

# Musk shows off progress on brain-machine interface

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Elon Musk has warned of the dangers of AI outpacing humans

Futurist entrepreneur Elon Musk late Tuesday revealed his secretive Neuralink startup is making progress on an interface linking brains with computers, and said they hope to begin testing on people next year.

Musk has long contended that a neural lace meshing minds with

machines is vital if people are going to avoid being so outpaced by [artificial intelligence](#) that, under the best of circumstances, humans would be akin to "house cats."

Musk and members of the Neuralink team laid out progress they have made on their mission at an event held in San Francisco to recruit talent in software, robotics, neuroscience and more.

"Ultimately, we can do a full brain-machine interface," Musk said.

"Achieve a sort of symbiosis with artificial intelligence."

Neuralink unveiled an early version of a tiny sensor with hair-thin strands that could be implanted in a brain through a small incision by a robot built for the high-precision task.

"They are tiny electrodes and the robot is delicately implanting them," Musk said, noting there could be thousands of the electrodes connected to a brain.

"This is something that is not going to be stressful to put in; will work well, and it is wireless."

The chip will communicate wirelessly with an earpiece, which relays information to a smartphone application, according to Neuralink.

For now, the goal is to let a person with the implants control a smartphone with thought, but the technology could eventually extend to other devices such as robotic arms.

"This has tremendous potential," Musk said.

"We hope to have this in a human patient before the end of next year."

An early focus of the team is using the technology to address brain diseases and paralysis, but the longer aim is to make implants so safe, reliable and easy that they could be elective surgery options for people seeking to enhance their brains with computing power, according to a neurosurgeon on the Neuralink team.

Musk said the goal was to make adding the brain-enhancing implants as easy a procedure as laser eye surgery.

"I've said a lot about AI over the years; I think that even in a benign scenario, we will be left behind," Musk said.

"With a high bandwidth [brain](#)-machine interface we can actually go for the ride and have the option of merging with AI. This is very important."

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