

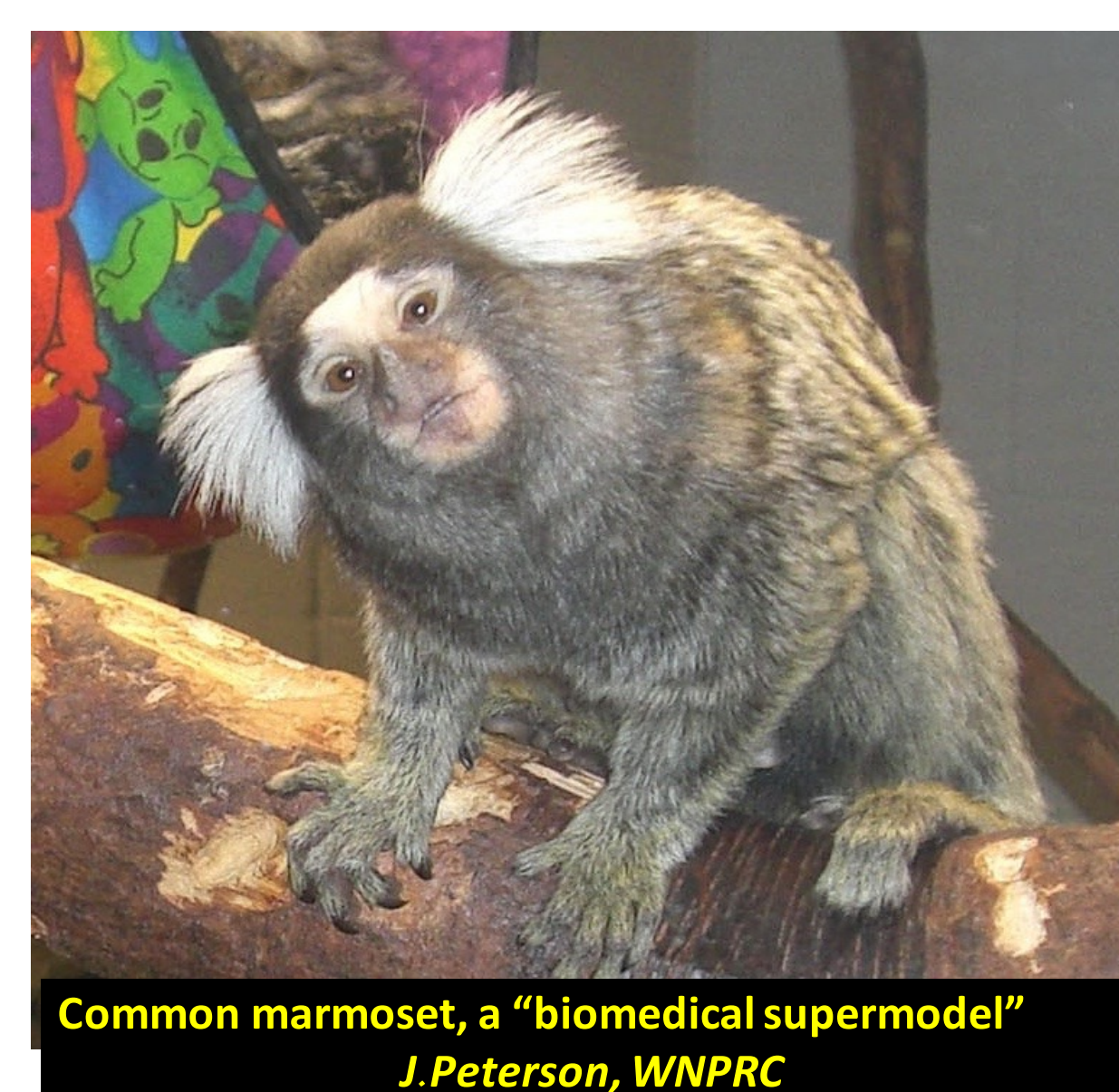


## Evaluating the Effects of Exercise in a Monkey Model of Multiple Sclerosis (MS) “Take the Monkey and Run”

Exercise promotes increased blood flow to the brain, increased brain volume, and increased neurogenesis and neurotropic factors such as brain-derived neurotrophic factor (BDNF). While there is increased interest in the potential benefits of exercise to the diseased brain, we simply do not know the benefits and potential harm exercise might have to an individual with MS.

### How can marmosets help us understand human behavior and disease?

- 95% of genes shared with humans
- Small enough to work with safely, efficiently and effectively in a lab environment.
- The marmoset model reflects more closely the clinical, anatomical, and neuropathological aspects of MS than any of the other current models.



### Developed a paradigm for safely and effectively engaging marmoset monkeys in exercise.

- We only used **positive reinforcement**.
- We trained marmosets to willingly enter a transport container.
- We trained marmosets to then willingly enter the exercise ball.
- We gradually habituated each marmoset to increased speed and duration on the treadmill.
- Marmosets ran on the treadmill for 30 minutes, 3 times a week.



### Research laid the foundation for long-term studies of the scientific basis for exercise as a potential treatment for MS.

- We are currently determining if exercise has neuroprotective effects on disease progression and cognition in the marmoset model for MS.
- We are investigating the signaling pathways of BDNF in exercising marmosets.

