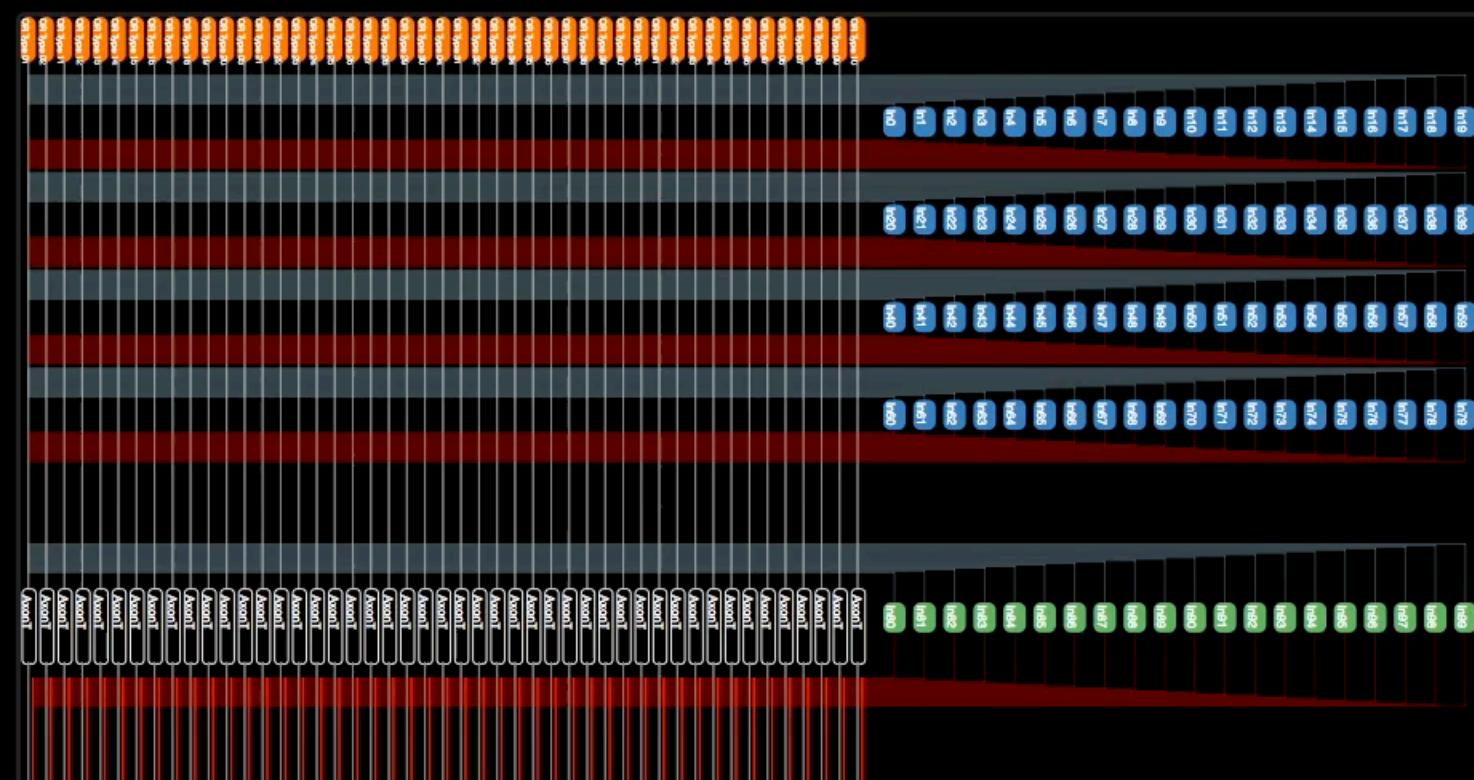


# NeuroAPPS: Apps for Healthy and Diseased Models of the Fruit Fly Brain

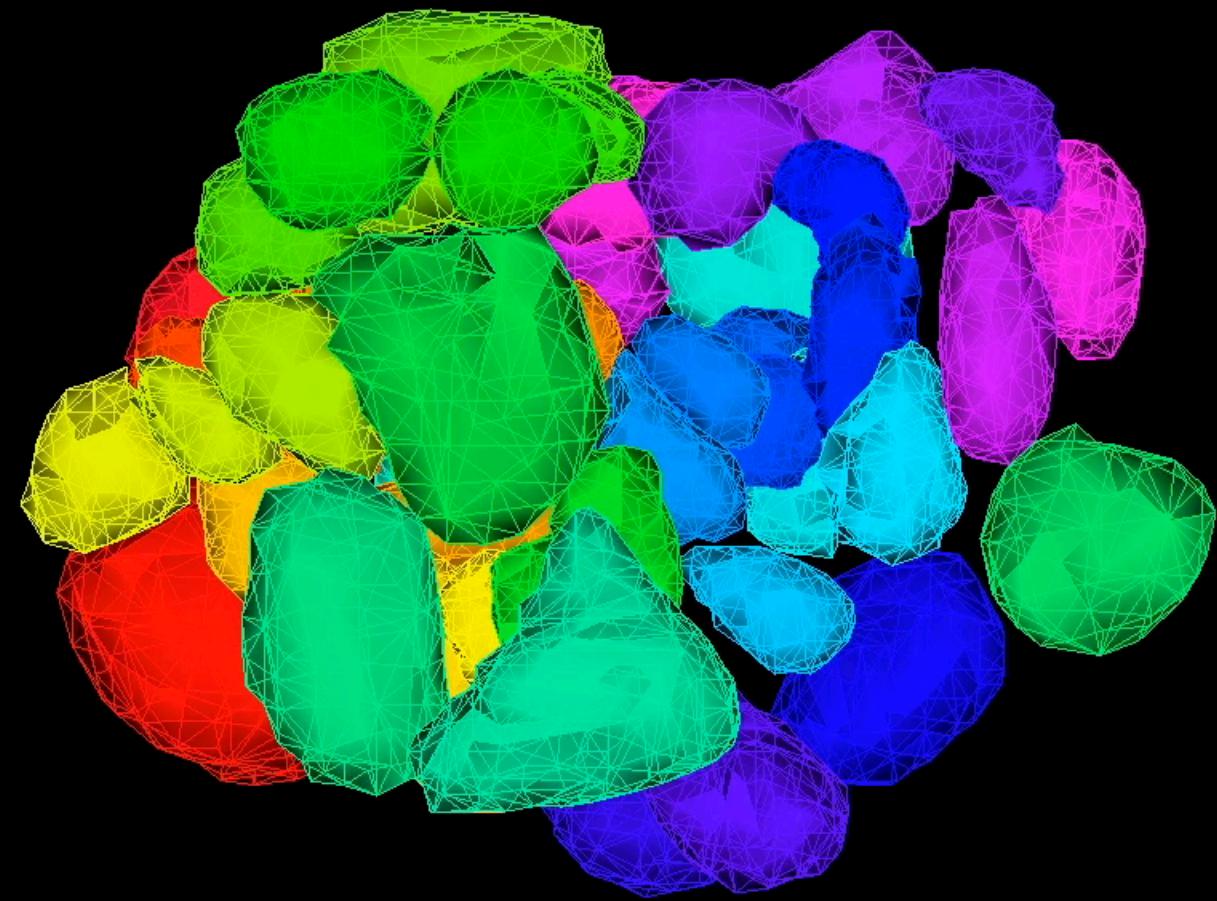
NeuroAPPS host integrated healthy and diseased models applications of the fruit fly brain. Early examples:

## 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

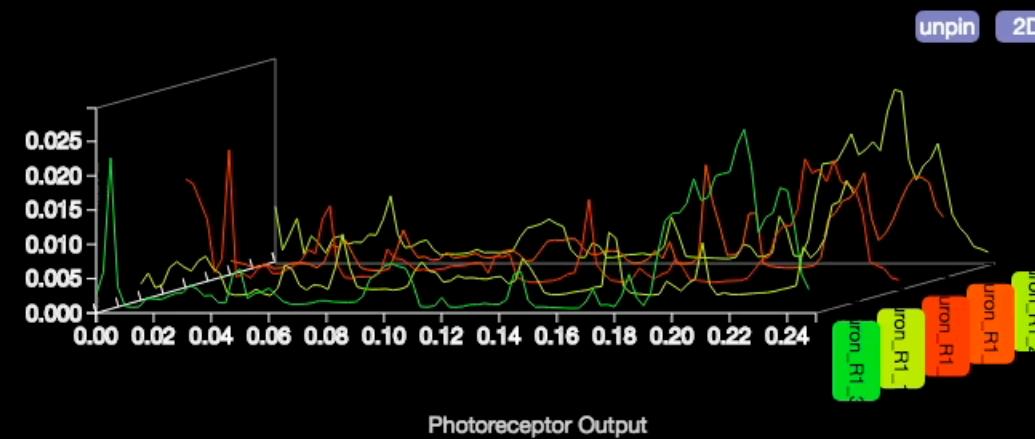
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### Parkinson's Disease: Vision

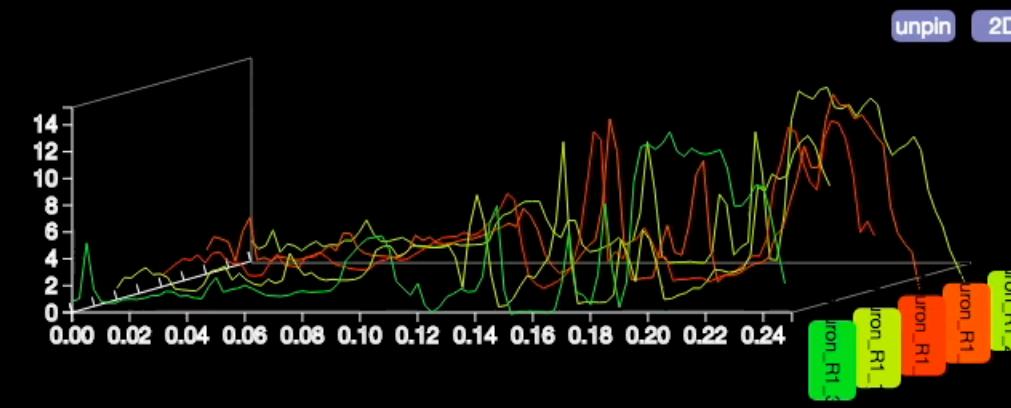
- an interactive demonstration of the poorly-understood effect of the retinal degeneration seen in Parkinson's disease.

## Parkinsons Disease Model

Photoreceptor Input



Photoreceptor Output



Natural Scene



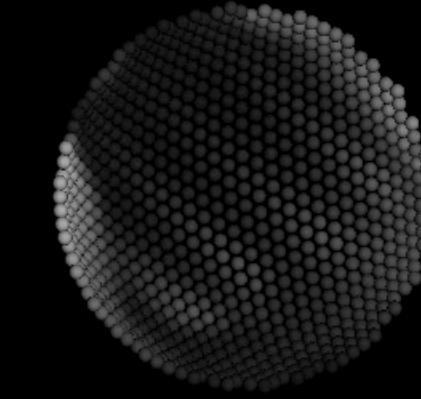
Visual Field



Healthy Retina



Diseased Retina



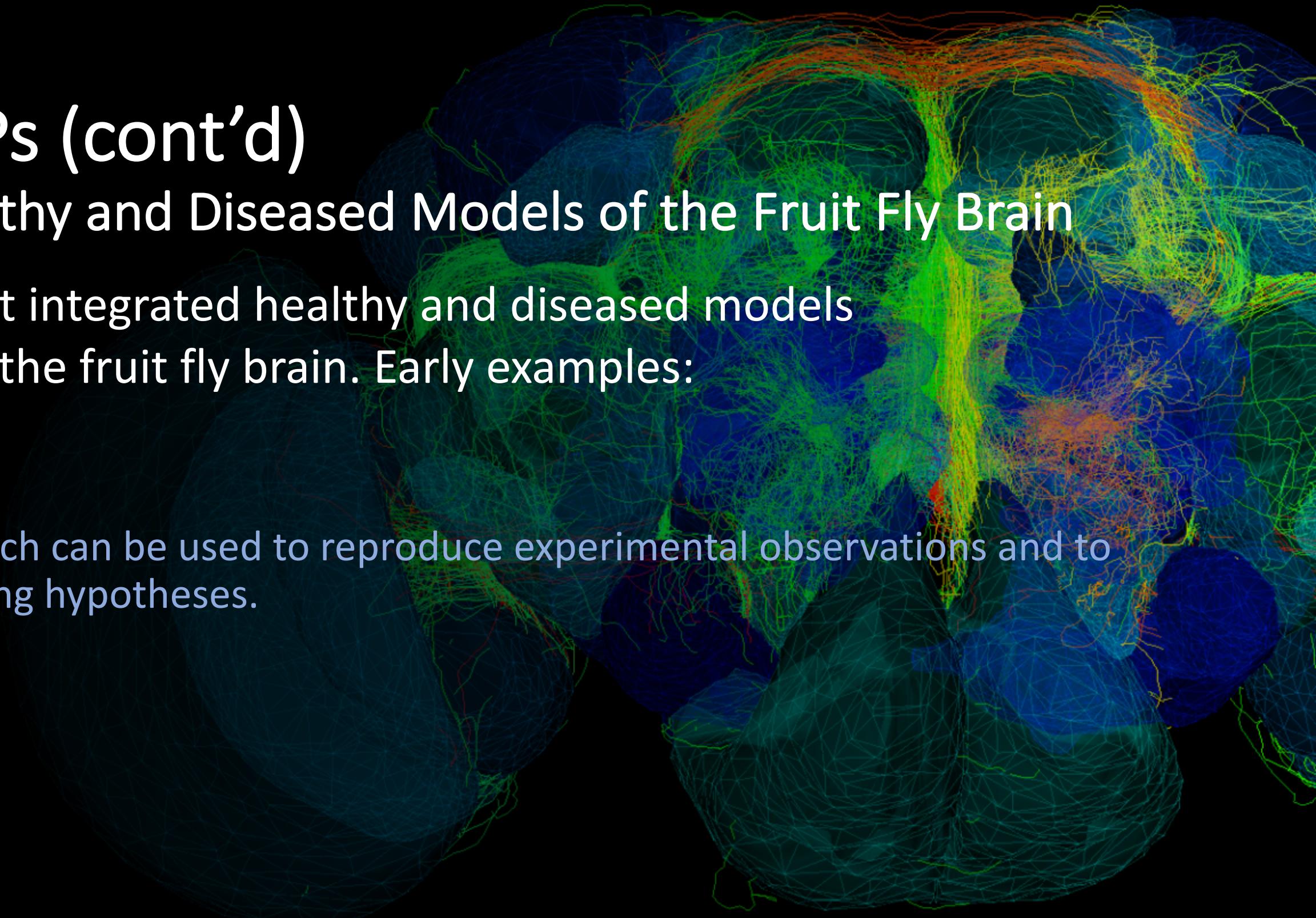
# NeuroAPPs (cont'd)

## 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:

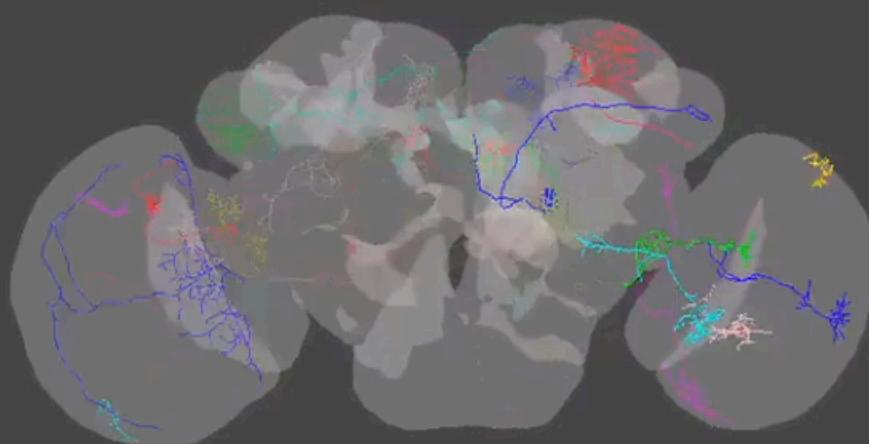
### Epilepsy Model

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



2101 ms

stimulus onset

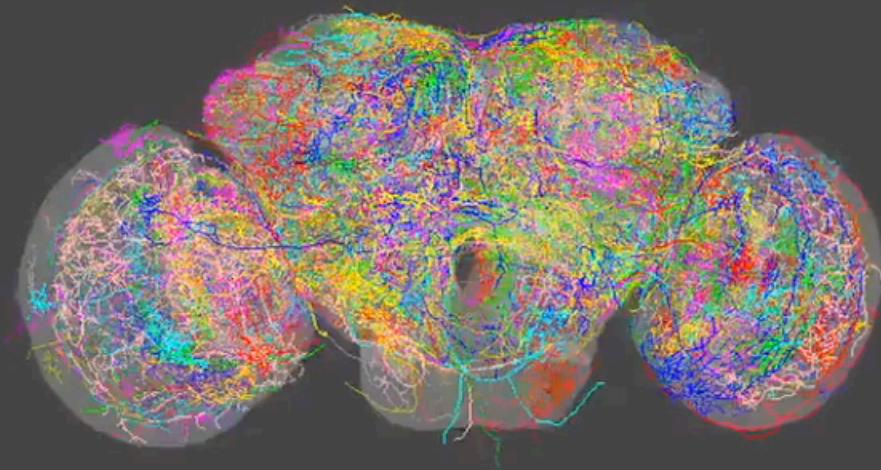


firing rate : 0.86 Hz

Healthy

2101 ms

stimulus onset

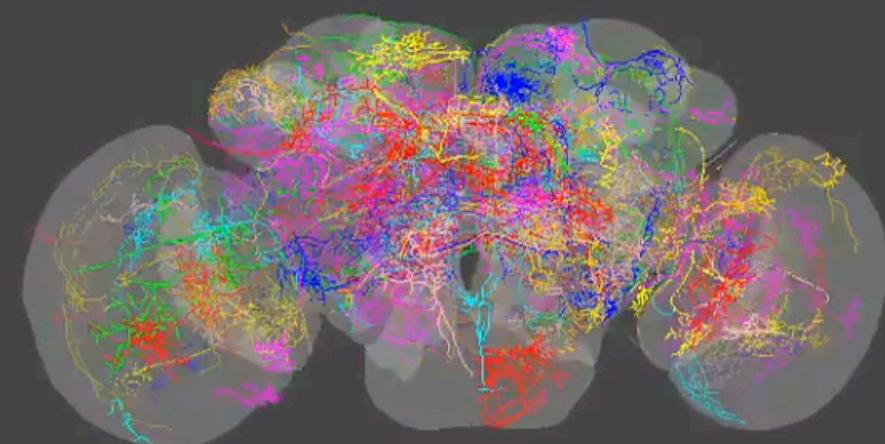


firing rate : 13.15 Hz

Epileptic

2101 ms

stimulus onset



firing rate : 6.05 Hz

Rescued

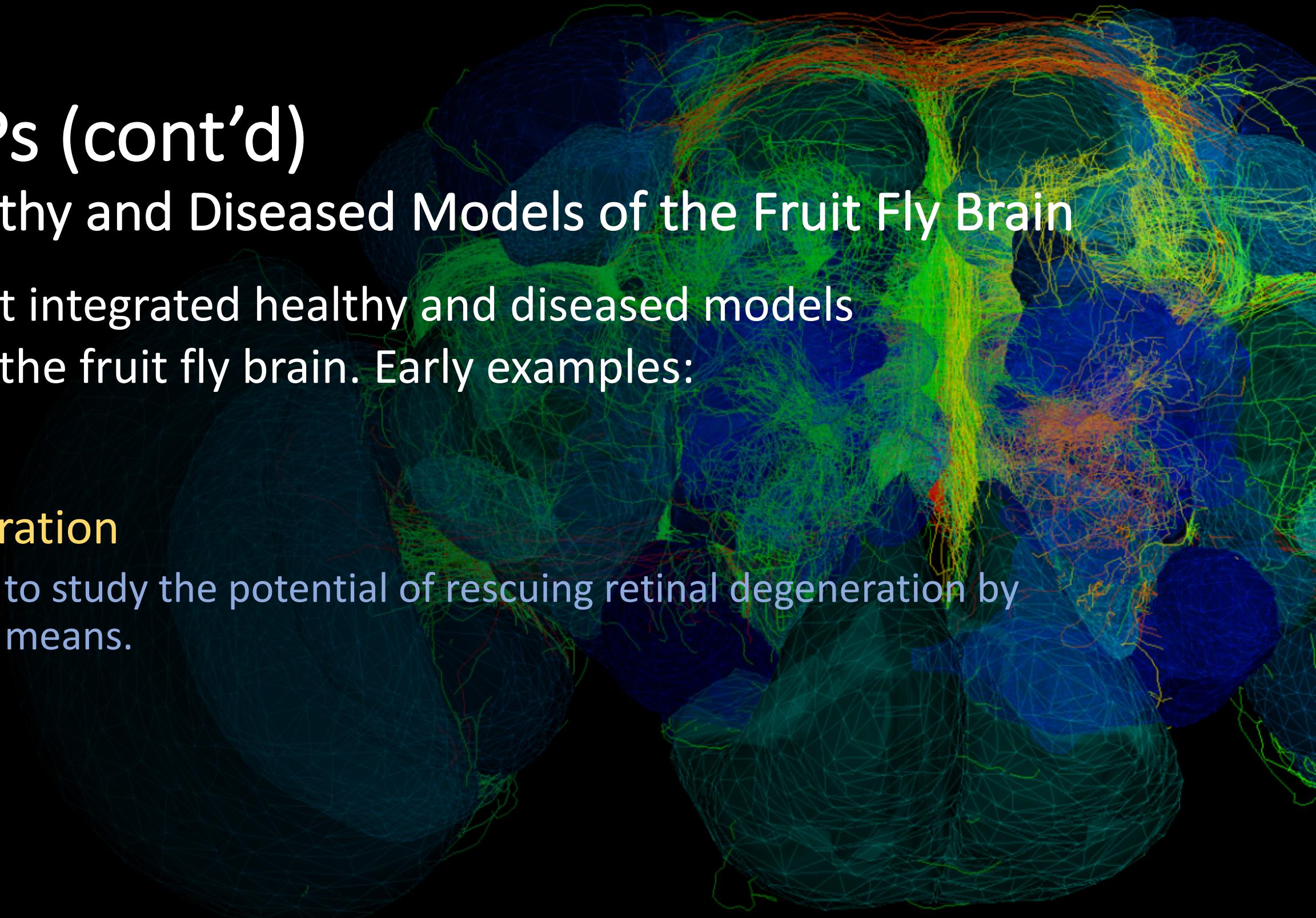
# NeuroAPPs (cont'd)

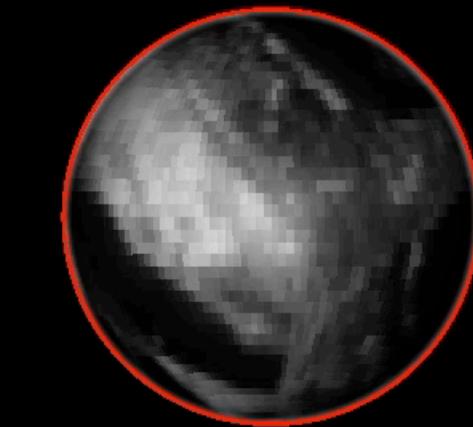
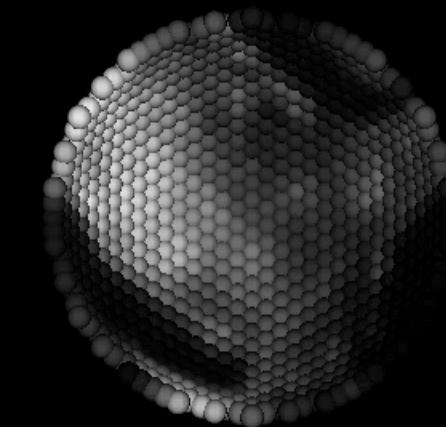
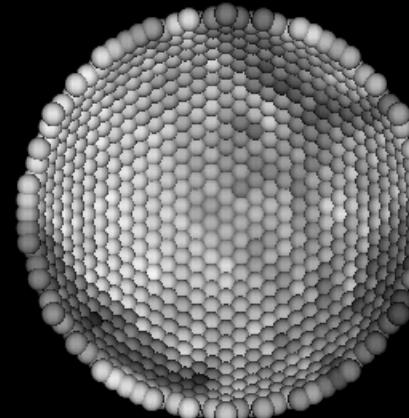
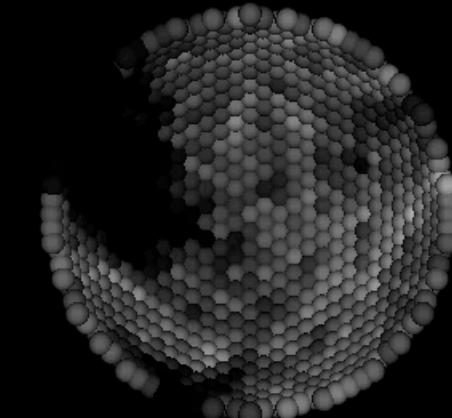
## Apps for Healthy and Diseased Models of the Fruit Fly Brain

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**