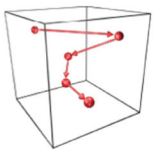
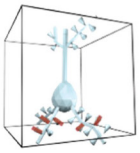
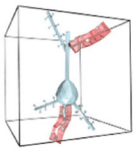
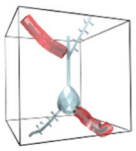
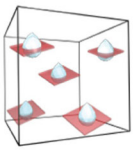
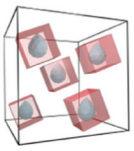
3D REGION SCANNING

FEMTO 3D ATLAS

	3D RANDOM-ACCESS POINT	3D TRAJECTORY AND MULTIPLE-LINE	3D RIBBON	3D SNAKE	3D CHESSBOARD	3D MULTI-CUBE
TECHNIQUES						
NUMBER OF SIMULTANEOUSLY SCANNED REGIONS	2000 cells <	up to 1000 spines	up to an 1000 µm long dendritic segment	up to 300 µm long dendritic segment	up to 300 regions	up to 30 volumes
BENEFITS IN NEUROSCIENCE	3D network imaging in large cell populations	dendritic imaging without interruption and recording activity of over 150 spines	imaging of activity in over 12 spiny dendritic segments	dendritic imaging during large amplitude movements	high speed somatic recordings, network imaging	imaging of somata during large amplitude movements

3D Chessboard scanning

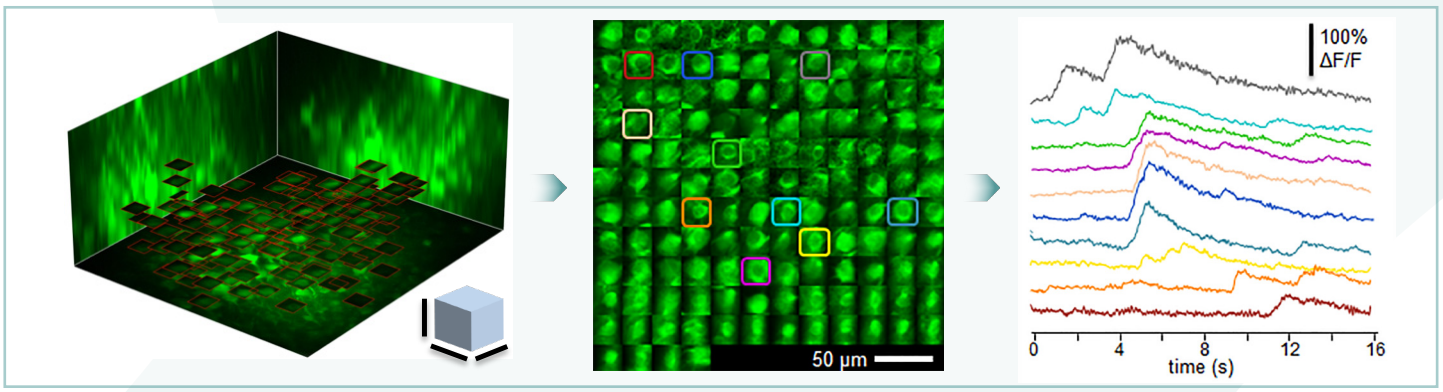


*Figure 2: Chessboard scanning of neuronal networks in **behaving animals**. Left: Neurons from a mouse V1 region were labeled with GCaMP6f sensor. Neuronal somata and background areas were selected according to a Z-stack taken at the beginning of the measurements. Scale bars, 50 µm. Middle: selected frames are "transformed" into a 2D "chessboard," where the "squares" correspond to single somata. Right: representative somatic Ca^{2+} responses derived from the color-coded regions.*

3D Ribbon scanning

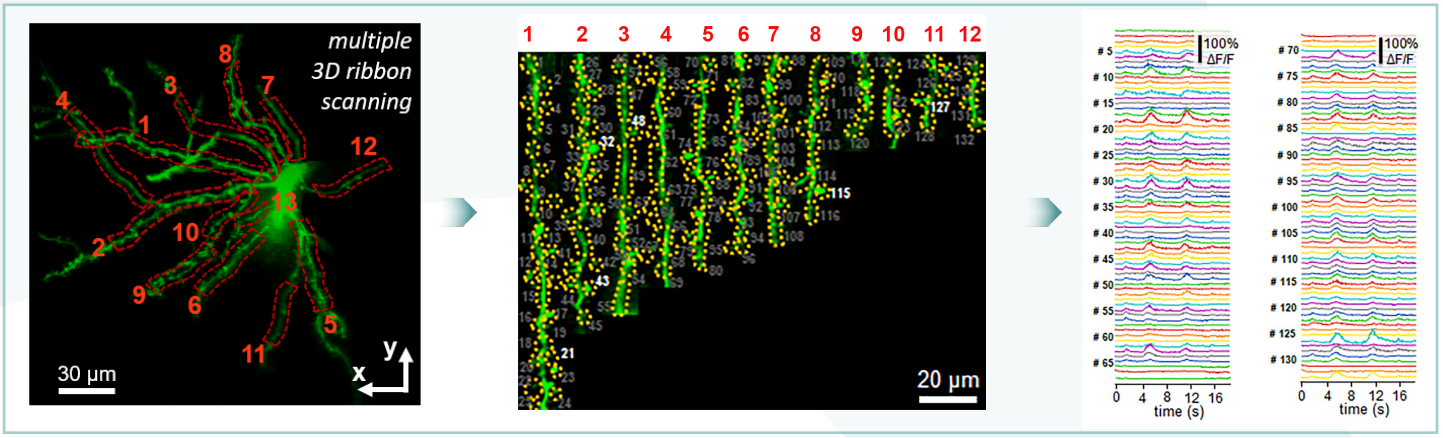
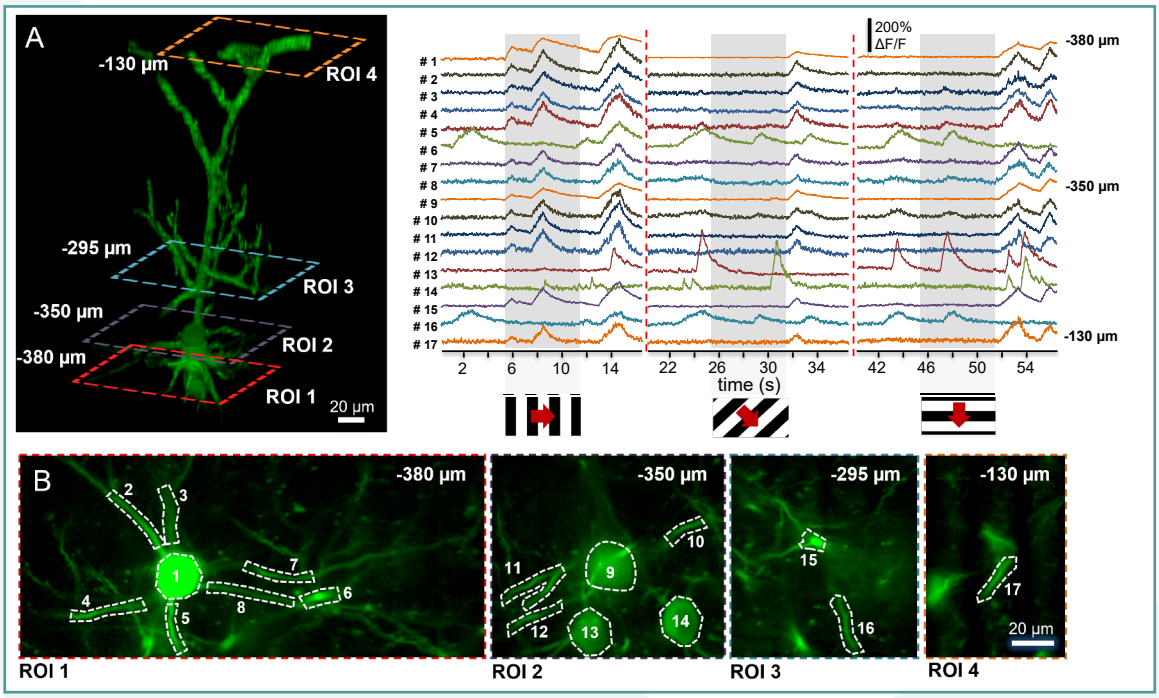


Figure 3: Imaging of multiple spiny dendritic segments with 3D ribbon scanning in behaving animals. Left: maximal intensity x-y projection of a GCaMP6f-labeled layer II/III pyramidal neuron. Numbered frames indicate the 12 3D ribbons used to record twelve spiny dendritic segments using 3D ribbon scanning. Middle: a frame from the measurement with 132 measurement ROIs on spines and dendritic segments. Right: transients derived from 132 numbered regions.

3D Multilayer scanning



Three-dimensional view of a layer II/III neuron labeled with the GCaMP6f sensor. Rectangles indicate four simultaneously imaged layers (ROI 1–4). Numbers indicate distances from the pia mater. Representative Ca2+ transients were derived from the numbered subregions shown.

3D Snake scanning

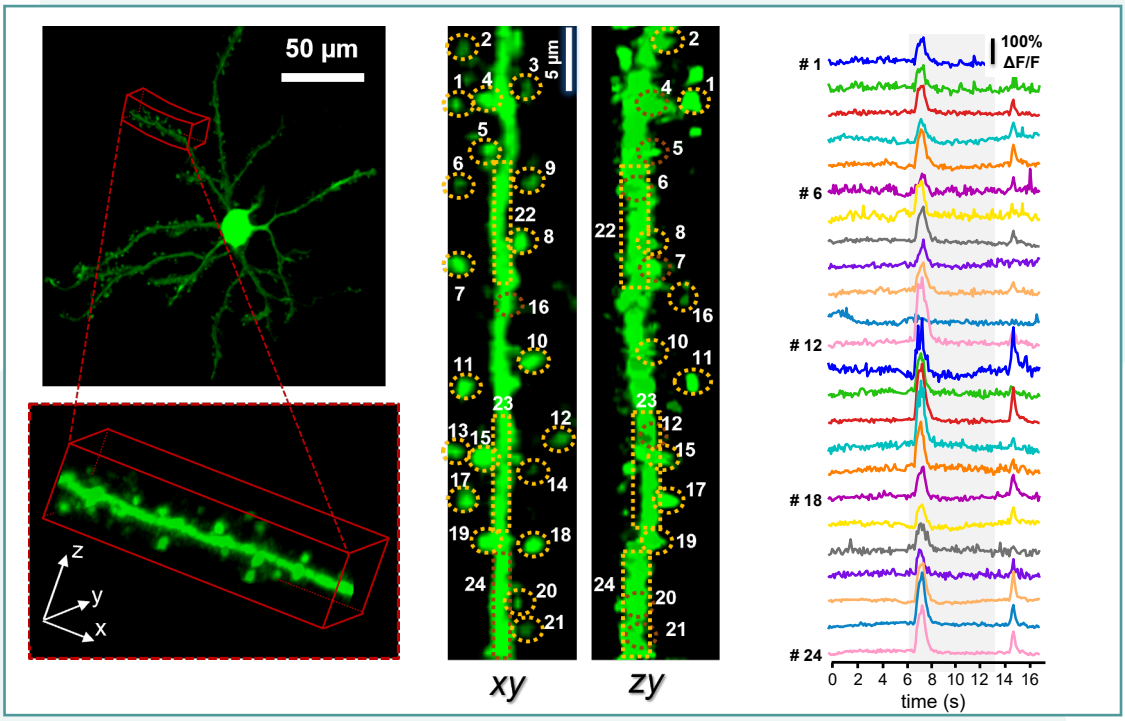


Figure X: Z projection of a pyramidal neuron in the V1 region labeled with GCaMP6f sensor using sparse labeling. Fast snake scanning was performed at 10 Hz in the selected dendritic region. In x-y and z-y plane projections, the selected spikes to be measured are shown. Right, representative spontaneous Ca2+ responses derived from the coded subvolume elements.

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