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CPAP, Piezo Channels, and Neonatal Airway Disease

Abstract

Babies who are born prematurely and require oxygen or continuous positive airway pressure (CPAP) therapy are at greater risk of developing asthma later in life. There is a critical gap in understanding how these early insults lead to sustained changes in the developing airway. Prior studies in mice have shown that CPAP exposure increases airway reactivity and causes airway wall thickening, both of which are features of asthma. The mechanisms by which CPAP results in these changes are unknown. CPAP causes increased stretch on the airway and lung. We therefore hypothesize that stretch-sensitive Piezo (PZ) channels in the developing airway are activated by CPAP stretch and contribute to CPAP-induced airway changes. In this study, we will investigate the contribution of PZ channels in developing airway contractility and remodeling in the context of stretch. Our aim is to better understand the mechanisms underlying diseases of prematurity with a goal of finding molecular pathways that could be new therapeutic targets for children with asthma.