

Применение лазеров в медицине



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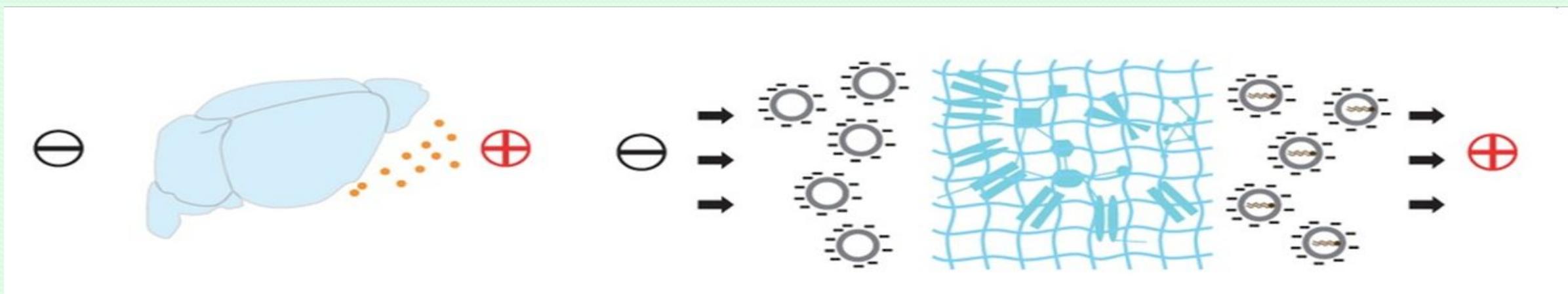
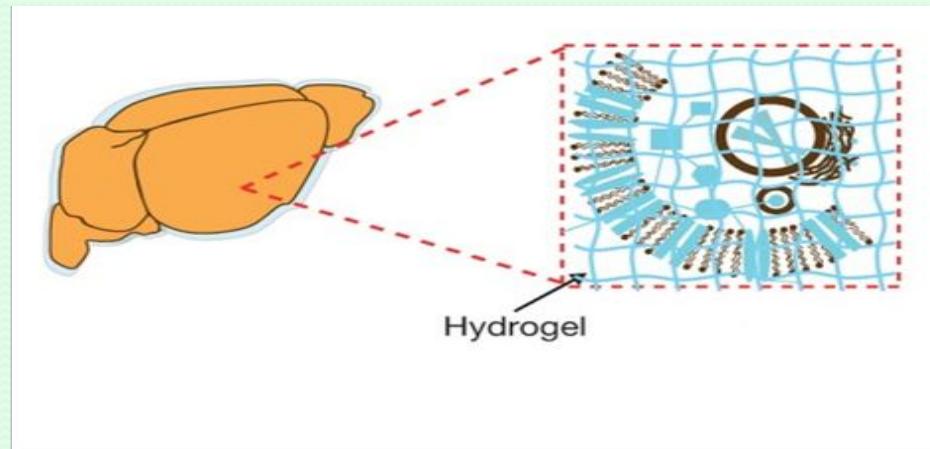
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Великого

- Перспективные современные исследования на клеточном и молекулярном уровне обязательно включают этап лазерных технологий.
- Технологии световой микроскопии с применением лазеров постепенно переходят на новый уровень – исследования в объеме.

Brain structures visualizing using CLARITY protocol for immunochemical studying of optically transparent mouse brain

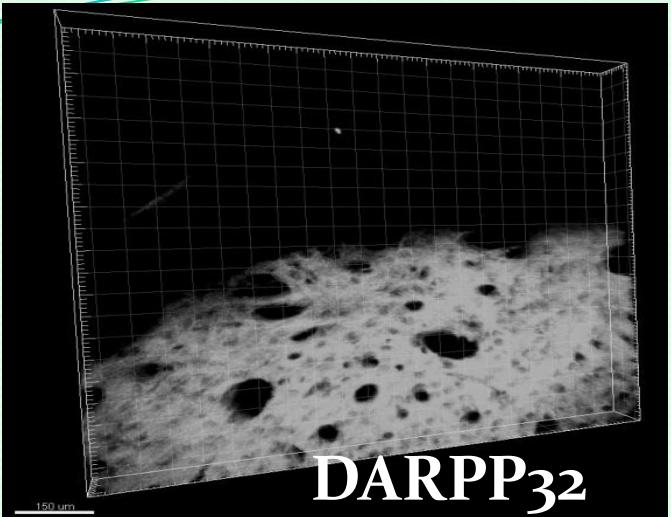
CLARITY (Clear, Lipid-exchanged, Anatomically Rigid, Imaging/immunostaining compatible, Tissue hydrogel)

It was developed by [Karl Deisseroth](#) and his colleagues at the [Stanford University School of Medicine](#).

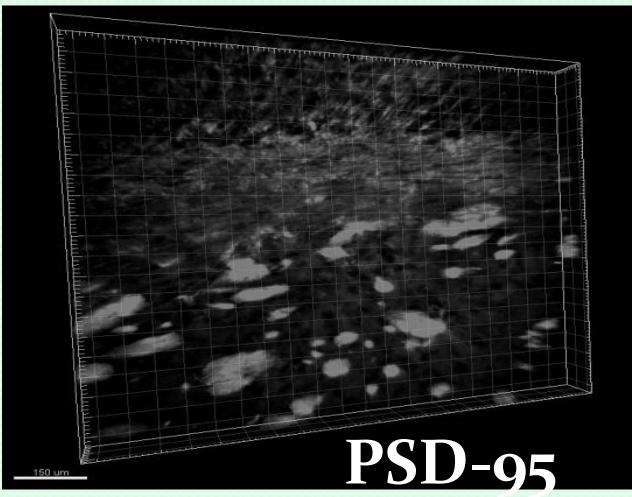


PSD-95, DARPP-32 staining. Cortex and striatum region

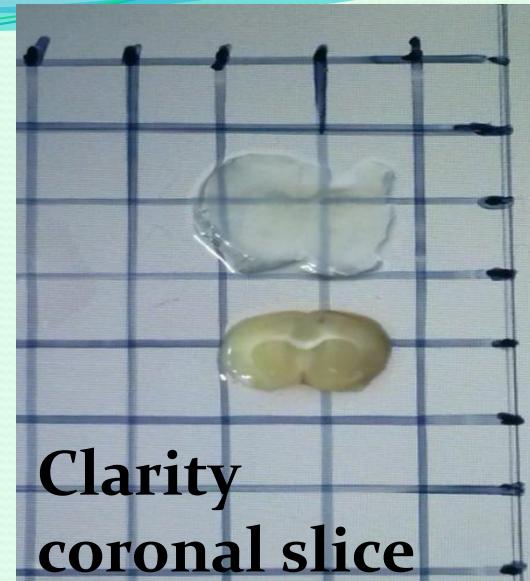
A



B

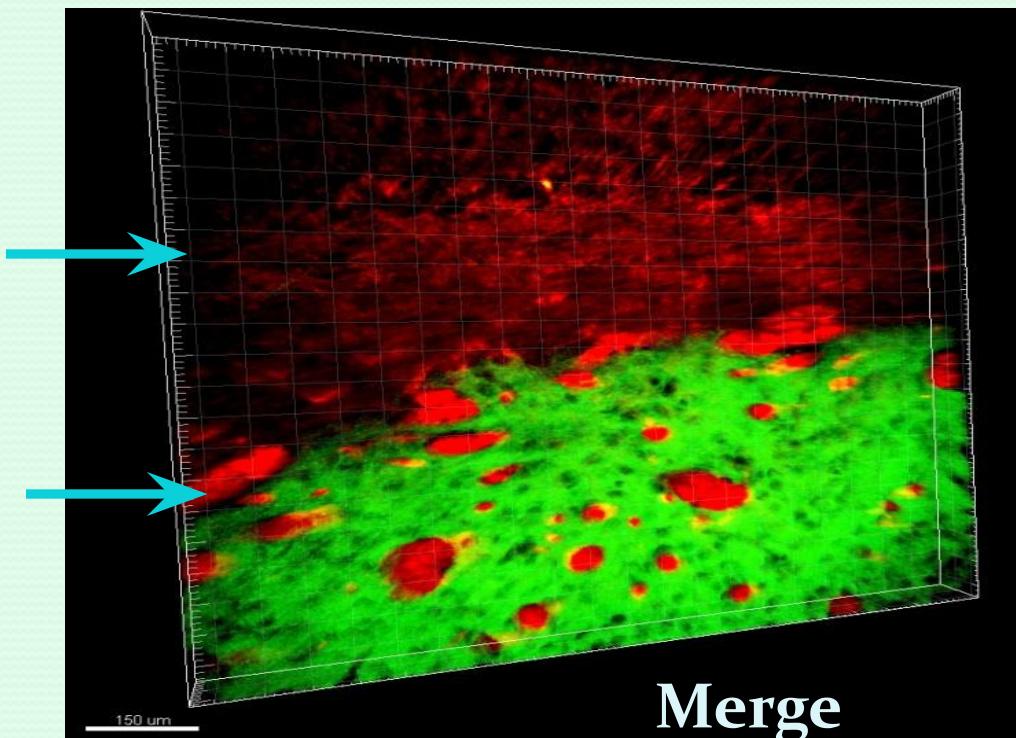


E

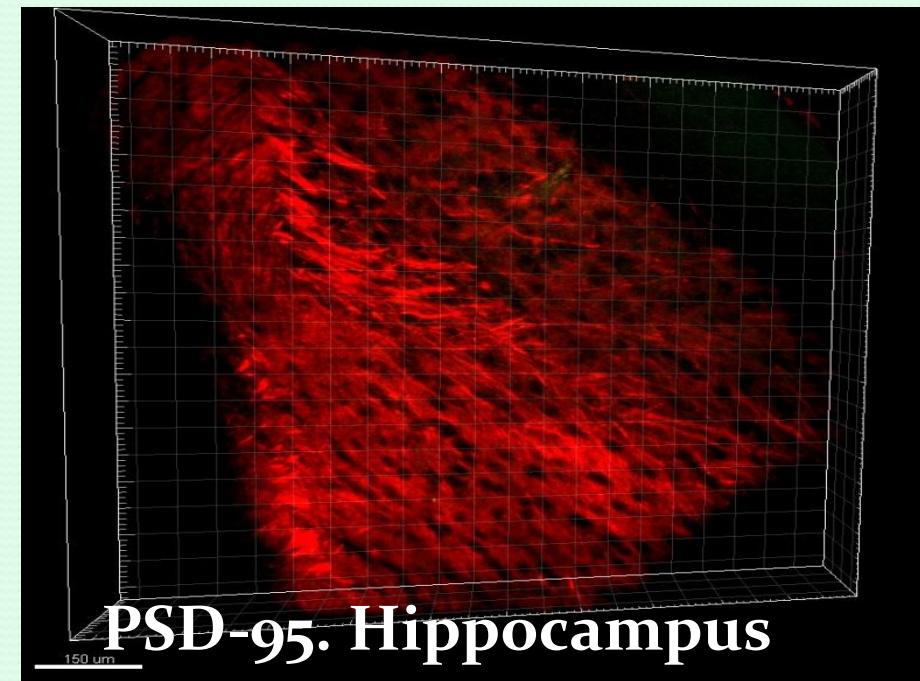


C

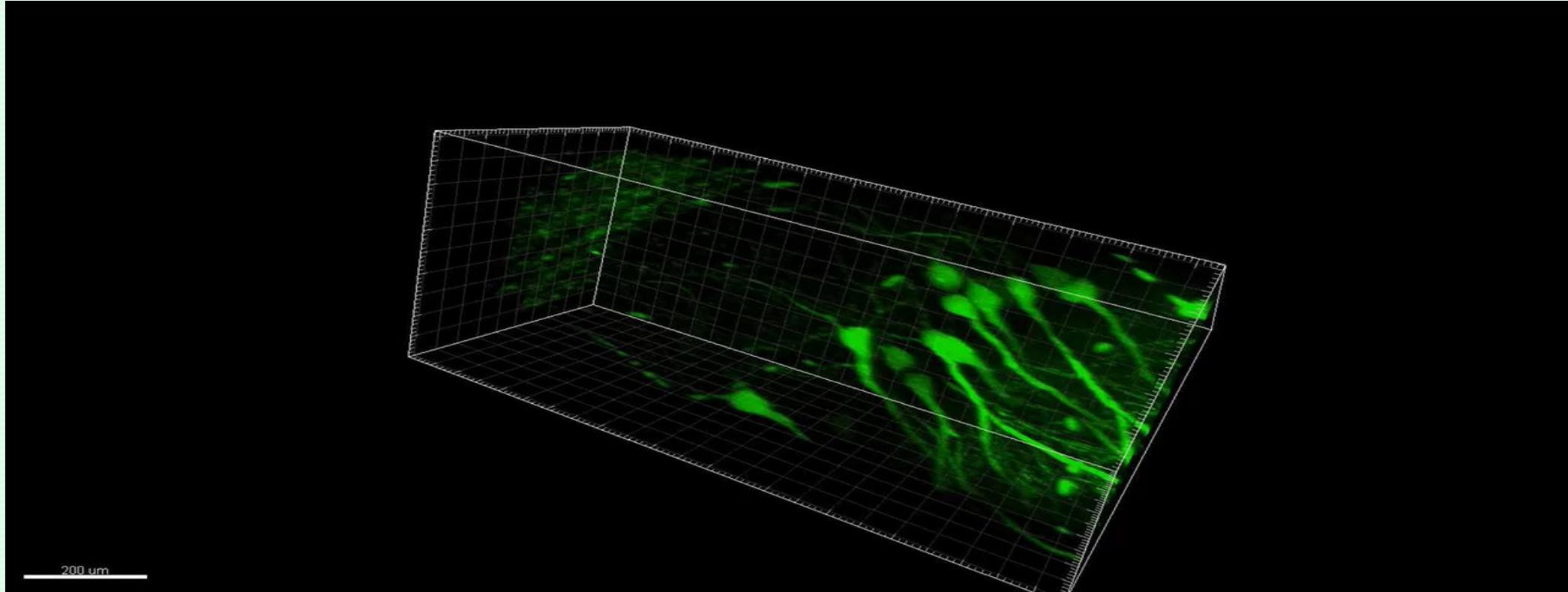
Cortex



D

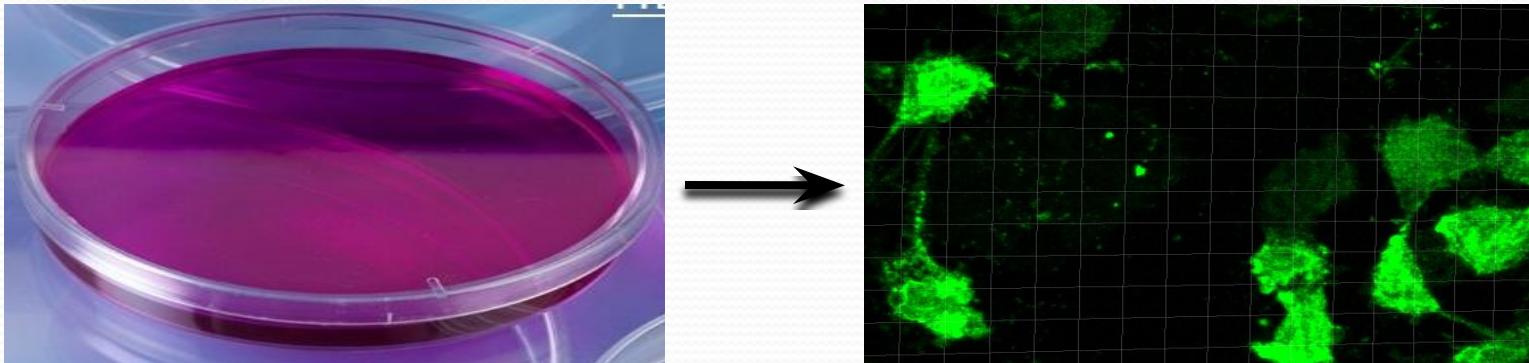


Thy1-GFP M-line
Hippocampal neurons
3D reconstruction



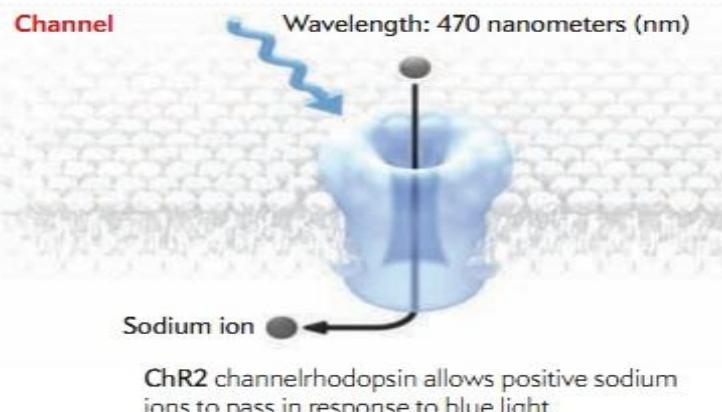
Ontogenetic project

Step 1: transfection

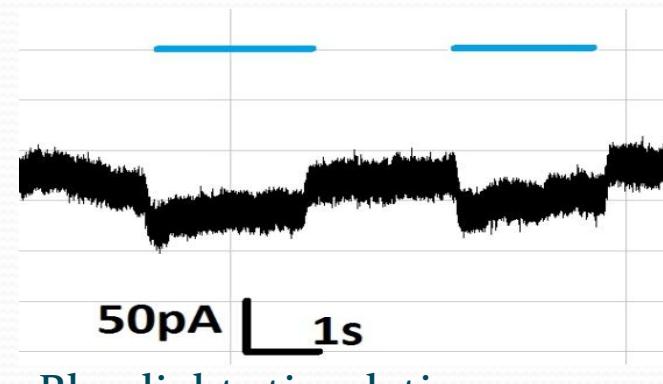


Cell culture: HEK-293T
Use: ChR₂
(*Channelrhodopsin2*)
Control: RFP (green light)

Step 2: activation opsins with light



Change configuration under light



Recording: patch-clamp
Configuration: whole-cell
Light: blue (470nm)

Methods and techniques

- Nerve cell isolation and cell culturing
- Cell transfection
- Confocal and Multiphoton fluorescence microscopy
- Proteomics: protein electrophoresis and western blot analysis
- Genotyping
- Optogenetics