

## Neuronal circuit development

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### ■ Team overview

The aim of our research is to study neuronal circuit development in the mouse, focusing on two stages: i) the establishment of neuronal network architecture during an early phase of development; ii) the reorganization of these networks during late postnatal development. We study those phenomena both at the molecular and cellular level. Our approach relies on transgenic mice expressing fluorescent proteins, which allow one to visualize neurons and their processes by fluorescence microscopy. In particular, we use a novel imaging technique called Brainbow, which drives the combinatorial expression of distinct colors of fluorescent proteins in neurons. Using this multicolor labelling, multiple neurons in a circuit can be visualized simultaneously. We initially apply this strategy to a model circuit, the auditory circuit devoted to sound localization. We use it to study the architecture and development of this circuit in combination with classic molecular approaches. In parallel and in collaboration with other teams, we are transposing the Brainbow technique to other cell types, such as the oligodendrocytes myelinating central axons. We also attempt to develop new technique to label mouse neuronal circuits.

### ■ Techniques used

- Visualization of neuronal circuits using "Brainbow"; transgenic mice. In Brainbow mice, neurons are labeled with combinations of fluorescent proteins of distinct colors (histology, confocal microscopy, neuronal tracing and 3D reconstruction).
- Generation and usage of transgenic mice, genetically modified for visualizing cellular interactions in the nervous system (molecular biology, transgenic mice generation).

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## ■ Website

[www.fondave.org/-Equipe-de-J-Livet-.html](http://www.fondave.org/-Equipe-de-J-Livet-.html)