



cellF

Guy Ben-Ary

Nathan Thompson

Andrew Fitch

Darren Moore

Mike Edel

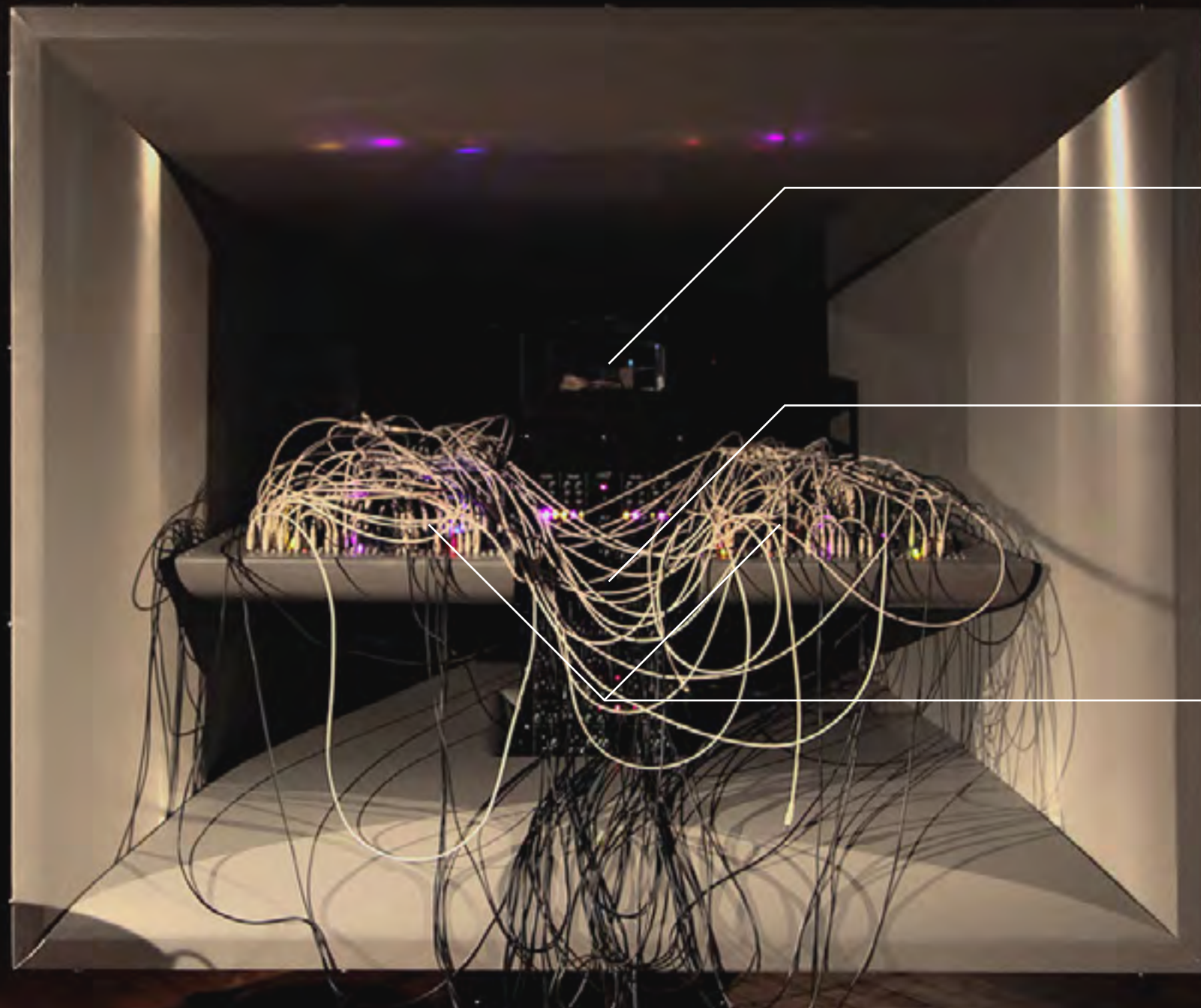
Stuart Hodgetts

Douglas Bakkum

Neural Network Prototypes, Differentiation
of Guy Ben-Ary's Neural Stem cells to neurons.



cellF is the world's first neural synthesizer.



Guy Ben-Ary's living neural network grows (and performs) over a specialised interface (MEA) inside a tissue culture incubator.

Neural interface that controls:

- 1) The Input by sending human-generated music (as electrical stimulations) to the neurons.
- 2) The Output by amplifying the neural signals and routing them to the synthesisers.

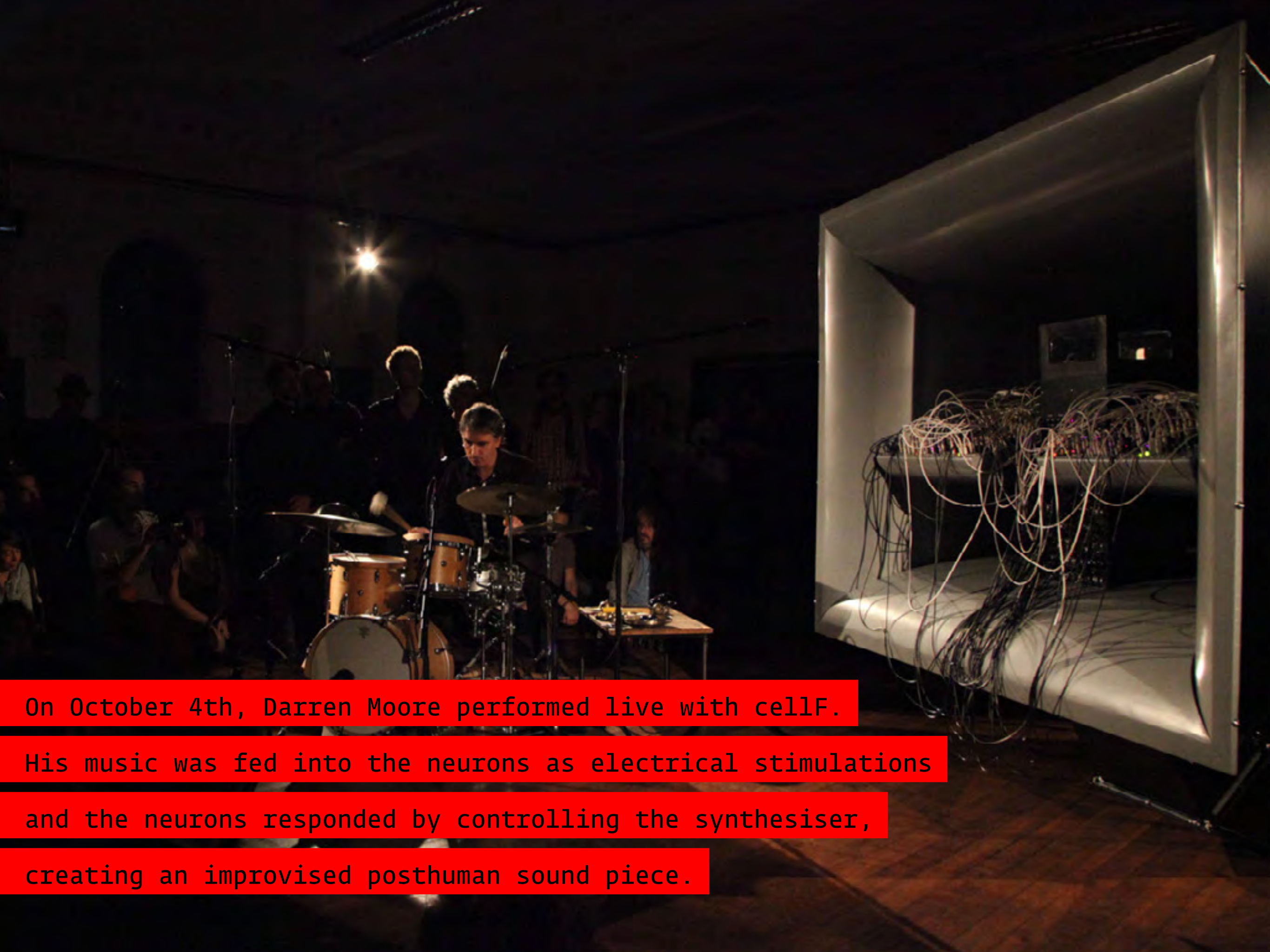
Custom-built modules:

- 1) cellF Synthesisers
- 2) Matrix Mixer, sound spatialisation modules.
- 3) "Frigate" stimulation controller.

Composed solely of Guy Ben-Ary's living neurons that control an array of analogue modular synthesisers, cellF is a completely autonomous analogue instrument.



There is no programming and no computers. cellF
is made just from biological matter and analogue
circuits; it is a 'wet-alogue' instrument.



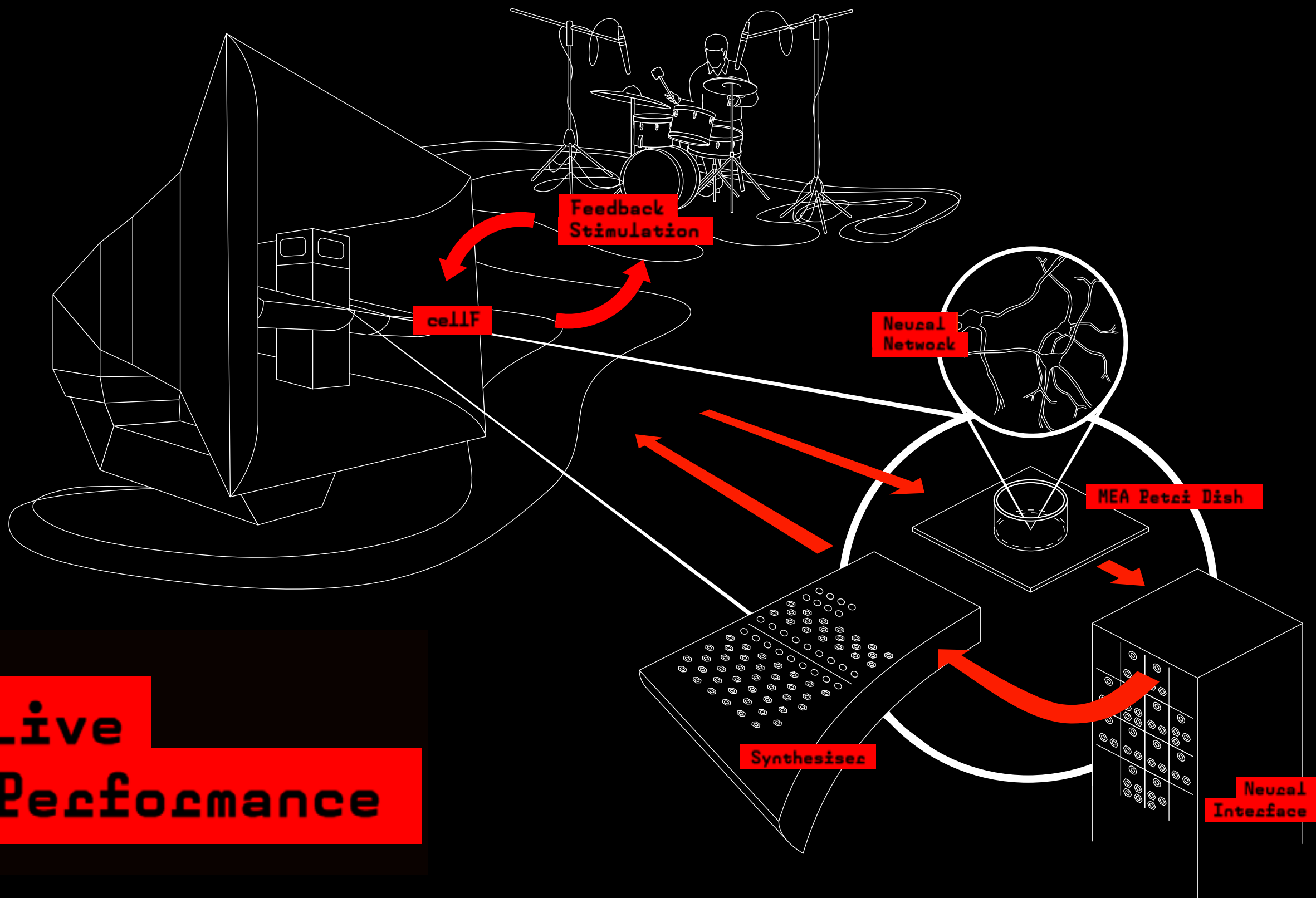
On October 4th, Darren Moore performed live with cellF.

His music was fed into the neurons as electrical stimulations and the neurons responded by controlling the synthesiser, creating an improvised posthuman sound piece.



cellF is the result of four-year of research and development to create a real-time interface between human musicians and living cells that have been altered through biotechnology.

Live Performance





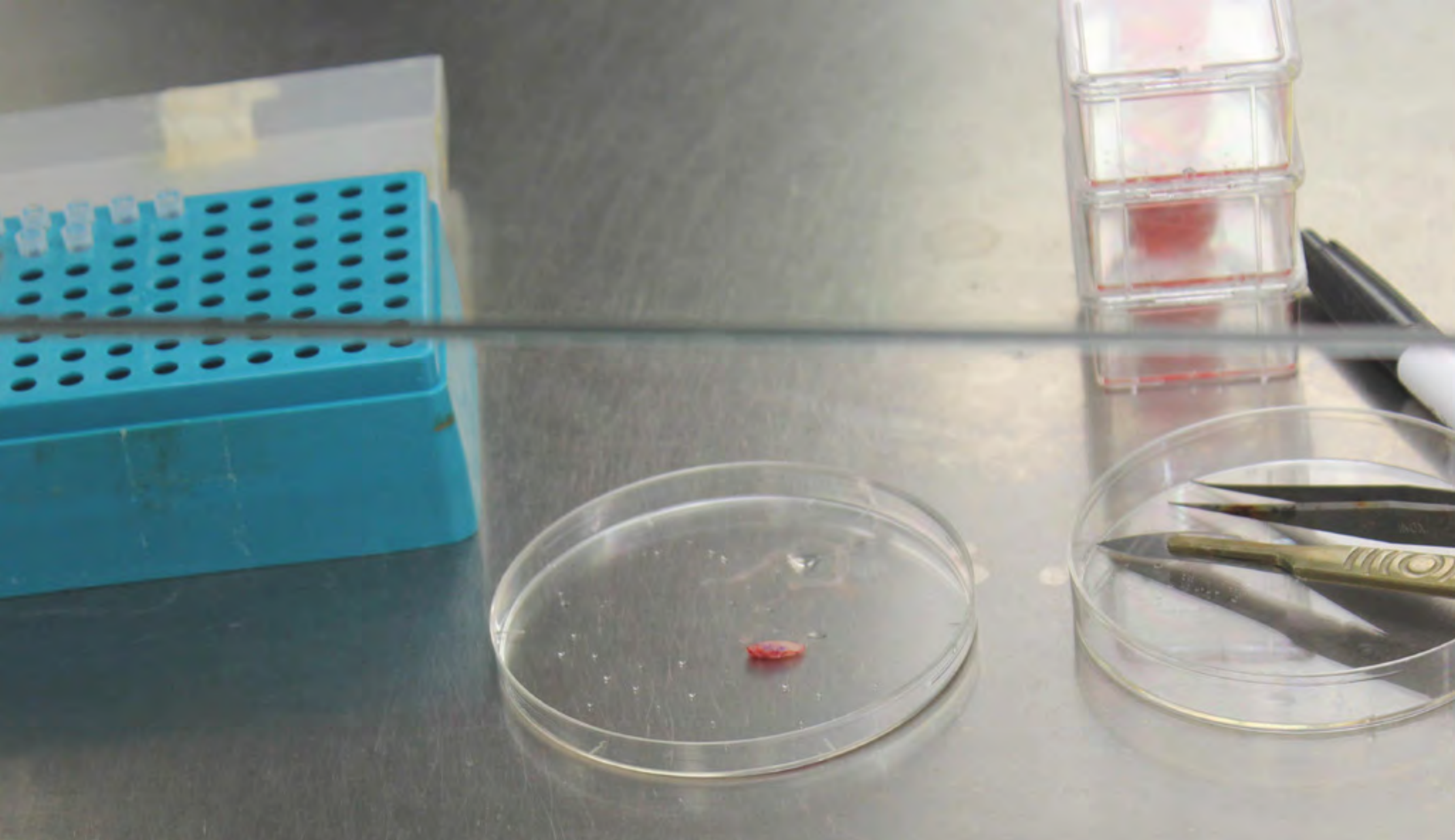
The Process



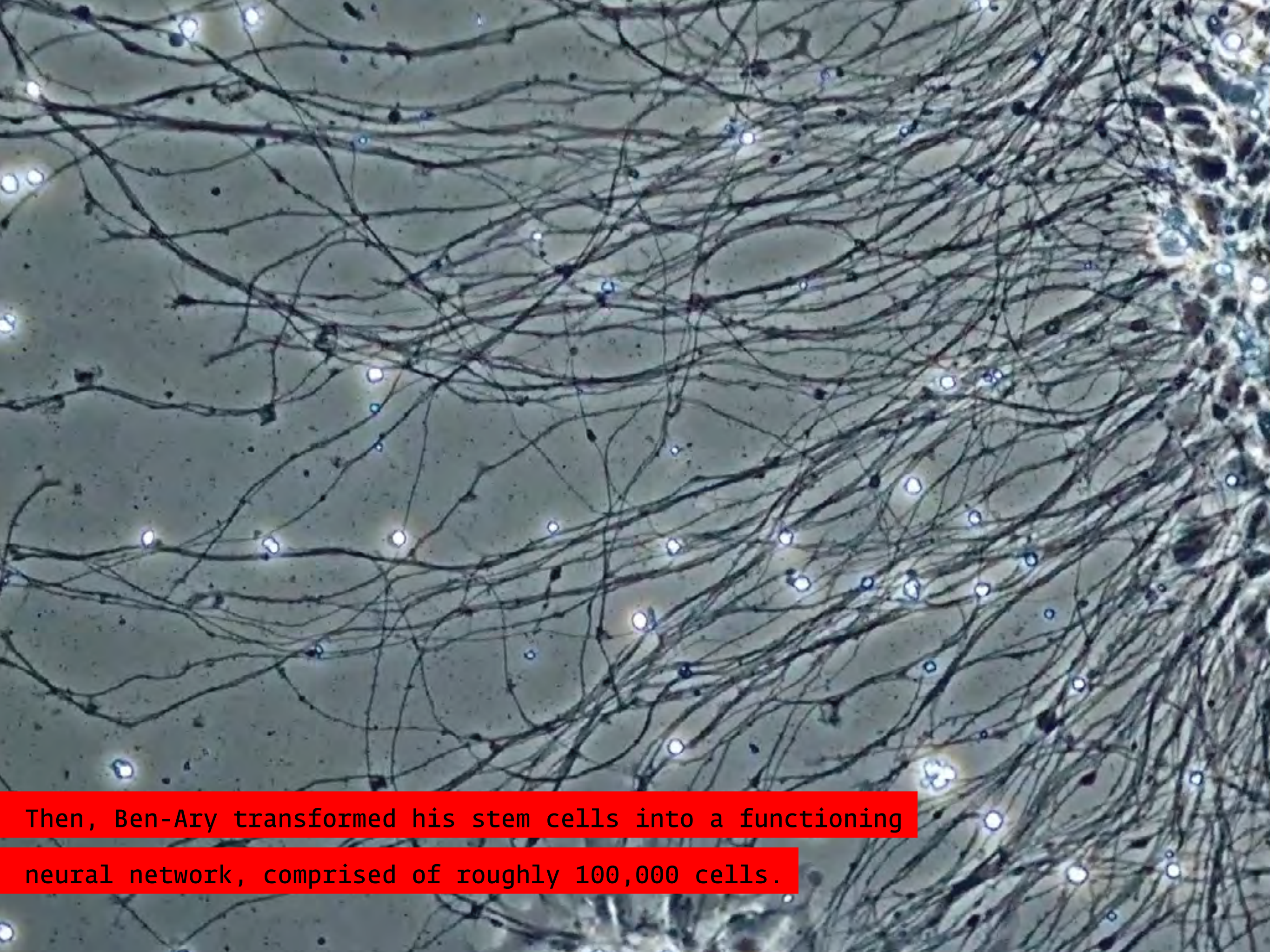
In 2012, Guy Ben-Ary received a fellowship to develop a biological self-portrait, and decided to portray one of his juvenile dreams: to become a rock star. To do this, he bioengineered his own 'external brain' to control modular synthesisers.



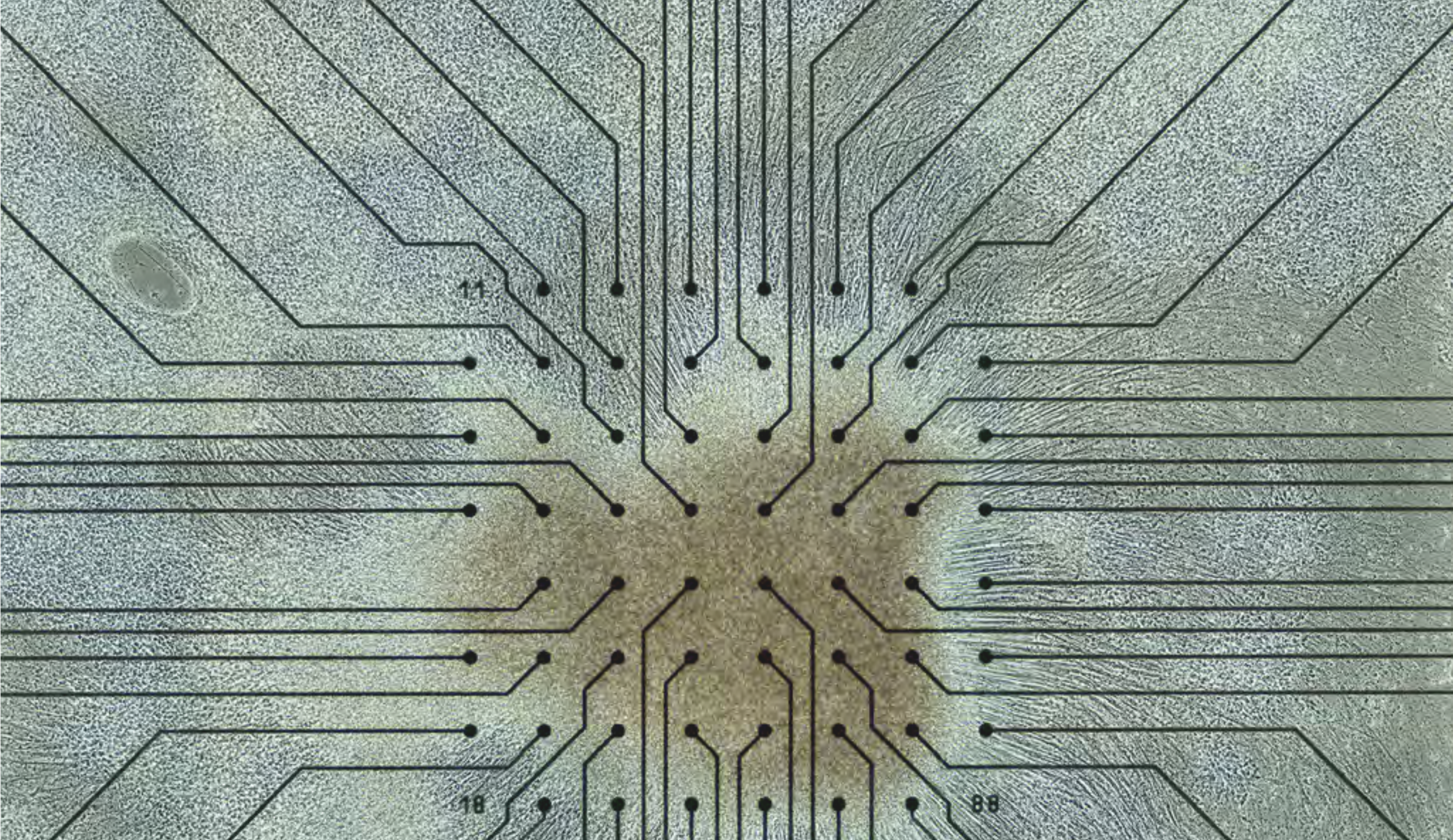
First, Ben-Ary harvested his own skin cells by taking a biopsy from his wrist. This tissue provided the basic living material to grow his 'external brain.'



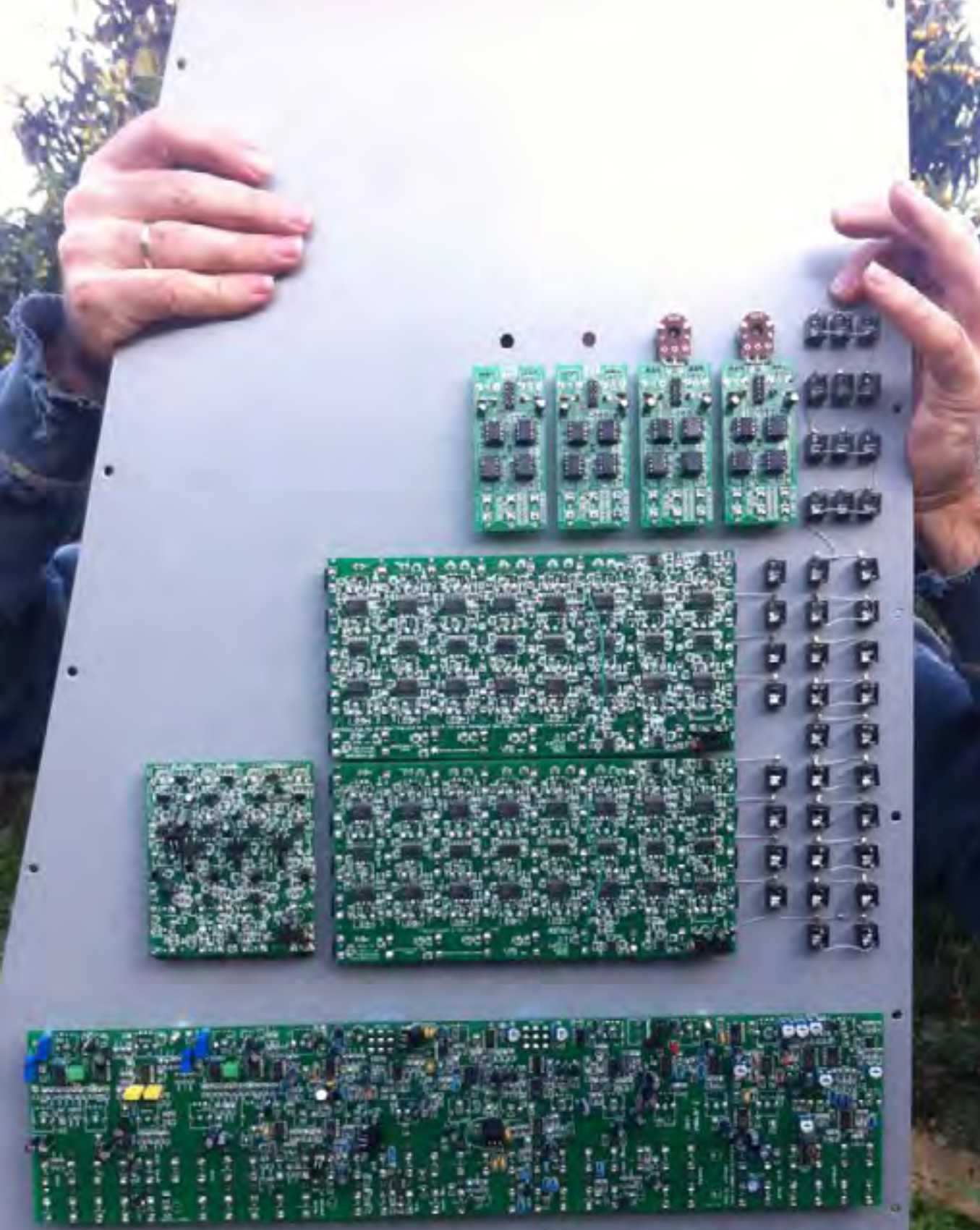
Next, he cultivated his tissue and, using cutting-edge stem cell technologies, he transformed his skin cells into stem cells.



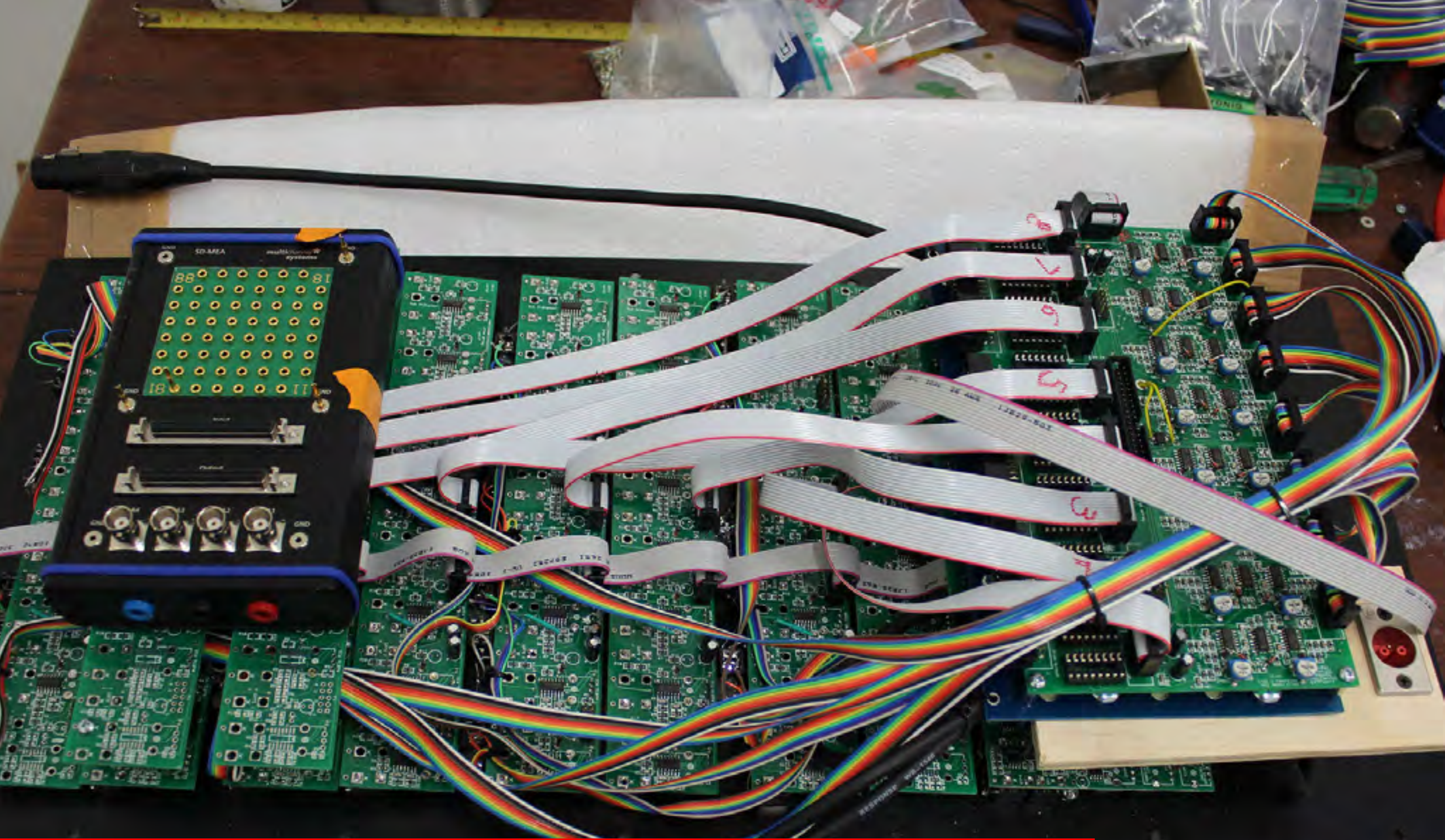
Then, Ben-Ary transformed his stem cells into a functioning neural network, comprised of roughly 100,000 cells.



The neural network was grown over an MEA, a petri dish consisting of 60 electrodes, which can record neural signals and send stimulations back to the neurons; functioning as a read-and-write interface to Guy's external 'brain'.



The neural networks were given a sound-producing body by connecting the MEA to a signal amplifier and a custom-built analogue synthesiser.



The in-built matrix mixer spatialised the sound to 16 speakers to reflect the neural activity on the MEA. Walking in the space during a performance is like walking inside the 'brain'.



The neural interface is the heart of the entity. It enables 'communication' between the human performer and the neural network by controlling the input stimulations (human-generated sound) and the output signal (neural activity).



**For more info, visit
guybenady.com**