Longitudinal characterization of the *CLN3$^{\Delta 7/8}$* miniswine model shows robust cellular pathology and behavioral deficits

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Mouse models for CLN3 Batten disease have improved our understanding of CLN3 biology and therapeutics through their ease of use and a consistent display of cellular pathology. However, these models have inconsistent, subtle behavior deficits that can be difficult to detect, which hinders the full understanding of CLN3 dysfunction and comprehensive testing of therapeutics. Additionally, the translatability of murine models is limited by disparities in CNS anatomy (e.g. lissencephalic cortex), body size, and life span. Previously we presented our initial characterization of a novel miniswine model of CLN3 disease. Here, we present updated cellular and behavioral phenotyping of the *CLN3$^{\Delta 7/8}$* pig through 4 years of age. Progressive pathology and neuron loss is observed in various regions of the brain and retina throughout early life, with ATP synthase subunit c accumulation detected in several brain regions as early as 1 day of age. *CLN3$^{\Delta 7/8}$* pigs show functional vision impairment and gait abnormalities that progressively worsen, and we discuss future directions for characterizing visual impairment more in depth. Taken together, the *CLN3$^{\Delta 7/8}$* pig model shows consistent and progressive Batten disease pathology and behavioral impairment, demonstrating its value in studying the role of CLN3 and the efficacy of various therapeutics in an animal model with physiology more similar to human patients.