• inform you about cutting edge techniques in genetic manipulation of the nervous system and neuronal tracing

• explain the mode of action of genetic tools for neuronal manipulation and tracing

• show the power of combining genetic with optical techniques (microscopy) to understand the brain

• demonstrate the usefulness, power and beauty of the *Drosophila* brain as a genetically tractable model in neuroscience

Learning outcomes:

• you should understand the working principles of binary expression systems
• you should understand the principles of genetic manipulation of neuronal activity
• you should understand the principles of genetic tracing of neuronal circuits
• you should understand the principles of genetically encoded activity sensors

• don't bother too much about the applied examples, they just serve to give biological context

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