2学分生理学
考试时间：8：30-10：30；12/28/2021（周二）
地点：二教306
考试方式：可带一张正反面有文字内容的A4纸。
试题类型：简答题和名词解释（满分100）
试题分数分配：王世强/罗金才/罗冬根 = 35/25/40
考试范围：所有课堂内容

3学分生理学
考试时间：8：30-9：30；12/28/2021（周二）
地点：二教319
考试方式：可带一张正反面有文字内容的A4纸。
试题类型：简答题（满分100分）
考试范围：内分泌和神经生理学的课堂内容

答疑
罗金才老师：上午8：30-11：30；下午13：30-16：30； **12/27（周一）；** 设备2号楼248室
罗冬根老师：下午5：30-7：30； **12/26（周日）；** 吕志和楼406室
王世强老师：下午2：30-4：30； **12/27（周一）；** 生科金光楼113室

2021 Fall “Physiology”

Movement and Brain

Dong-Gen LUO

College of Life Sciences

Escaping Behaviours

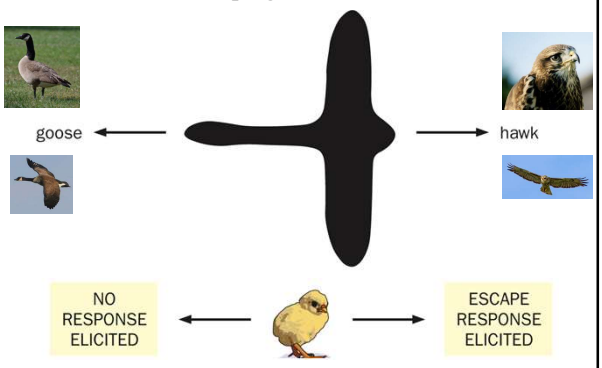
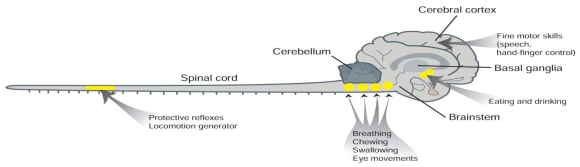
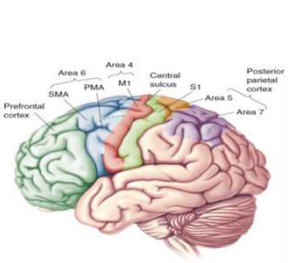


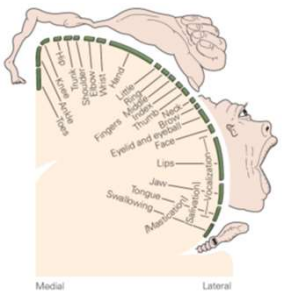
Figure 1-4 Principles of Neurobiology (© Garland Science 2016)

Somatic Motor System

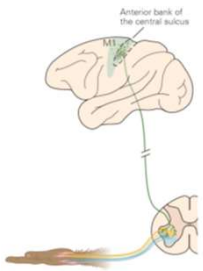


Motor Cortex

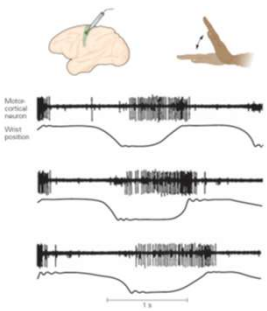




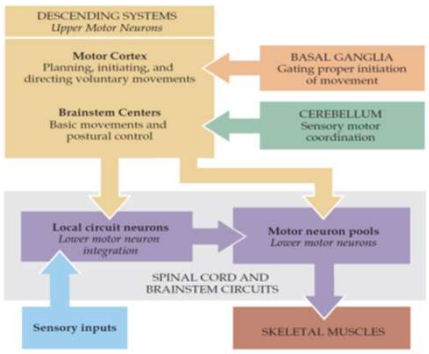
Motor Cortex



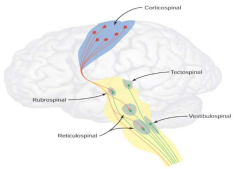
Motor Cortex Neuron Controlling Wrist Extension



Movement: Organization of Neural Control

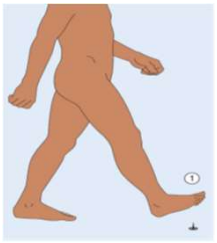


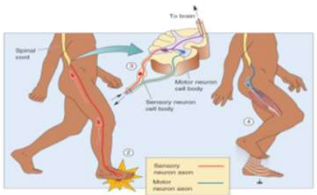
Descending Pathways



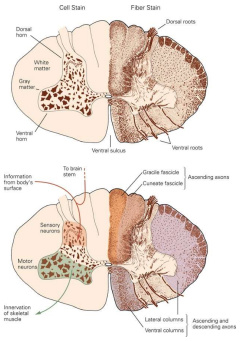
Corticospinal tract: 皮质脊髓束 （躯干、四肢）
Rubrospinal tract: 红核脊髓束 （精细手指运动）
Reticulospinal tract: 网状脊髓束 （维持姿势）
Tectospinal tract: 顶盖脊髓束 （协调头和眼球运动）
Vestibulospinal tract: 前庭脊髓束 （平衡、姿势反射）

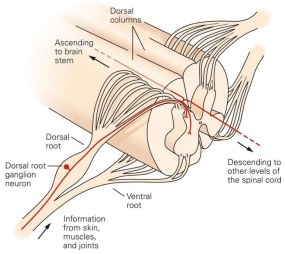
Spinal Cord



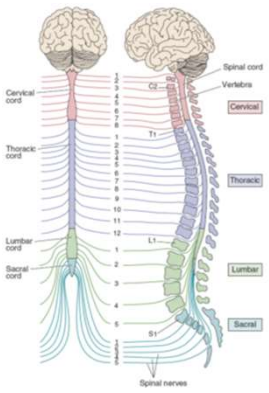


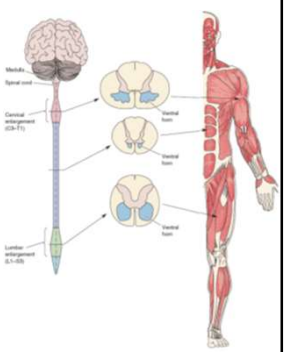
Spinal Cord and Its Roots



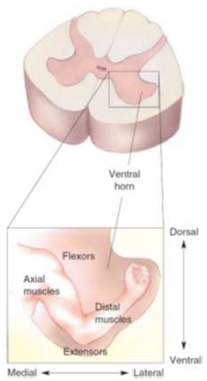


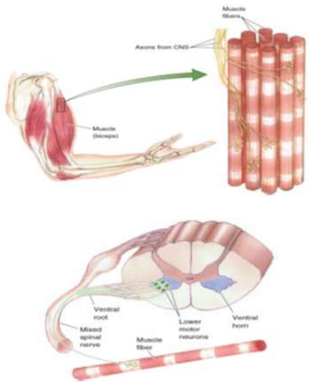
Spinal Cord: Distribution of Motor Neurons



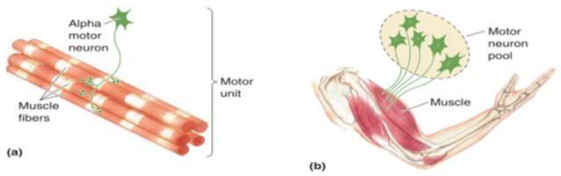


Movement Control: Spinal Cord





Motor Unit and Motor Pool



Muscle Spindle and Sensory Innervation

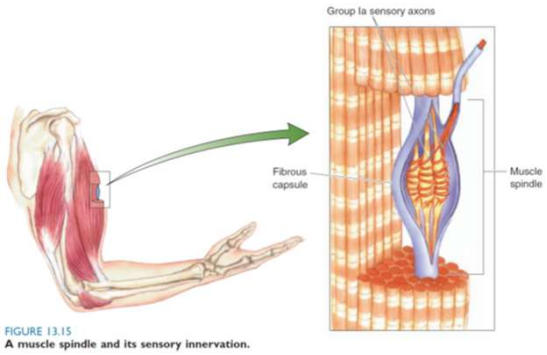
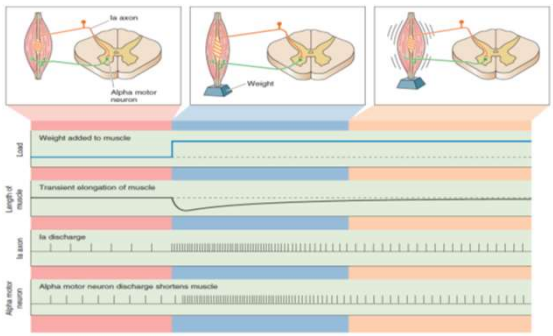
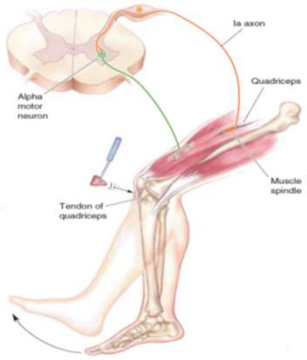


FIGURE 13.15
A muscle spindle and its sensory innervation.

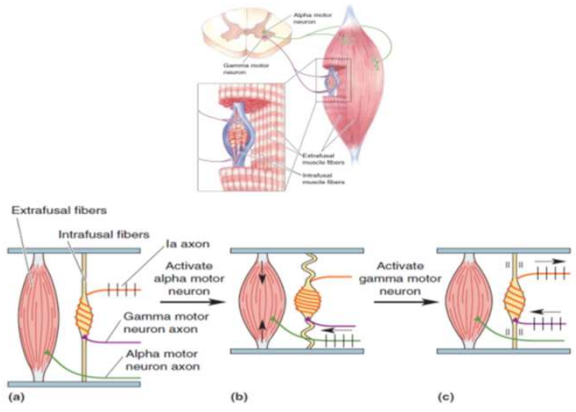
Myotatic Reflex



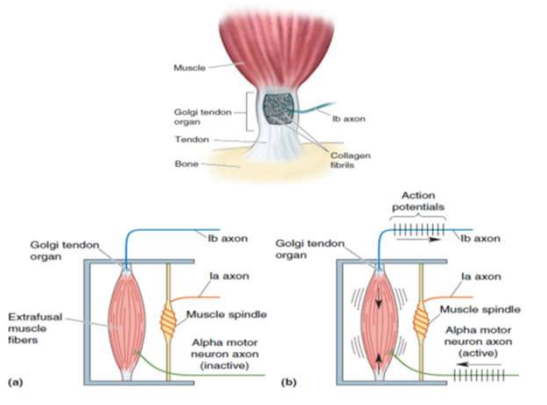
Knee-Jerk Reflex



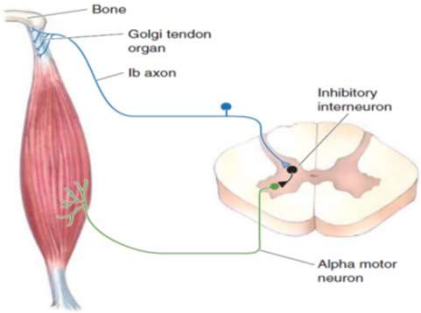
Alpha and Gamma Motor Neurons



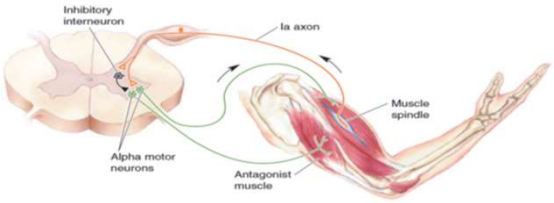
Golgi Tendon Organ



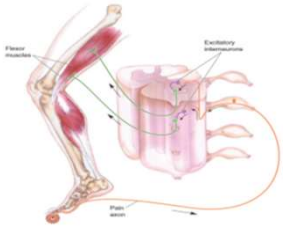
Reverse Myotatic Reflex



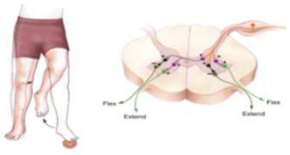
Reciprocal Inhibition: Flexor and Extensor



Flexor Reflex: excitation



Crossed Extension Reflex



Movement Control: Basal Ganglia

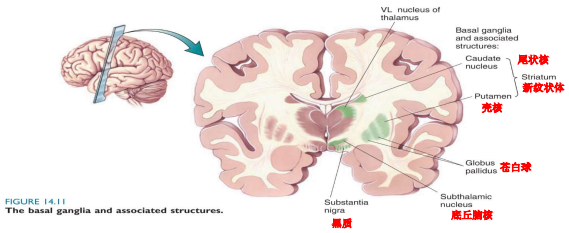
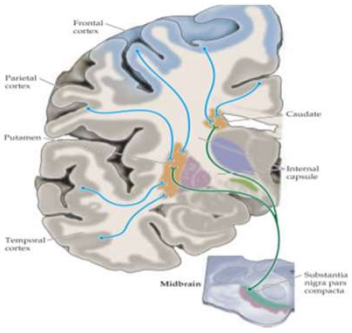
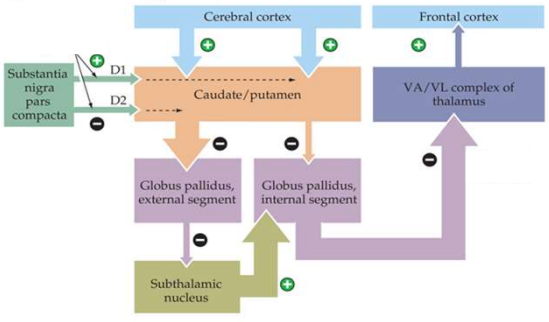


FIGURE 14.11
The basal ganglia and associated structures.

Basal Ganglia: Inputs



Basal Ganglia: Outputs



Parkinson's Disease

- Symptoms:
  - ✓ Slowness of movement
  - ✓ Difficulty in initiating willed movements
  - ✓ Increased muscle tone
  - ✓ Tremors of the hands and jaw (at rest)
  - ✓ Deficits of cognition

Huntington's Disease

- Symptoms:
  - ✓ Hyperkinesia and abnormal movements
  - ✓ Impaired cognitive abilities
  - ✓ Disorder of personality
  - ✓ Appear in adulthood (pass the gene)
  - ✓ Spontaneous, uncontrollable and purposeless movements with rapid, irregular flow and flicking motions

Basal Ganglia and Diseases

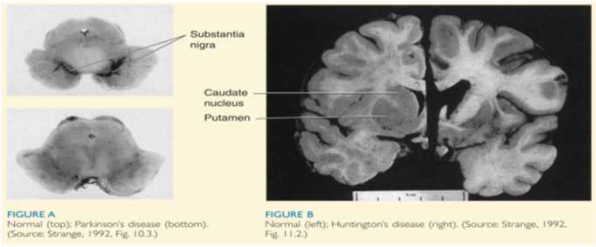
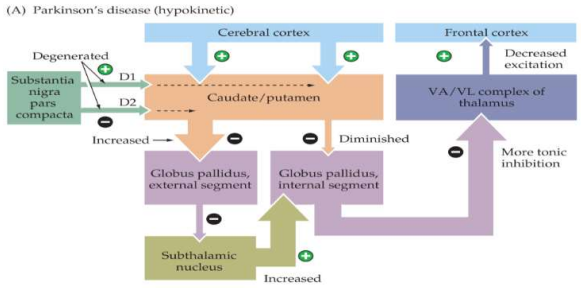


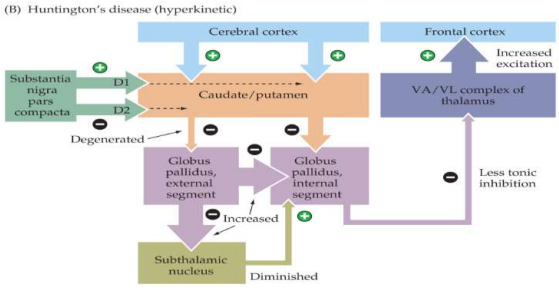
FIGURE A
Normal (top); Parkinson's disease (bottom). (Source: Strange, 1992, Fig. 10.3.)

FIGURE B
Normal (left); Huntington's disease (right). (Source: Strange, 1992, Fig. 11.2.)

Basal Ganglia and Diseases

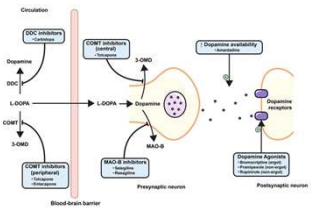


Basal Ganglia and Diseases



Parkinson's Disease Treatment

Drug Treatment



Deep Brain Stimulation