Lay summary: Immune-mediated sensory impairments drive social and communication disorders in Christianson syndrome

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Christianson syndrome (CS) is a neurodevelopmental disorder in which children display intellectual disability, autistic features and sensory abnormalities such as elevated tolerance to pain and aversion to touch. The proper maturation of these two sensory functions occurs in the spinal cord in the first weeks after birth. We hypothesize that in children with Christianson syndrome, abhorrent activity in spinal cord immune cells prevents the maturation of touch and pain pathways, leading to elevated pain tolerance and an aversion to touch. Furthermore, we posit that the touch aversion observed in developing CS infants will later impair the proper maturation of cortical circuits involved in social and communication function. Our project will examine how these neuro-immune interactions impact spinal cord development and whether they can be reversed by gene complementation.