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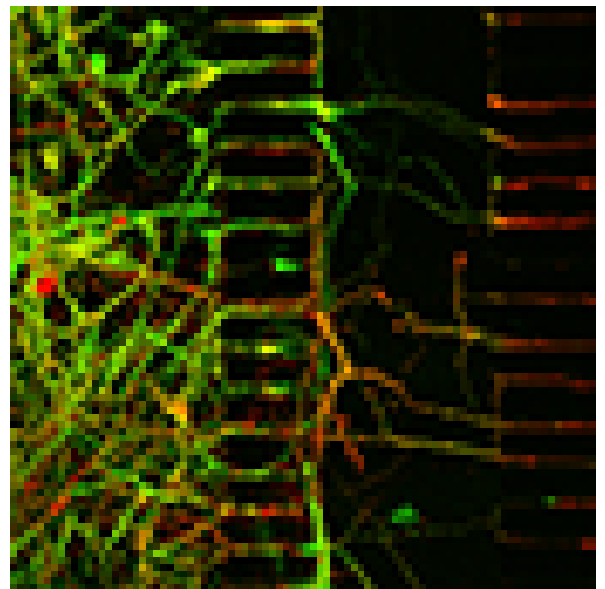
Reconstituting Corticostriatal Network on-a-Chip Reveals the Contribution of the Presynaptic Compartment to Huntington's Disease.

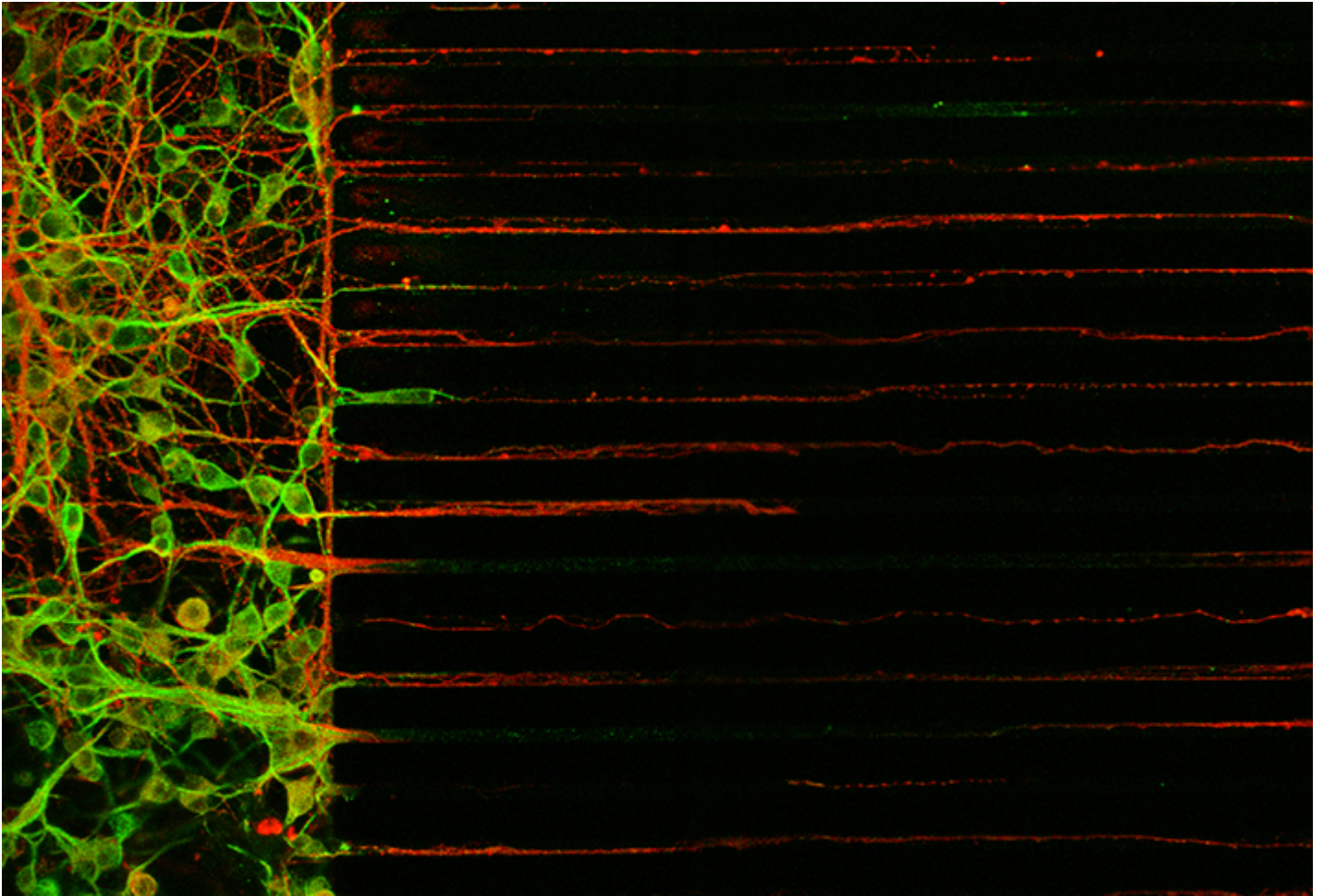
on the January 3, 2018

Huntington's disease (HD), a devastating neurodegenerative disorder, strongly affects the corticostriatal network, but the contribution of pre- and postsynaptic neurons in the first phases of disease is unclear due to difficulties performing early subcellular investigations in vivo. Here, we have developed an on-a-chip approach to reconstitute an HD corticostriatal network in vitro, using microfluidic devices compatible with subcellular resolution.

We observed major defects in the different compartments of the corticostriatal circuit, from presynaptic dynamics to synaptic structure and transmission and to postsynaptic traffic and signaling, that correlate with altered global synchrony of the network.

Importantly, the genetic status of the presynaptic compartment was necessary and sufficient to alter or restore the circuit. This highlights an important weight for the presynaptic compartment in HD that has to be considered for future therapies. This disease-on-a-chip microfluidic platform is thus a physiologically relevant in vitro system for investigating pathogenic mechanisms and for identifying drugs.





Reference :

Virlogeux A, Moutaux E, Christaller W, Genoux A, Bruyère J, Fino E, Charlot B, Cazorla M, Saudou F. [Reconstituting Corticostriatal Network On-a-Chip Reveals the Contribution of the Presynaptic Compartment to Huntington's Disease](#). Cell Rep. 2018 Jan 2;22(1):110-122. doi: 10.1016/j.celrep.2017.12.013.

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