

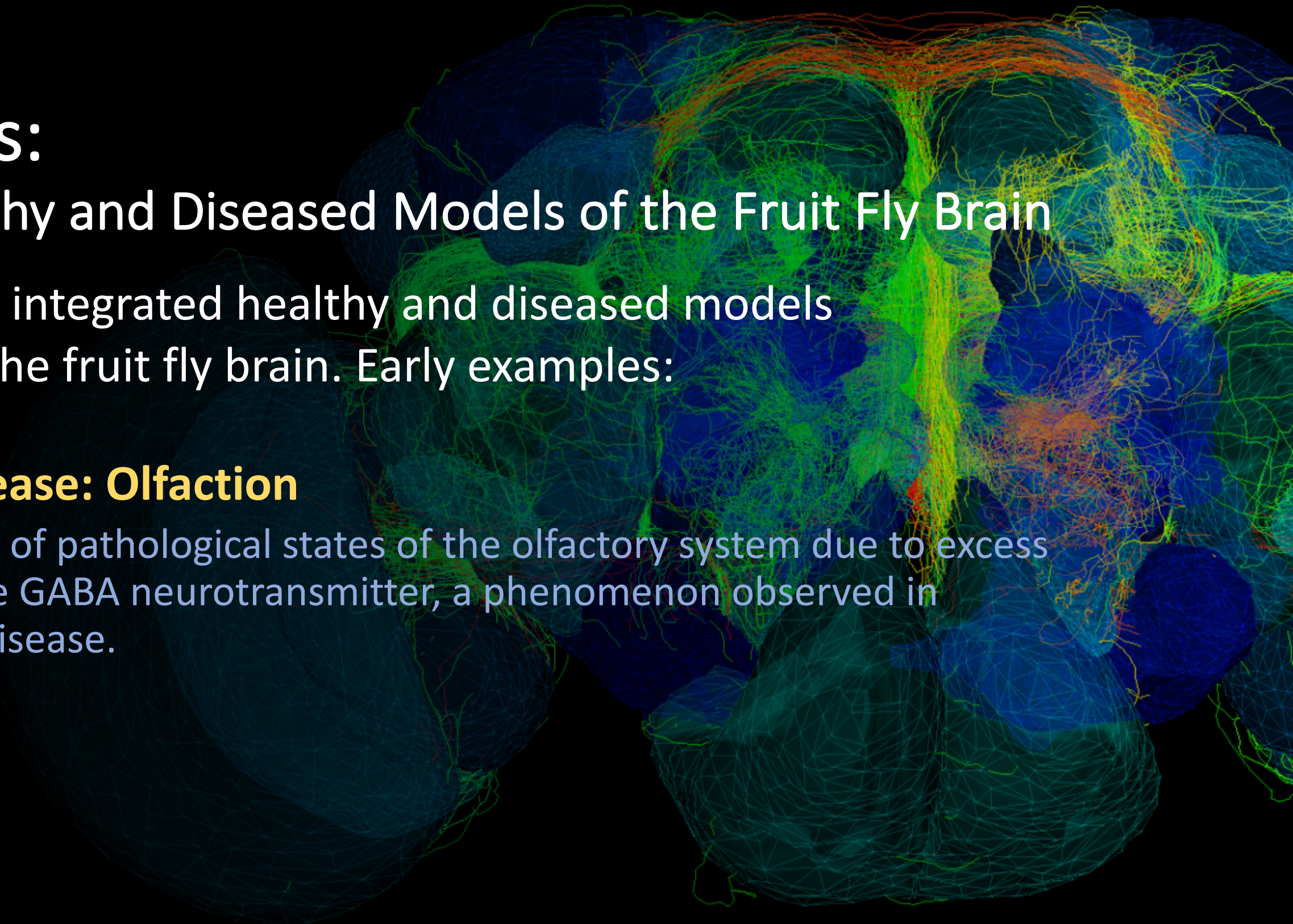
NeuroAPPs:

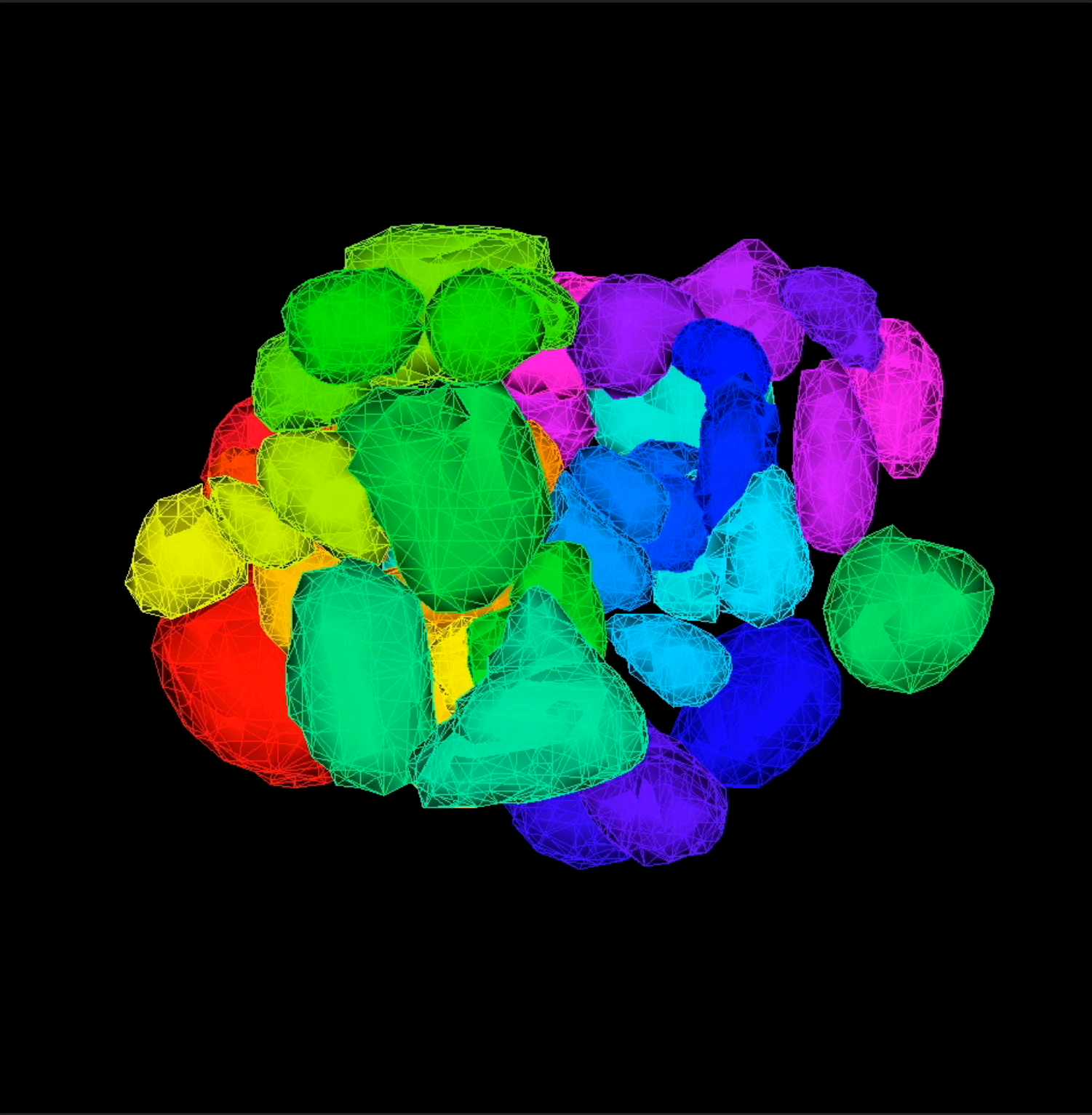
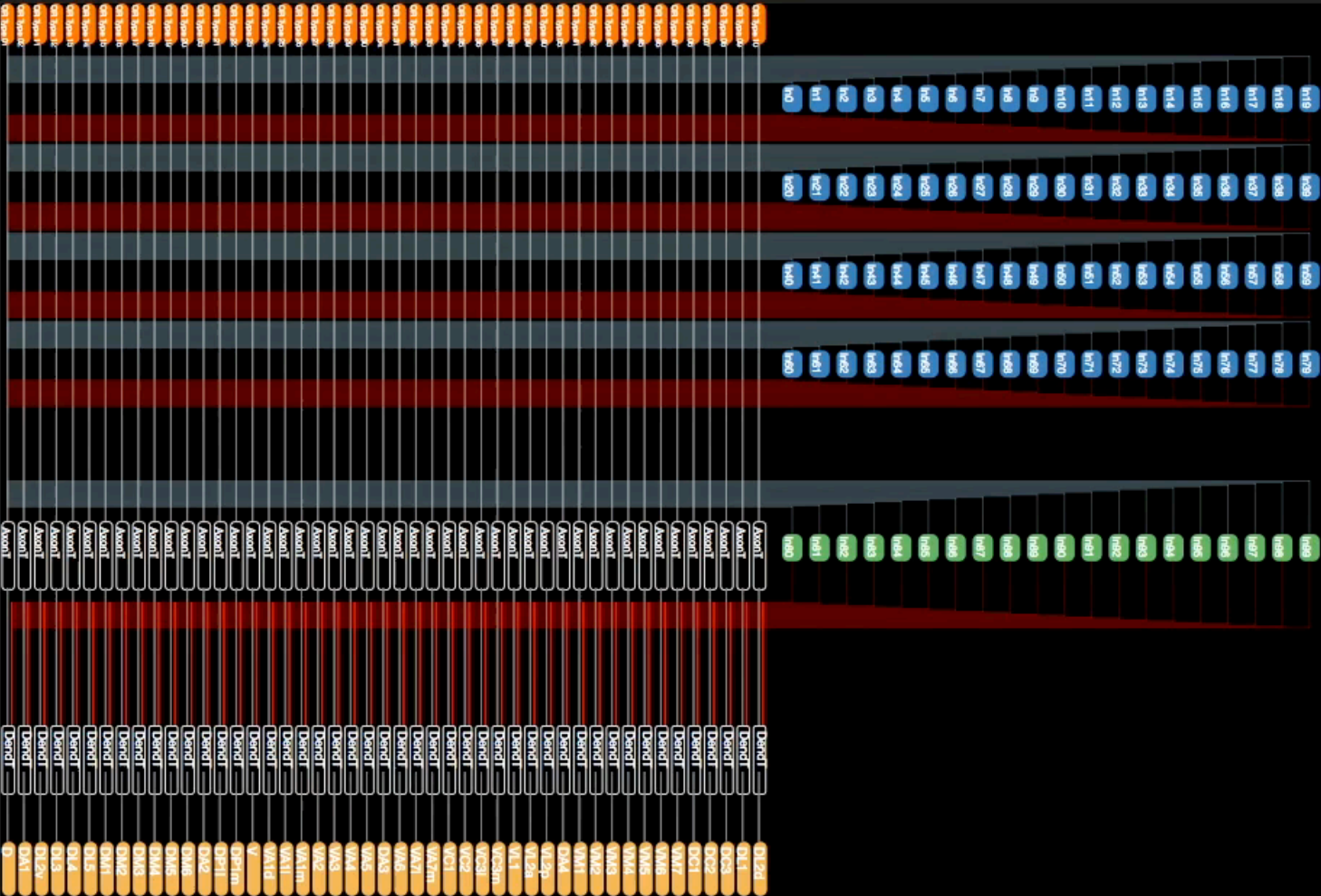
Apps for Healthy and Diseased Models of the Fruit Fly Brain

NeuroAPPs host integrated healthy and diseased models applications of the fruit fly brain. Early examples:

Parkinson's Disease: Olfaction

- an emulation of pathological states of the olfactory system due to excess release of the GABA neurotransmitter, a phenomenon observed in Parkinson's disease.





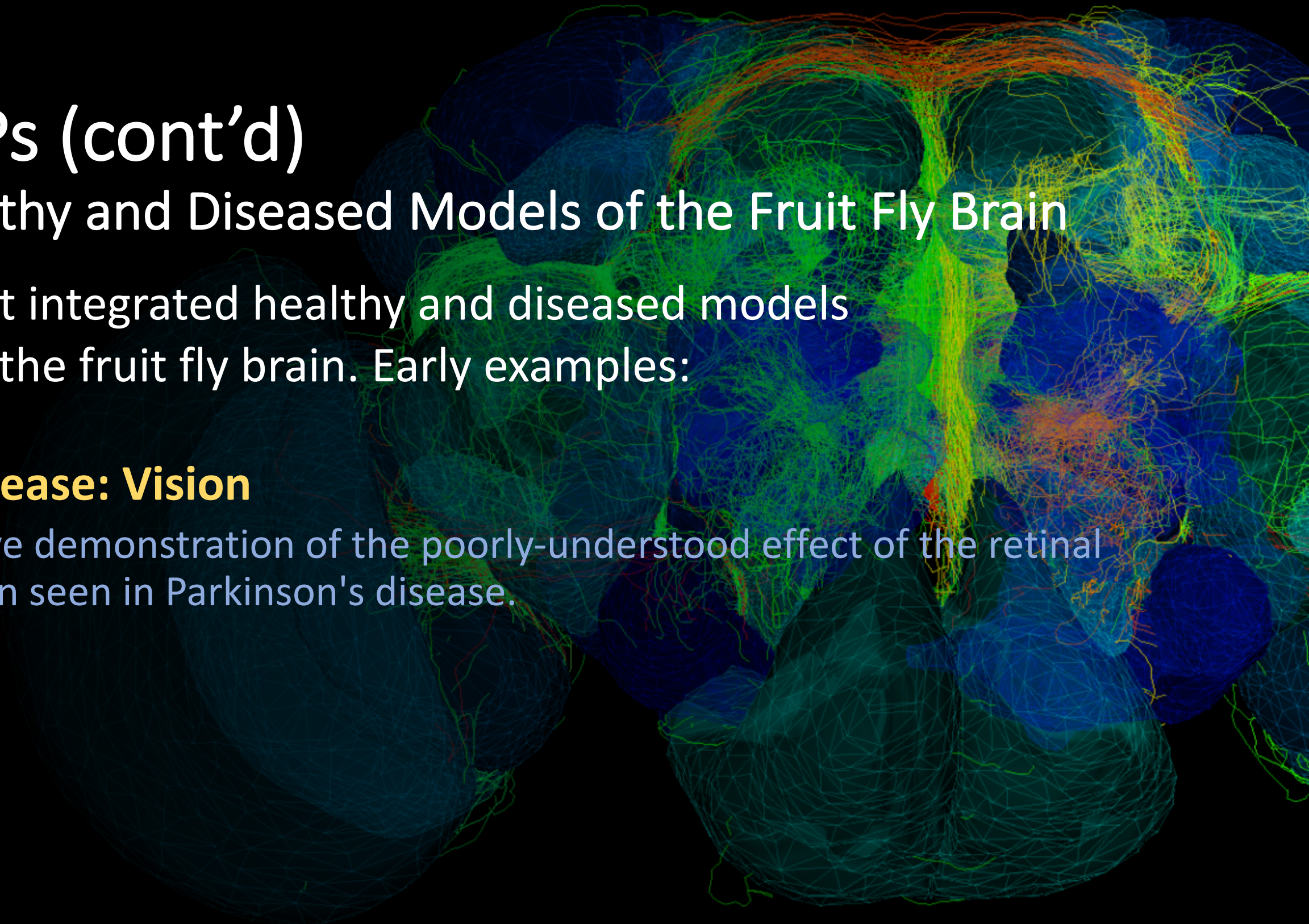
NeuroAPPs (cont'd)

Apps for Healthy and Diseased Models of the Fruit Fly Brain

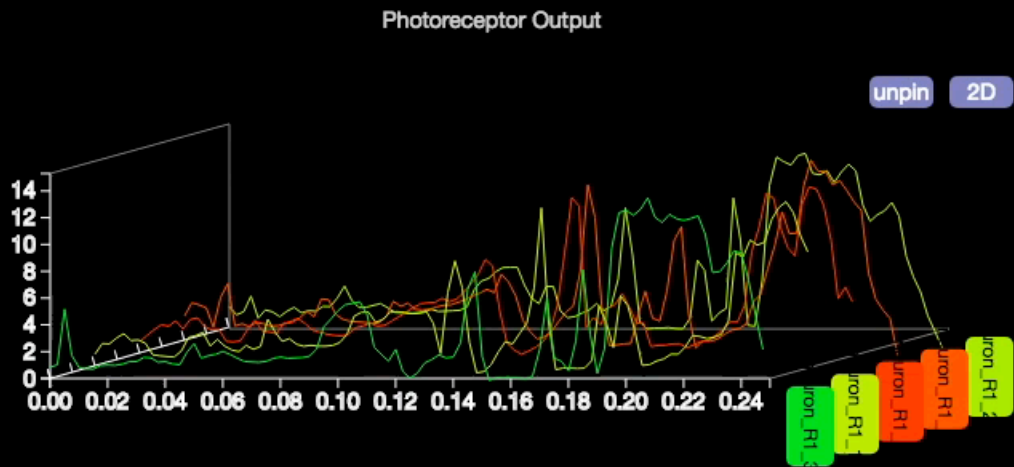
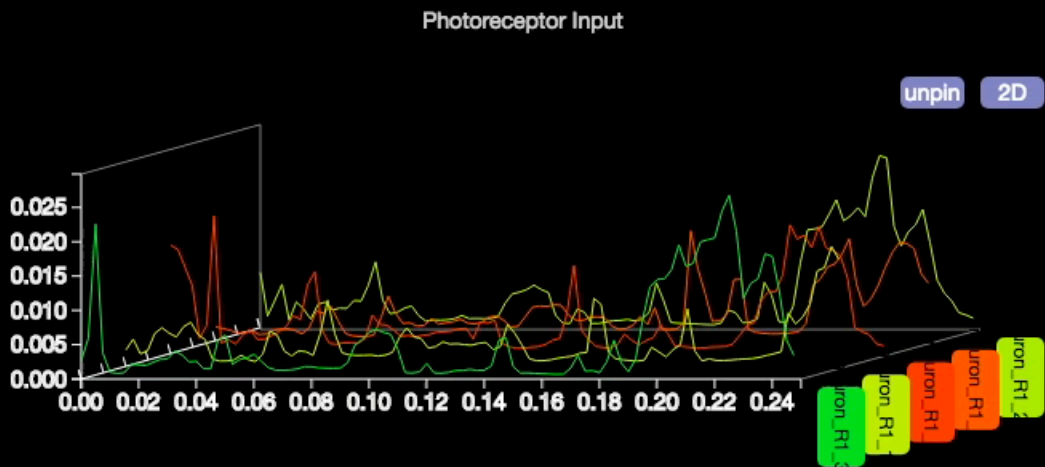
NeuroAPPs host integrated healthy and diseased models applications of the fruit fly brain. Early examples:

Parkinson's Disease: Vision

- an interactive demonstration of the poorly-understood effect of the retinal degeneration seen in Parkinson's disease.



Parkinsons Disease Model



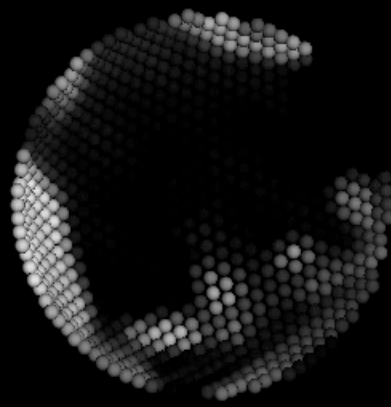
Natural Scene



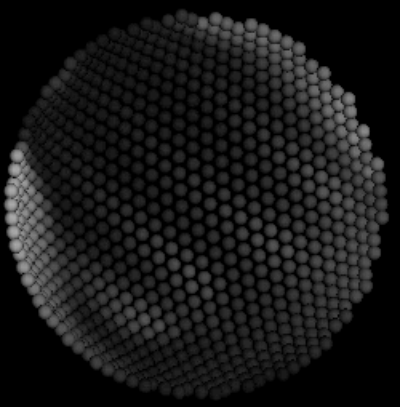
Visual Field



Healthy Retina



Diseased Retina



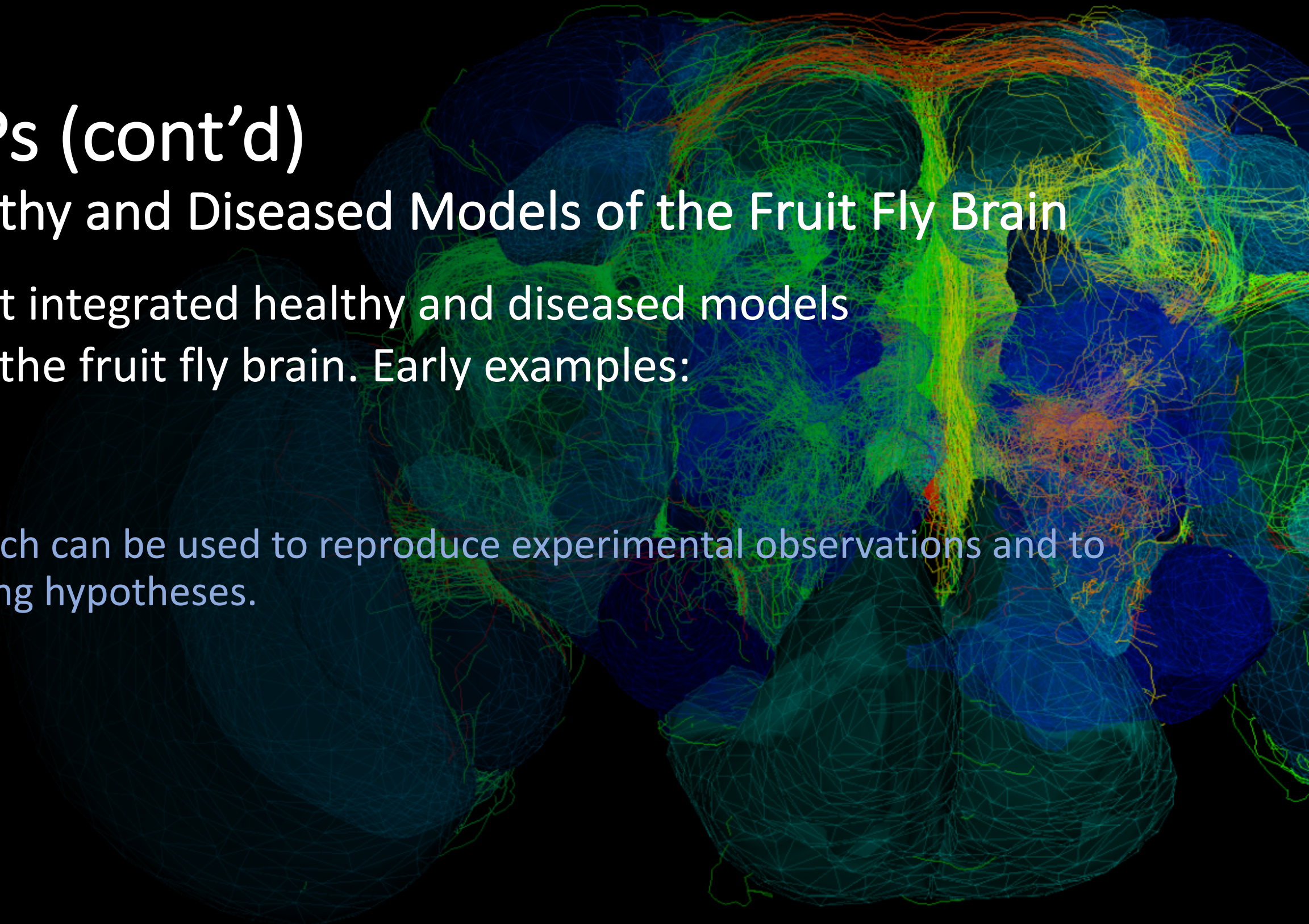
NeuroAPPs (cont'd)

Apps for Healthy and Diseased Models of the Fruit Fly Brain

NeuroAPPs host integrated healthy and diseased models applications of the fruit fly brain. Early examples:

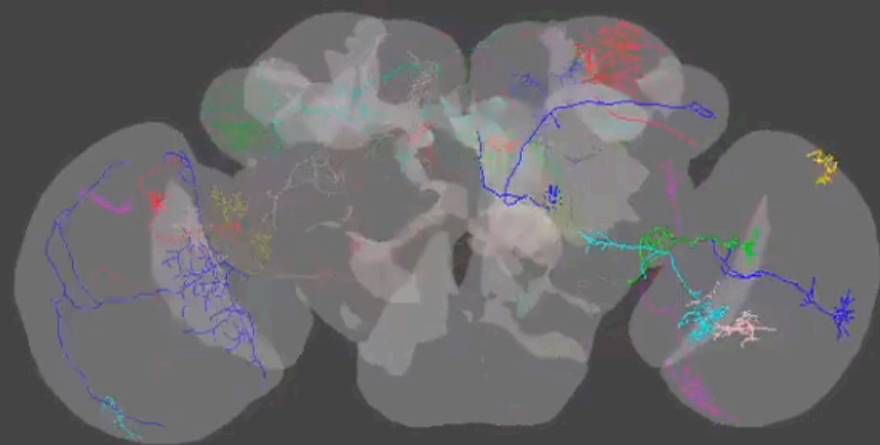
Epilepsy Model

- a model which can be used to reproduce experimental observations and to verify working hypotheses.



2101 ms

stimulus onset

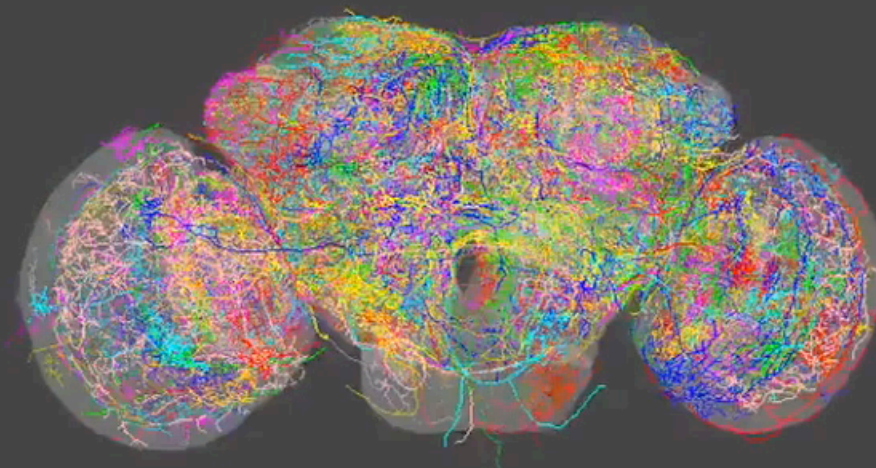


firing rate : 0.86 Hz

Healthy

2101 ms

stimulus onset

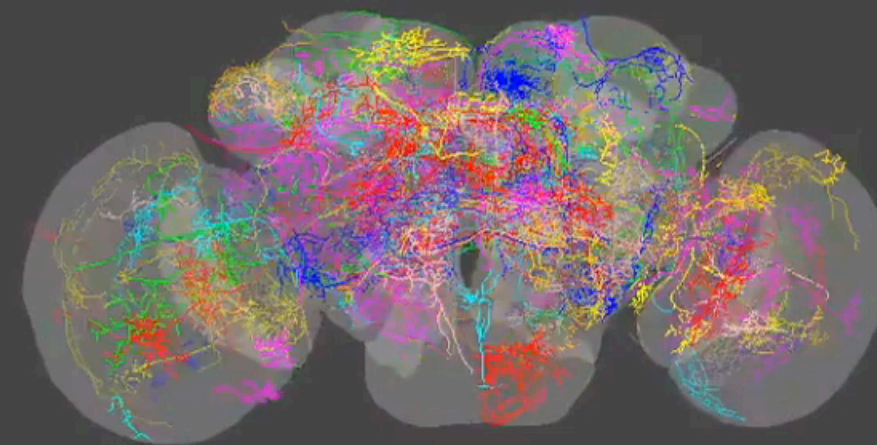


firing rate : 13.15 Hz

Epileptic

2101 ms

stimulus onset



firing rate : 6.05 Hz

Rescued

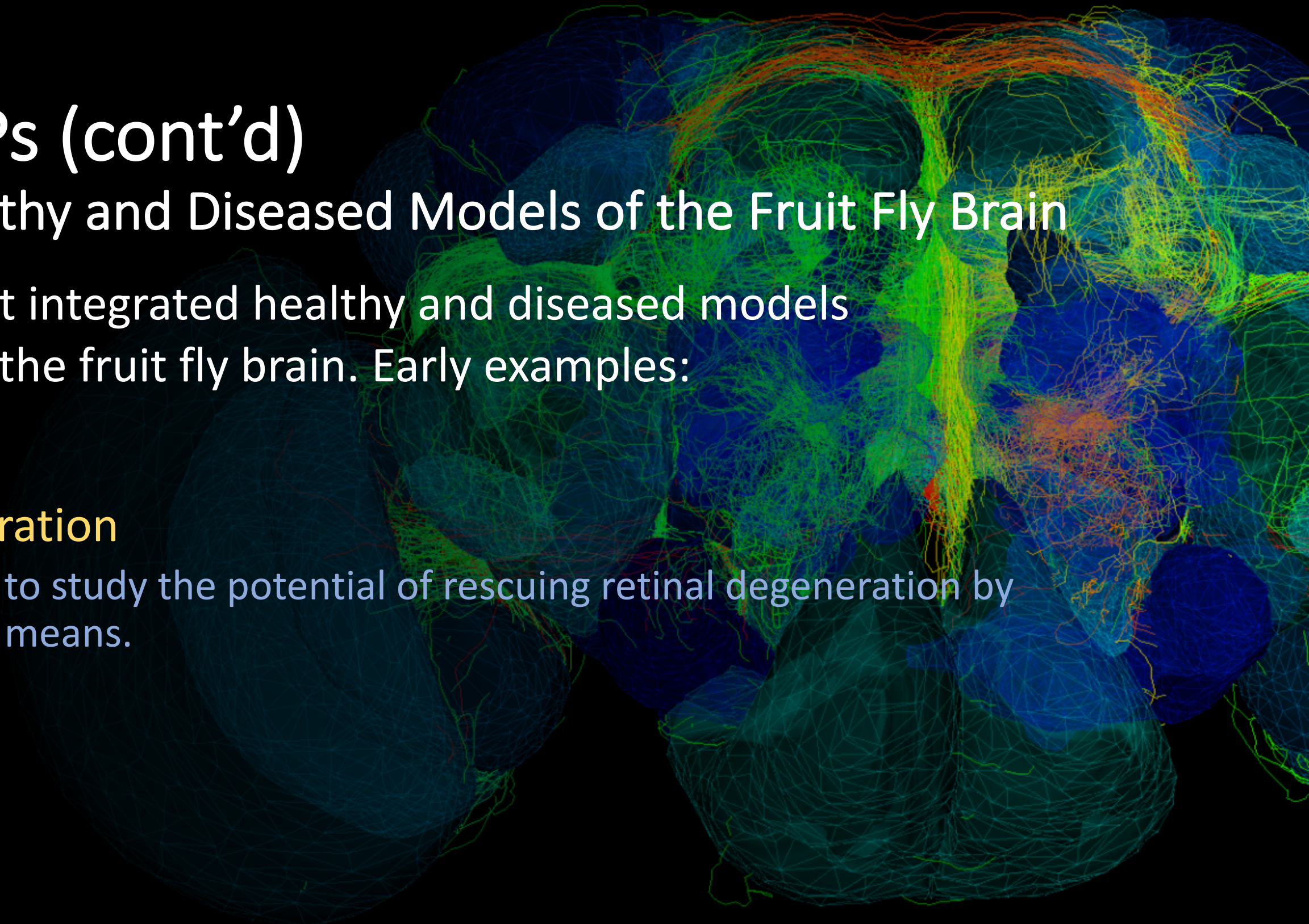
NeuroAPPs (cont'd)

Apps for Healthy and Diseased Models of the Fruit Fly Brain

NeuroAPPs host integrated healthy and diseased models applications of the fruit fly brain. Early examples:

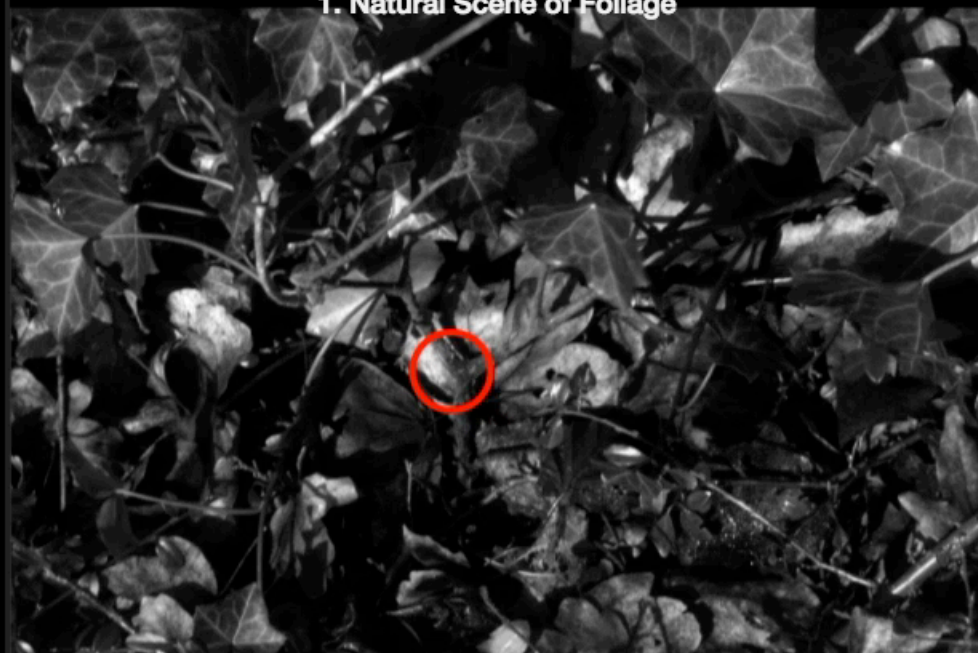
Retinal Degeneration

- a retina app to study the potential of rescuing retinal degeneration by optogenetic means.

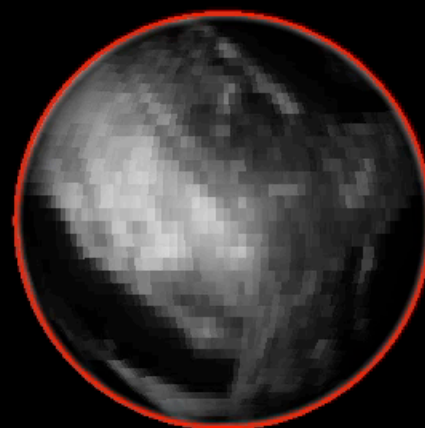




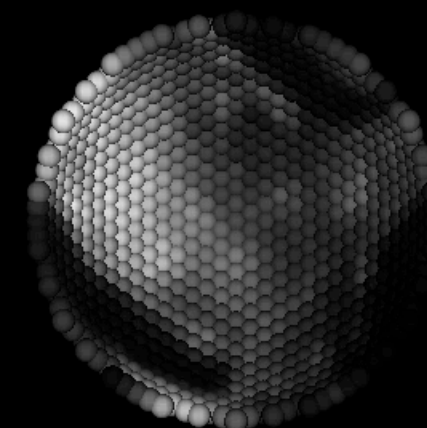
1. Natural Scene of Foliage



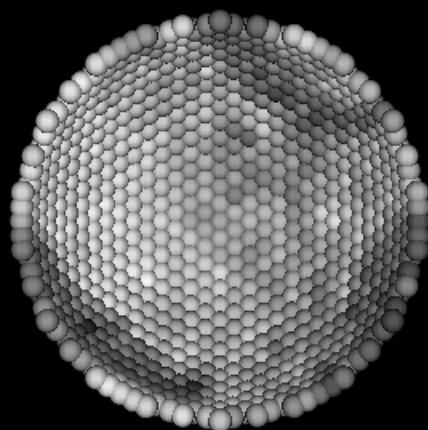
2. Visual Field



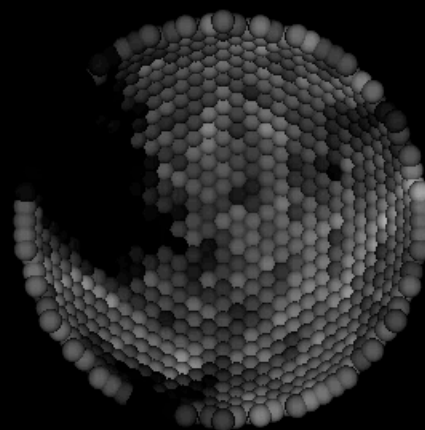
3. Inputs (photons/second) to Photoreceptor Array



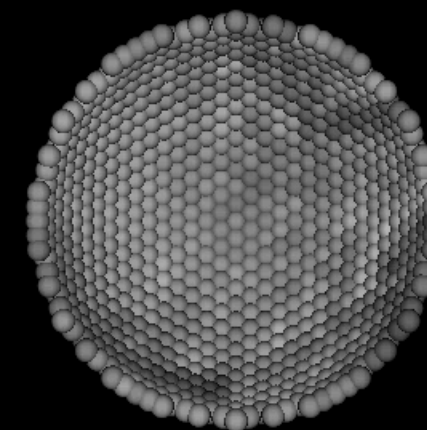
4. Responses (membrane voltage) of Healthy Photoreceptors



5. Responses of Diseased Photoreceptors (with 5% of microvilli and limited rhodopsins)



6. Photoreceptors Rescued by Expressing Channelrhodopsin



0.19

0.0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1.0