

**Absence of Corticothalamic Connection in “Cortexless Mice” Affects  
the Development of Visual Circuit**

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The visual circuit in mice is organized into two major parallel pathways: axons from the eye projects to both superior colliculus (SC) and lateral geniculate nucleus (LGN), which then projects to primary visual cortex (V1). Meanwhile, LGN and SC receive corticothalamic and corticocolliculi feedback projections from layer 5 and 6 of V1. Due to the complexity of cortical circuitry, functions of these feedback projections are not well understood. In this study, we utilized Tra2b<sup>fl</sup>; Emx1-Cre mouse, a “cortexless” mouse, to study the role of cortical feedback connections in the development and function of visual circuit. All retinofugal projections were normal in Tra2b mouse with the exception of dLGN. Neither contralateral nor ipsilateral retinothalamic axons existed in dLGN. However, eye-specific segregation in vLGN and SC remained normal. Our results demonstrated that corticothalamic feedback projections affected the wiring of visual circuits. We also used *in vivo* 2-photon calcium imaging to study the direction selectivity of SC in the absence of V1. Results will be discussed in detail at the workshop.