Cre/Flp Lines

These are recombinase proteins knocked into specific cell types based on promoters.
These recombinases can then cleave knocked-in genes in "reporter lines" enabling specific capabilities.

Neurovascular Lines

*** smMHC-cre**
smooth muscle cells throughout the body, including neurovasculature

*** YWA-cre**
endothelial cells of the vasulature

*** FoxJ-cre**
ependymal cells of the choriod plexus

Neocortical Lines

Cortical Projection Cells

*** Sepw-Cre (aka Selenow)**
Layer 2/3 cortical neurons including those projecting to layer 5 and basal ganglia

*** RBP4-Cre**
Layer 5 cortical neurons including those projecting to the basal ganglia

Local Cortical Interneurons

*** pvalb-cre/flp (aka PV)**
GABAergic cell that expresses calcium-binding protein parvalbumin
We have 2 variants pvalb-cre/flp and PV-2A-CreER. ER needs tta or tomoxifen.

*** sst-cre/flp (aka SOM)**
GABAergic cell that expresses the peptidergic transmitter somatostatin

*** VGAT-cre**
GABAergic interneurons expressing vescicular GABA transporter (mostly all)

*** Ascl1-cre**
Developmental marker that defines a PV+ subpopulation.

Basal Ganglia Related Lines

*** A2A-cre**
Striatal spiny neurons containing D2 receptors

*** DAT-cre**
Dopaminergic neurons in the midbrain and retina.

"Reporter Lines"

These harbor genetic tools 'unmasked' in Cre or Flp expressing cells.

***GCaMP6f (Ai93)**: Calcium Indicator: to image spiking*

***tta:** Produces tta (tomoxifen analog)*

***tdTomato:** Variant of red fluorescent protein: marks cells red*

***ChETA:** Allows cells to be depolarized with blue light*

***CatCh (Ai80):** Allows cells to be depolarized with blue light (more Ca2+ permiable)*

***Halo (Halorhodopsin):** Allows cells to be hyperpolarized with orange light*

***Chronos:** Allows cells to be depolarized with blue light (rapid kinetics)*

***RCL-hChR2 (Ai27):** Allows cells to be depolarized with blue light (fused to tdTomato)*

***LMO3:** Allows cells to be depolarized with blue light*
also fused with a bioluminescent protein to make light

BAC Transgenic Lines

These animals have a bacterial artificial chromosome that contains a promoter and gene knocked-in to a subset of neurons' germline. These mice are less flexible than combining cre/flp lines with reporters. We have been phasing out their use because our experiments are highly dynamic.

*** Thy1-GCaMP6f**
GCaMP6f (calcium indicator) knocked into a subset of Layer 5 cortical neurons.