genes across all groups, as well as specific genetic overlap between certain groups in males or females. Gene ontology analysis revealed changes in specific ion channels as well as changes to genes involved in cellular architecture. These findings provide insights into molecular changes broadly in the PBN, a region important for relaying aversive somatosensory information, and may contribute to a better understanding of how opioid exposure and withdrawal affect the PBN.