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Methods and techniques applied at the lab:

- Caged Compounds: design, synthesis, characterization and bioassays of photoreleased drug effect
- Photostimulation: Stimulation by photorelease of caged compounds. Very high spatial and temporal resolution. Superfast response (no fluid mixing, no mechanical artifacts)
- Photostimulation of genetically-encoded light-sensitive ion channels
- Cell Culture: Primary neuronal cell culture. Culture of cell lines like HeLa, HEK, CHO, etc. (Setting up Neurosphere assay).
- Monitoring of intracellular  $[Ca^{++}]$  through Genetically Encoded Calcium Indicators (GCaMP , JRGECO, etc)
- Drug effects monitoring by patch-clamp methods
- Time-lapse microscopy of cell cultures or developing small embryos (ZFish)
- Small animal surgery, stereotactic surgery
- *in vivo* electrophysiology: microelectrode recordings & local field potentials (MER, LFP)
- Stereotactic lesioning: experimental Parkinson's disease in rodents (6OHDA)
- Computational modeling
- Software and hardware development for biomedical signals acquisition and processing
- Embedded electronic firmware development, electronic signals control and processing
- PCB design and development with CAD software
- Clinical trials