Deciphering synaptic defect in psychiatric disorders using machine learning for drug screening applications.

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DISC1 coding

sequence:

5'UTR-ex1

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DISC1 as a trigger to model psychiatric disorders in iPSC-derived neurons

Automated workflow for multi-parametric phenotypic profiling



Synaptic staining panel in isogenic iPSC-derived neurons **Feature extraction** Segmentation of Map2 (network complexity)

Examples of single extracted neuronal features		
<u>SV2a per nuclei</u>	<u>Homer per nuclei</u>	Synapses per nuclei
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Machine Learning (ML) strategy to classify neurons based on multiple image-derived features

Classification of pharmacological modulation by multiparametric fingerprinting



Highlights

- Impaired synaptic phenotypes are recapitulated in DISC1 iPSC-derived neurons
- Assay automation and adaption to 384-well plates
- Machine learning classifies neuronal genotypes based on image-extracted features
- Machine learning identifies drug showing pharmacological rescue in neurons

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