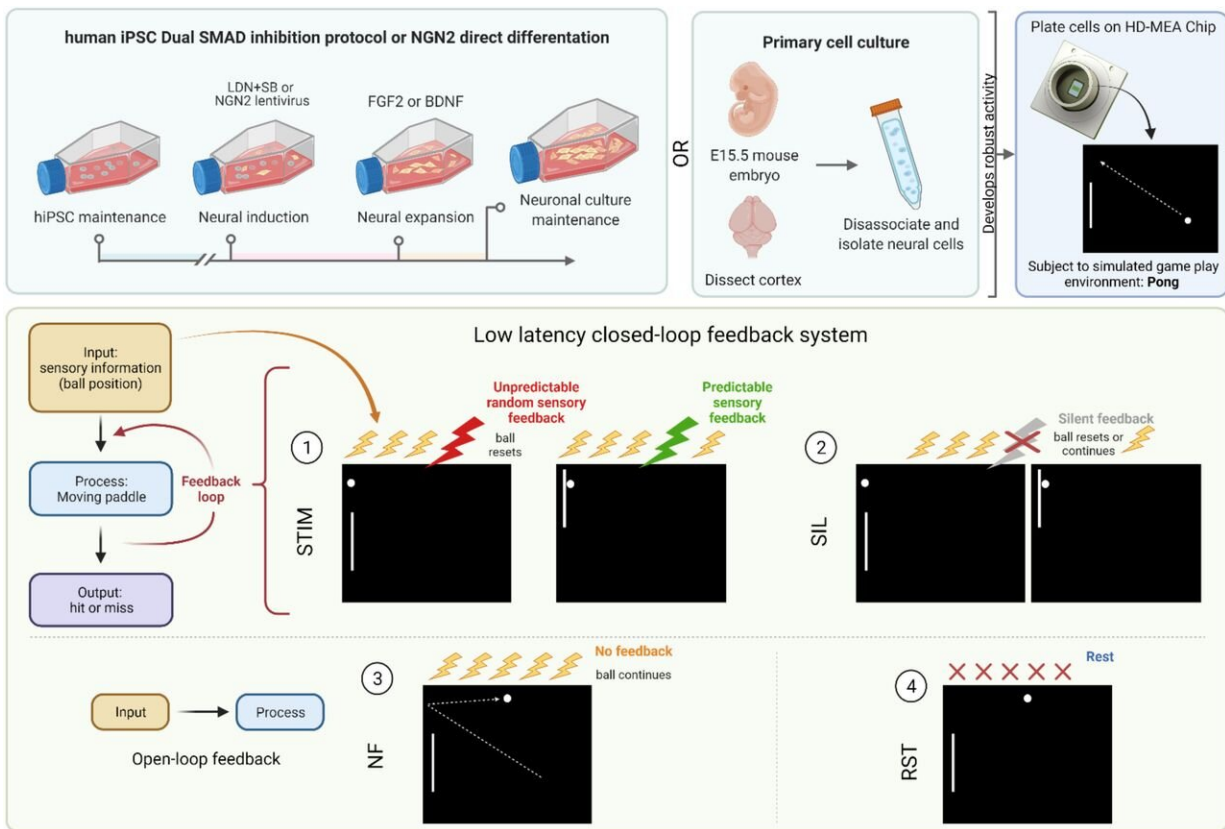


A mass of human brain cells in a petri dish has been taught to play Pong

December 20 2021, by Bob Yirka



DishBrain system and experimental protocol schematic. Credit: *biorxiv* (2021). DOI: 10.1101/2021.12.02.471005

A team of researchers affiliated with several institutions in Australia and the U.K. has taught a small mass of human brain cells to play the video

game Pong. Their paper is available on the bioRxiv preprint server.

Pong is a first-generation video game. The single-player version consists of a [paddle](#) and a ball. The player moves the paddle into the path of the ball to keep it in play as it bounces off of it, like a paddle in a real ping-pong match. In this new effort, the researchers taught a small mass of connected human [brain cells](#) to play the game.

The mass, which the researchers call a cyborg, was created by placing [human stem cells](#) on top of a micro-electric array, where they grew into brain [cells](#). In their configuration, the cells can both stimulate other cells and read the activity of others around them. Electrical signals are sent to the array to tell them where the ball is located. If electrodes to the right of a cluster fire, for example, the brain cells know that the ball is to their left. The distance of the signal gives the cells information regarding frequency. As with real Pong, the paddle can only move left and right. And also like the real game, the goal is to move the paddle into the path of the ball.

The cyborg was taught to play the game in the same way as are humans—by playing the game repeatedly to learn how to move the paddle in ways that result in success. In this case, it was feedback in the form of [electrical signals](#) in the electrodes.

The researchers found that the system was able to learn how to play the [game](#) in about five minutes—significantly faster than artificial intelligence machines. They note that the skill level of the system was far lower than for humans or AI systems, however.

The researchers suggest their work could lead to improvements in the design of machine learning systems or use in other applications such as testing therapies targeting the brain.

More information: Brett J. Kagan et al, In vitro neurons learn and exhibit sentience when embodied in a simulated game-world, *bioRxiv* (2021). [DOI: 10.1101/2021.12.02.471005](https://doi.org/10.1101/2021.12.02.471005)

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