Neural probe achieves brain-wide neuronal activity recording in macaque brain

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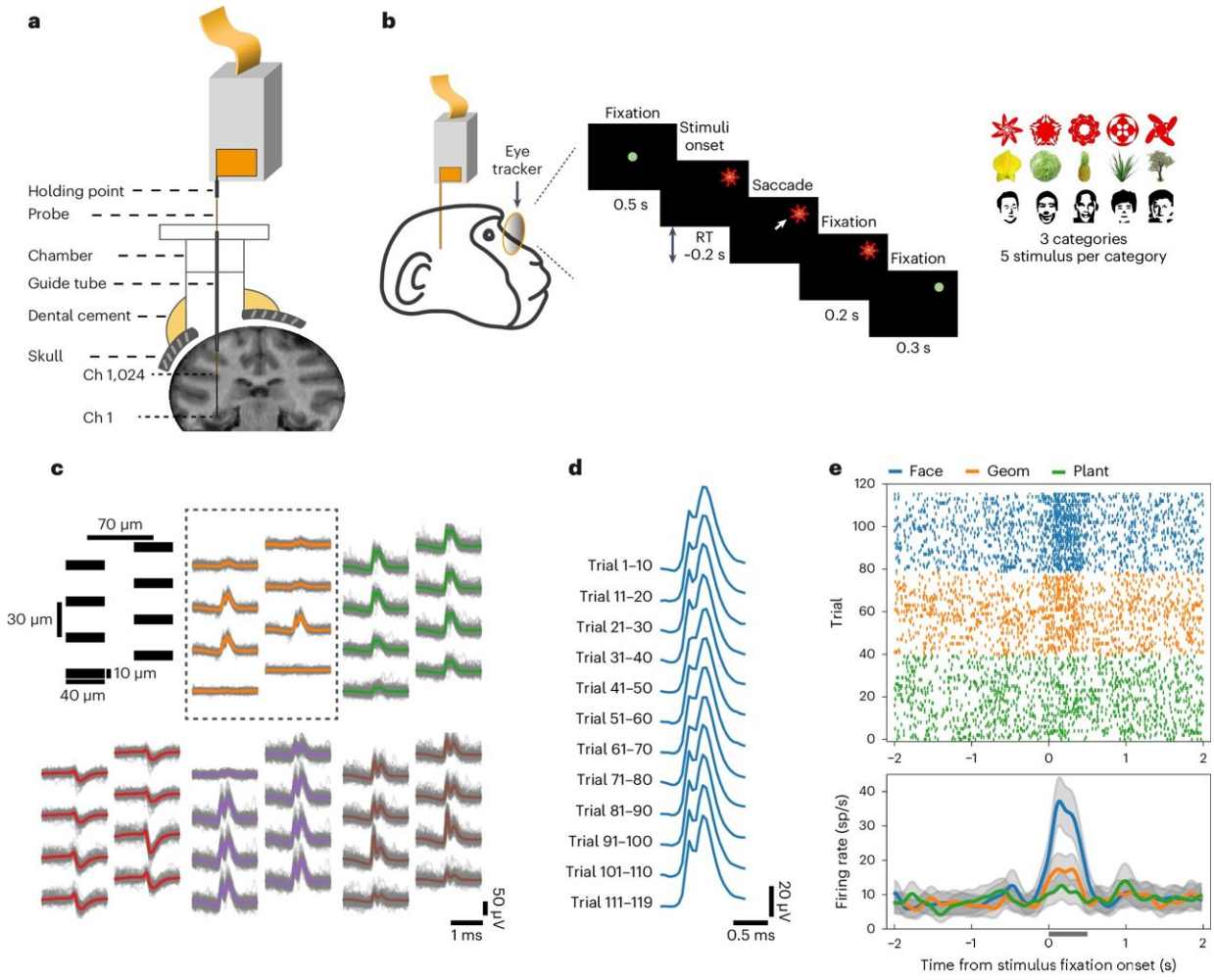

Recording in an awake rhesus macaque under a fixation-saccade task. a, Schematics showing the setup of the recording. b, Schematics showing the fixation-saccade task. c, Spatial footprint of some example SUAs. d, Waveforms averaged from different trials in a task session of the unit in c marked with the dashed box, showing the stability of the unit over different trials. e, Top, single-

trial spiking rasters of the neuron in c marked with the dashed box. Credit: *Nature Neuroscience* (2024). DOI: 10.1038/s41593-024-01692-6

Chinese researchers have developed a high-density, 1,024-channel neural probe, achieving a full-depth recording of neuronal activities in the brain of a macaque monkey for the first time in the world.

The research team led by Duan Xiaojie at Peking University designed and produced the probe named Neuroscroll, which isolates single neuronal activities simultaneously from 1,024 densely spaced channels flexibly distributed across the probe.

The probe length is tunable from 1 cm to 10 cm, covering the brain sizes ranging from those of rodent species to primates.

The team used the probes to achieve simultaneous monitoring of the activities of more than 700 single neurons covering the entire depth of the macaque monkey brain. In addition, they have realized stable neural recording in the rat brain for up to two years, demonstrating the excellent biocompatibility and long-term recording stability of the probe, said Duan.

The achievement was published in *Nature Neuroscience*.

Cheng Heping, director of the National Biomedical Imaging Center at Peking University, said that the breakthrough provides a powerful tool for simultaneously monitoring neuronal activities across multiple brain regions and exploring the relationship between neural activities and behavioral studies.

By implanting multiple probes, it will be possible to further achieve

neural recordings from up to tens of thousands of channels, which will bring transformative impacts to basic neuroscience and translational neuroscience research, such as brain-machine interfaces, said Cheng.

More information: Yang Liu et al, A high-density 1,024-channel probe for brain-wide recordings in non-human primates, *Nature Neuroscience* (2024). DOI: 10.1038/s41593-024-01692-6

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