Fred H. Gage & Henriette Van Praag Study, 1999

• Explored the question: whether the BDNF that exercising animals produced has similar effects on neurons in their brains.

1999 a study of two groups of mice:

– One group had a running wheels

– One group did not.

- Mice with wheels ran 4 to 5 kilometers every night.

Findings:

• The runners had twice as many new brain neurons as the sedentary mice did.

• They discovered that neurons taken from the runners showed greater signs of strength and connections and cellular learning.

Gage 2004

• On average the runners voluntarily racked up 48 km per day over several weeks. (11 rats **averaging** 29 miles/day)

• The runners had more new neurons and stronger connectivity: this is key evidence for learning and that was not evident in the rats brains that had no wheel.

• Messenger RNA of both groups, an indicator gene expression, found that the running rats had consistently high activity in the gene that codes for BDNF than the non runners did.