Damage to specific regions of the brain determines symptoms of Parkinson’s disease

JOHNATHAN VINKAVICH
The Brain and How it Works
The Brain and How it Works
The Brain and How it Works

A. Feedforward excitation

B. Feedforward inhibition

C. Convergence/divergence

D. Lateral inhibition

E. Feedback/Recurrent inhibition

F. Feedback/Recurrent excitation
The Brain and How it Works
The Brain and How it Works

MOVEMENT
The Brain and How it Works
The Brain and How it Works
Parkinson’s Disease

Stooped posture
Shaky hands
Parkinson’s Disease

MOTOR SYMPTOMS

- Tremor
- Bradykinesia (slowness)
- Rigidity
- Poor Balance
Parkinson’s Disease

Substantia nigra, dopamine-producing cells

Parkinson's disease

http://41.media.tumblr.com/bvntkkvve0t4k871kkkkkkk_500.jpg

Parkinson’s Disease

FEWER PEOPLE HAVE LOOKED AT THE VTA AND ITS OUTCOMES
# Parkinson’s Disease

<table>
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<th>MOTOR SYMPTOMS</th>
<th>MOOD SYMPTOMS</th>
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Parkinson’s Disease

**MOTOR SYMPTOMS**

- Tremor
- Bradykinesia (slowness)
- Rigidity
- Poor Balance

**MOOD SYMPTOMS**

- Sadness
- Loss of Appetite
- Apathy
- Depression
What I Did
What I Did

6-OHDA/AA
What I Did
What I Did
What I Found: Lesions

![Graph showing TH+ Cell Count for Sham, Partial, and Lesion groups.]

- Sham: Large bar indicating higher TH+ cell count.
- Partial: Medium bar showing moderate TH+ cell count.
- Lesion: Smaller bar with the lowest TH+ cell count.

Legend:
- SNC
- VTA
What I Did
What I Found: Step Test

![Graph showing TH+ Cell Count vs Mean Steps with Lesioned Side]

- $R^2 = 0.63771$
- $R^2 = 0.7374$
What I Found: Step Test

![Graph showing the relationship between TH+ Cell Count and Mean Steps with Lesioned Side. The graph includes two lines with corresponding R² values: R² = 0.64793 and R² = 0.85194.]
What I Did
What I Found: Cylinder Test

L/R Paw Touches in 5 min Cylinder Test

TH+ Cell Count

R² = 0.51059
R² = 0.434
What I Found: Cylinder Test

![Graph showing the relationship between TH+ Cell Count and L/R Paw Touches in 5 min Cylinder Test.](image)

- Right Preference
- No Preference
- Left Preference

$R^2 = 0.51059$

$R^2 = 0.434$
What I Expected

Step Test: $SN_c > VTA$

Cylinder Test: $SN_c < VTA$
What I Found

Step Test  \( SNc < VTA \)

Cylinder Test  \( SNc = VTA \)
What I Found

“"It’s not that they can’t step,

it’s that they don’t want to""
Thank You To the Following

**RFUMS**
- Anthony West
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- Voctoia Hoch
- Kuei Tseng
- Adriana Caballero
- Ashwin Iyegar
- Geeta Verma

**LFC**
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- Lynn Westley
- Doug Light
Questions?