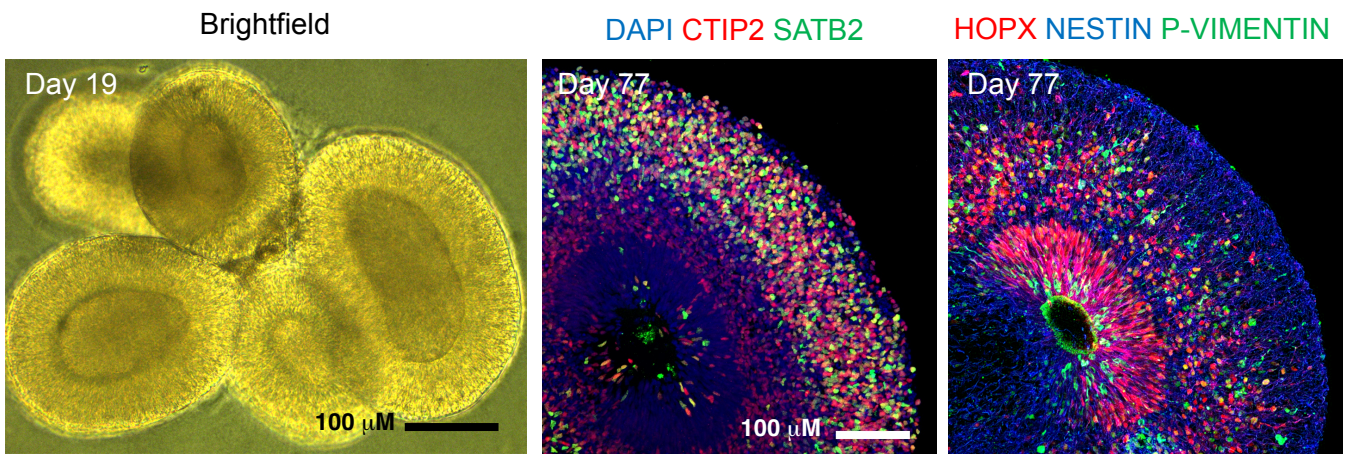
Brain Organoids

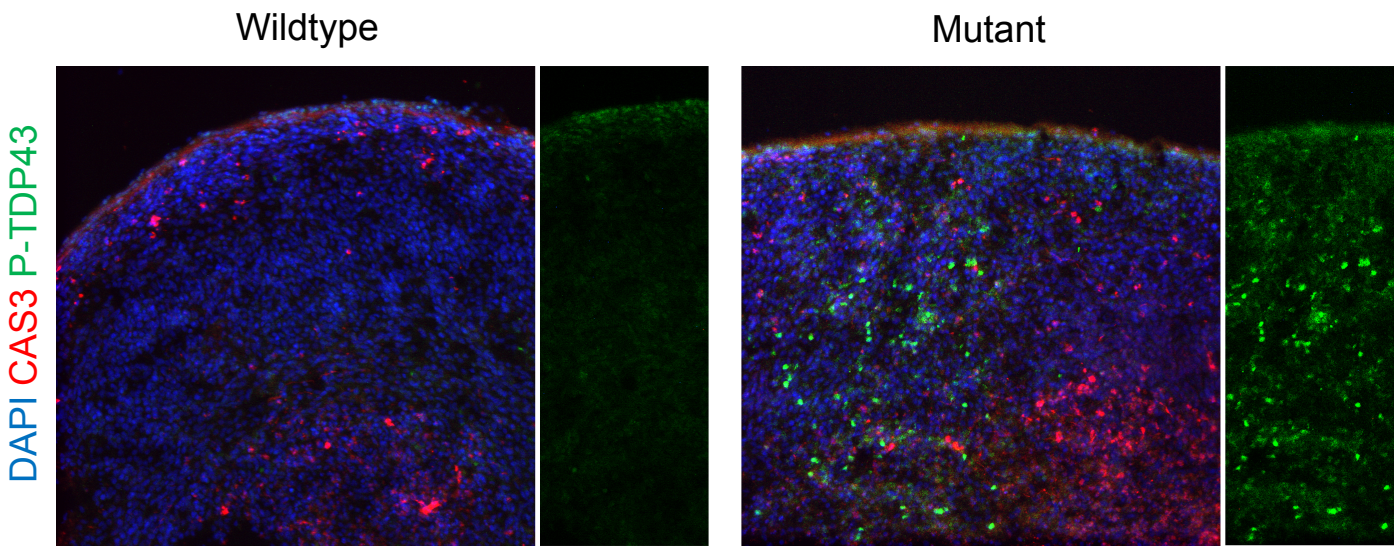
Human pluripotent stem cells can be directed to differentiate into all cell types and organ-like (organoid) tissues in the body. These three-dimensional (3D) organoids are more genetically and physiologically similar to endogenous human tissues than cells grown on monolayer or animals. Therefore, 3D organoids may serve as an alternative model to study disease mechanism, to perform drug/toxicity screening, and to validate specific hits obtained from a high throughput screen. Indeed, brain organoids have been successfully tested in separate studies of ZIKA and COVID infections and validations of drug hits. Additionally, organoids may one day provide a renewable source of cells for regenerative medicine and cell-based therapeutics.

Forebrain Organoids

Descriptions: Generation of forebrain organoids takes around 80-100 days. They express cortical markers such as CTIP2, HOPX, and SATB2. Mature forebrain organoids are electrophysiologically active and contain astrocytes and oligodendrocytes.



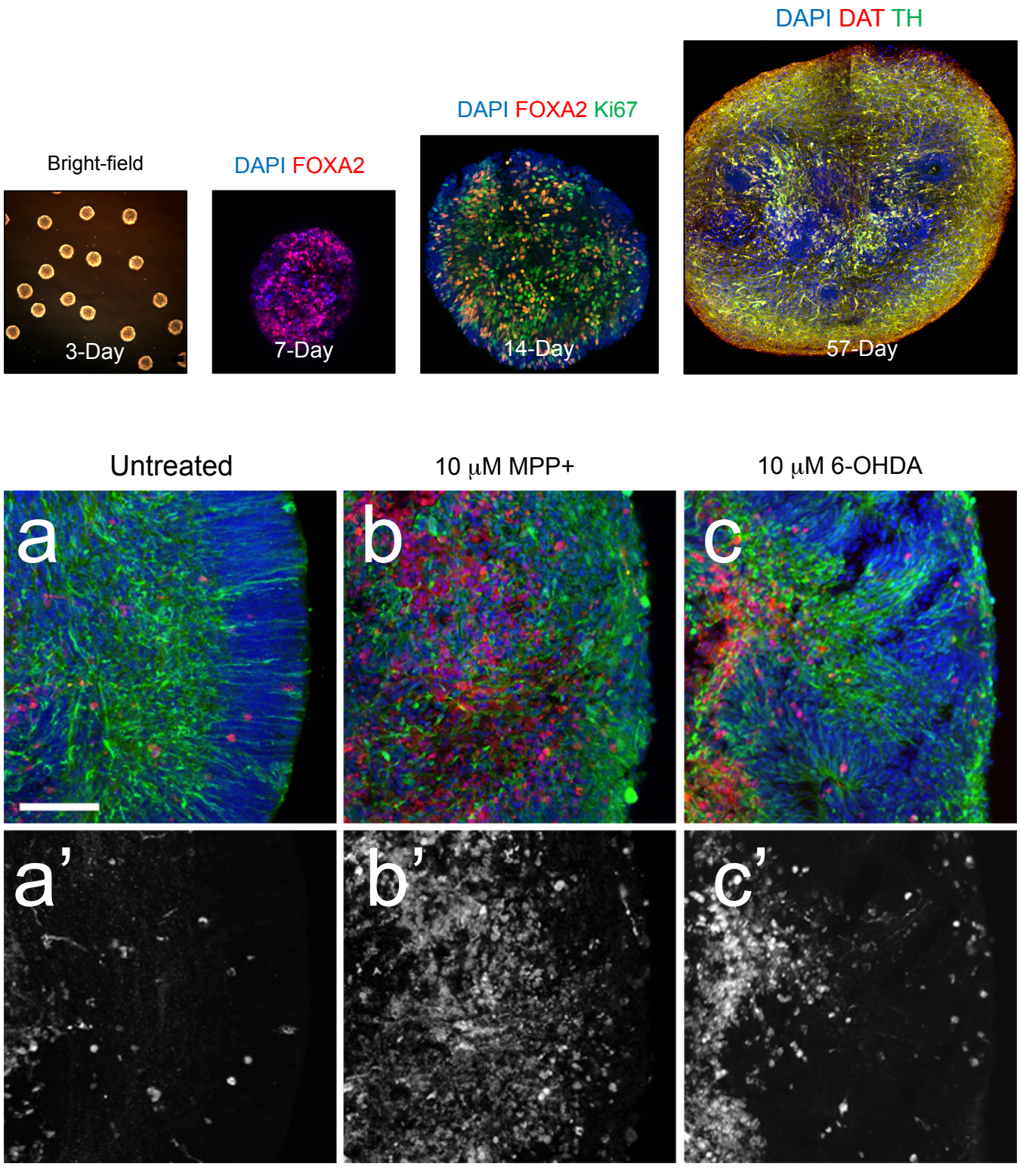
Early forebrain organoids develop into neural tube-like structure and later differentiate into structured and multi-layered cortical brain.



Forebrain organoids derived from a patient with neurodegenerative disease show increased P-TDP43 and CAS3 expression.

Midbrain Organoids

Descriptions: It takes 50-70 days to differentiate iPSCs into midbrain organoids Midbrain organoids express FOXA2 and Tyrosine Hydroxylase (TH) protein markers.



Induction of neurodegeneration in a model of Parkinson's disease in midbrain organoids

Contact us for more information about our brain organoids and services

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