Introduction to Bioelectricity

Week 5: Applications of bioelectricity
Lecture 5.1: Parkinson's disease

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Week 5: Applications of bioelectricity

• Lecture 5.1: Parkinson's disease
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• Simple neural circuits:

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*Image and diagram from NEUROSCIENCE 5e, Figure 1.7 (Part 1)*

Lecture 5.1: Parkinson's disease

• Gross anatomy

[Diagram of brain anatomy with labels and images of brain sections]
Lecture 5.1: Parkinson's disease

• Neuronal diversity

![Diagram of neuronal diversity and brain regions including Caudate, Medium spiny neuron, Putamen, External and Internal Globus pallidus, Substantia nigra pars reticulata, and Cortical pyramidal neurons.](NEUROSCIENCE 5e, Figure 18.3)
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- A neural circuit

![Diagram of neural circuit showing interactions between Striatum, Globus pallidus, Motor cortex, and VA/VL complex of thalamus.]

*NEUROSCIENCE 5e, Figure 18.5*  
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- **Direct pathway**
  
  (A) Direct pathway

  ![Diagram of the direct pathway in Parkinson's disease]

  - Substantia nigra pars compacta
  - Caudate/Putamen
  - Globus pallidus, internal segment
  - VA/VL complex of thalamus
  - Frontal cortex

  **Neuroscience 5e, Figure 18.7 (Part 1)**
  
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- **Indirect pathway**
  
  (B) Indirect and direct pathways

- Substantia nigra pars compacta
- Cerebral cortex
- Frontal cortex
- VA/VL complex of thalamus
- Globus pallidus, external segment
- Globus pallidus, internal segment
- Subthalamic nucleus

*NEUROSCIENCE 5e, Figure 18.7 (Part 2)*
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- Histology

(A)

Parkinson’s

Normal

NEUROSCIENCE 5e, Figure 18.9 (Part 1)
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- Parkinson's disease
  (A) Parkinson's disease (hypokinetic)

![Diagram of Parkinson's disease](image)

*NEUROSCIENCE 5e, Figure 18.10 (Part 1)*
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- Deep brain stimulation (DBS)
Lecture 5.1: Parkinson's disease

• Clinical demo (youngandshaky.com)