Welcome! There are 6 handouts:

- *Statistics — Overview*
- *Statistics — Tables & Formulae*
  - **correction:** p3, chi-squared test, delete "and no dramatic skew of row/column values"
- *Statistics — Handout 1*
- *Statistics — loose page 13 of Handout 1*
- *Statistics — Examples 1*
- *Introduction to Neurobiology*

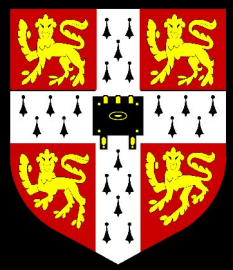
NST 1B Experimental Psychology
Practical 1

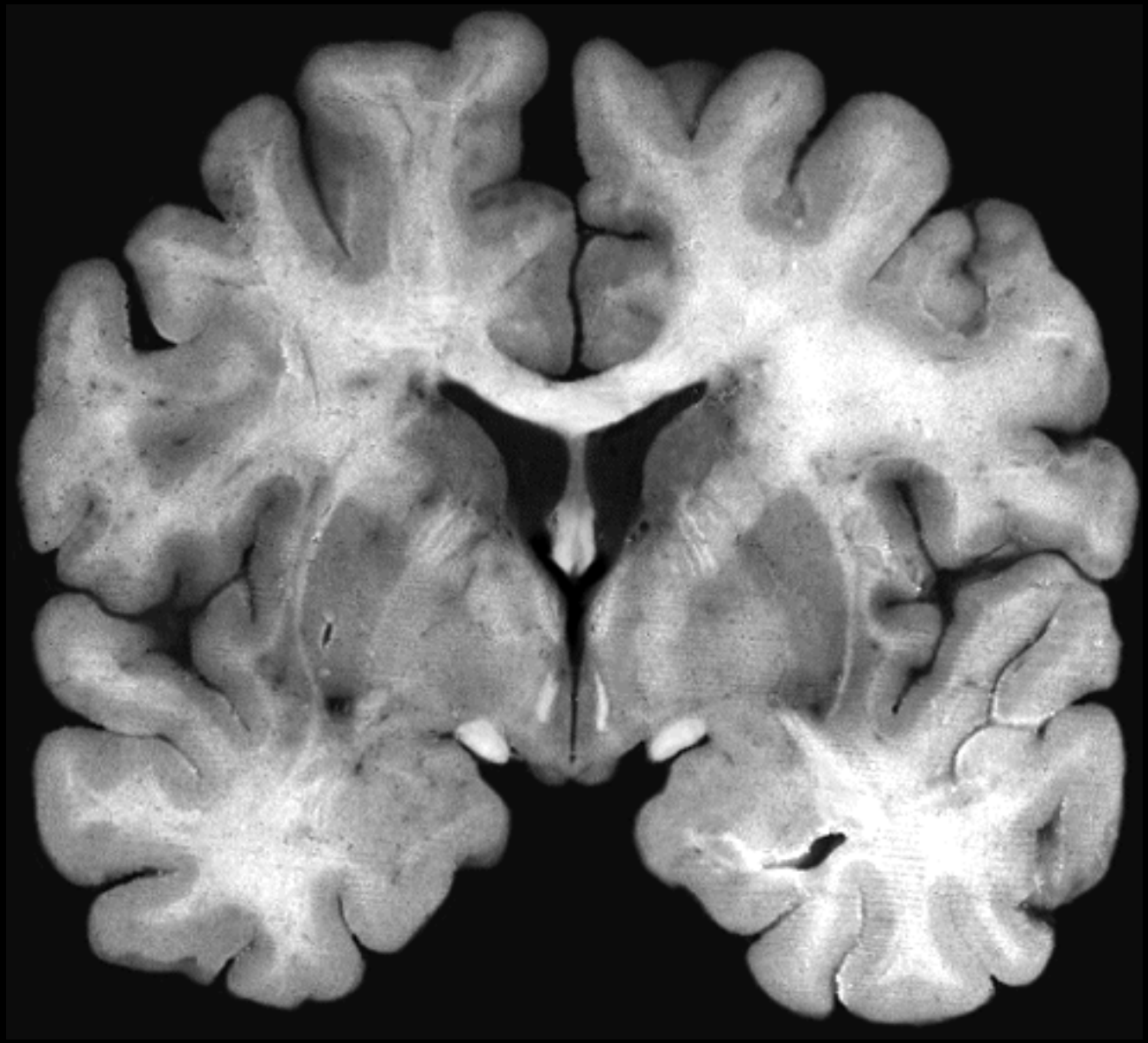
About the practical course…
About the statistics component…
and
Introduction to Neurobiology

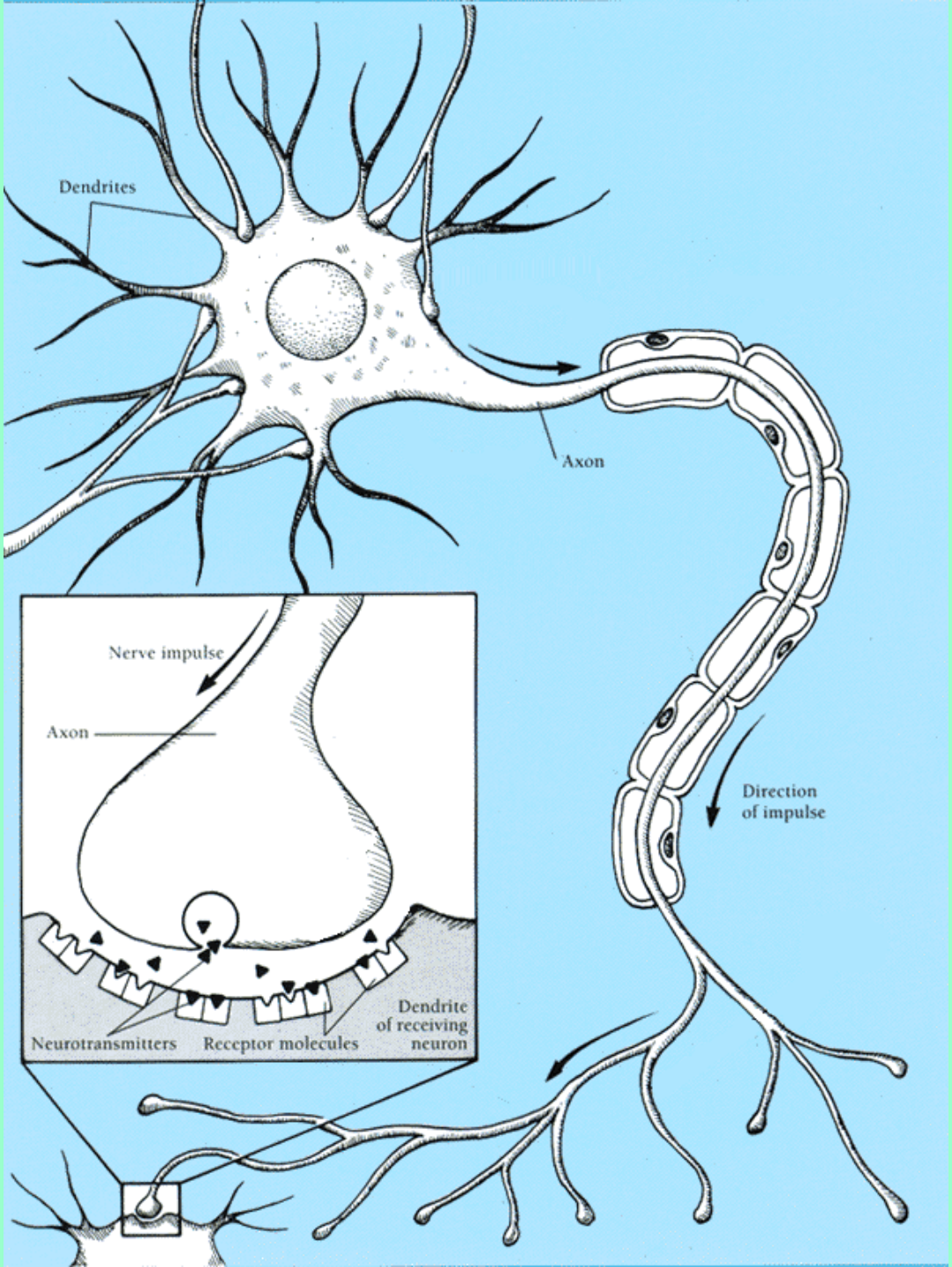
Rudolf Cardinal

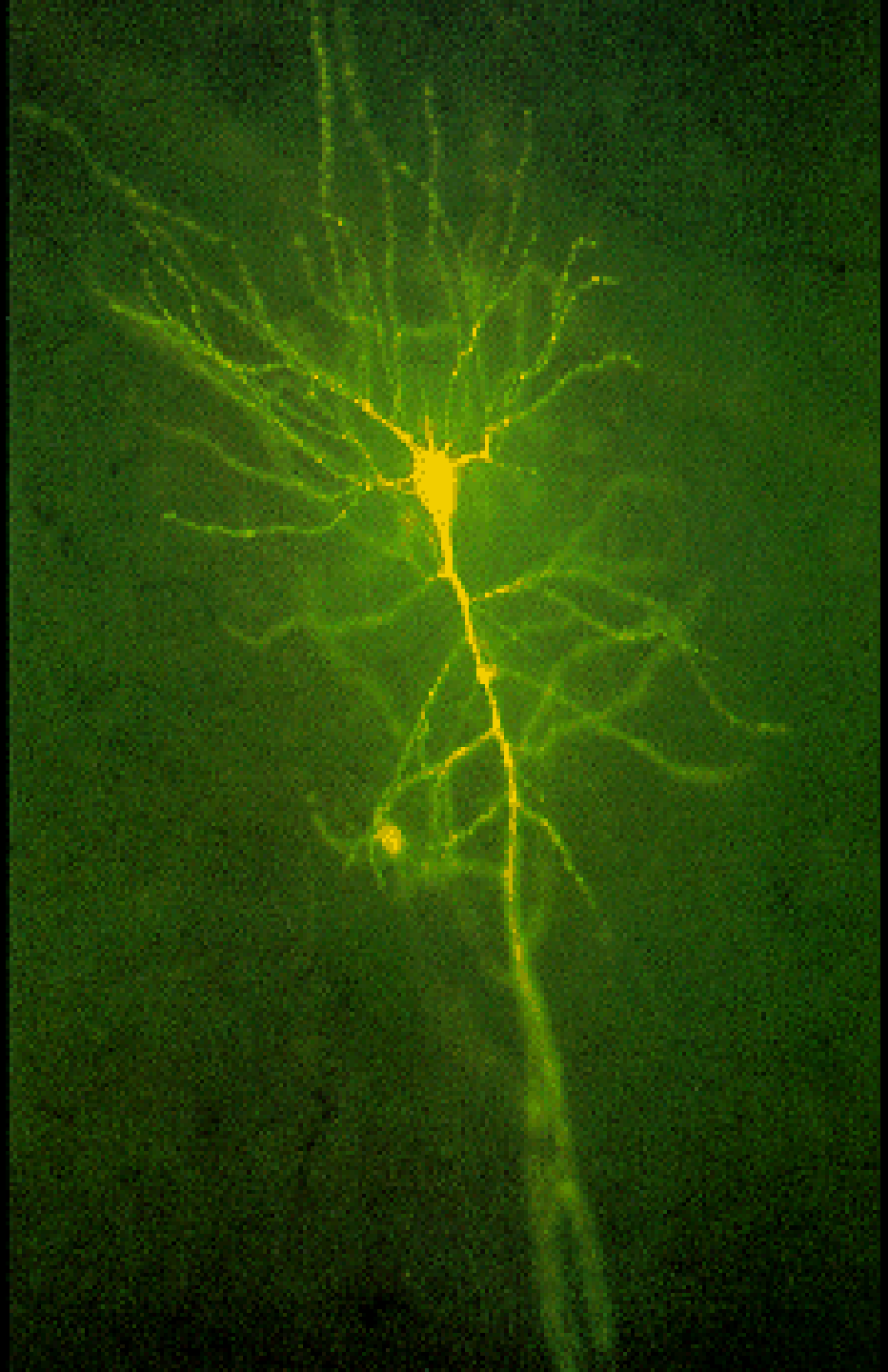
9/10 October 2003

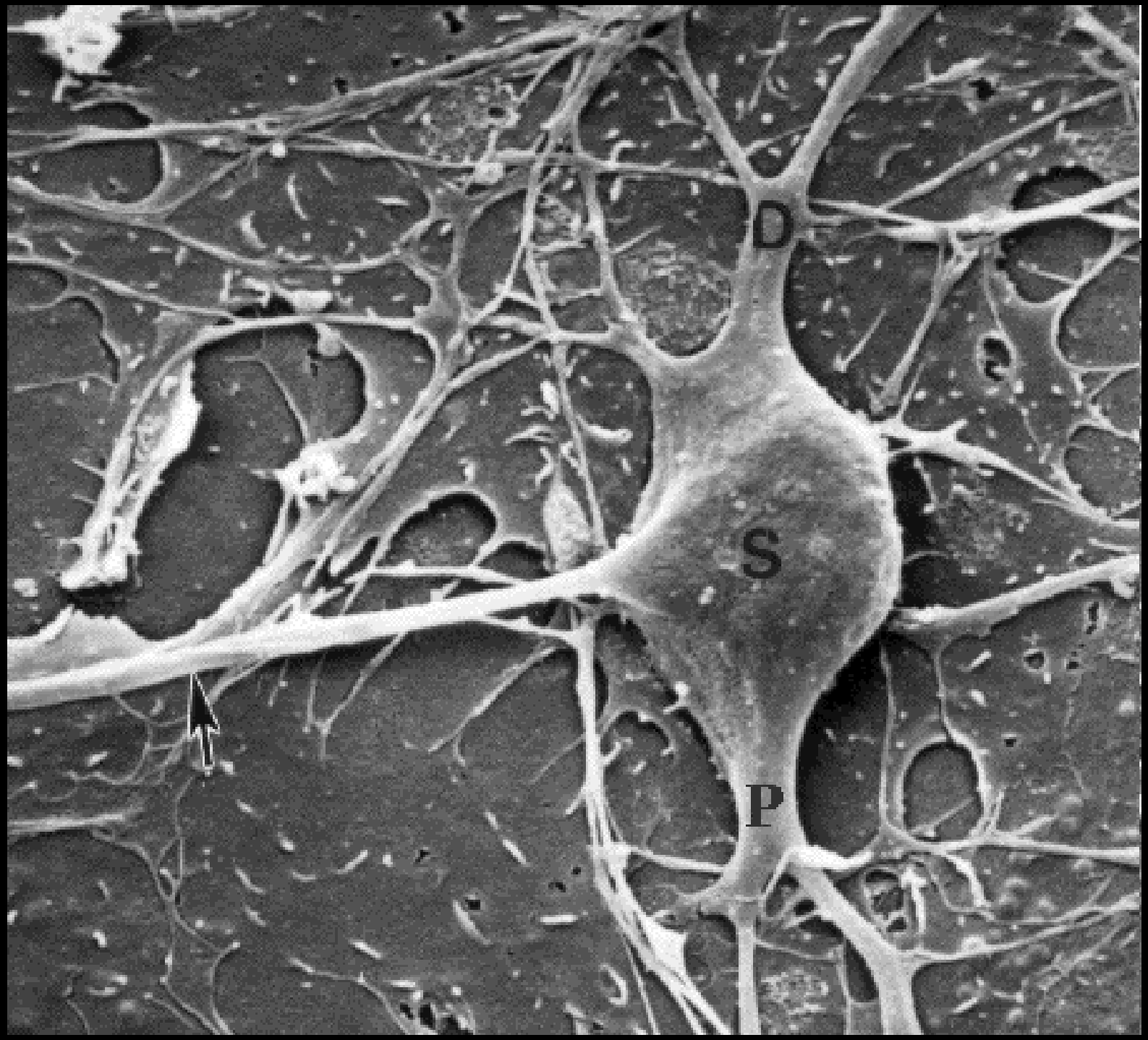
Department of Experimental Psychology
University of Cambridge






Dendrites
Axon
Nerve impulse
Axon
Direction of impulse
Neurotransmitters
Receptor molecules
Dendrite of receiving neuron

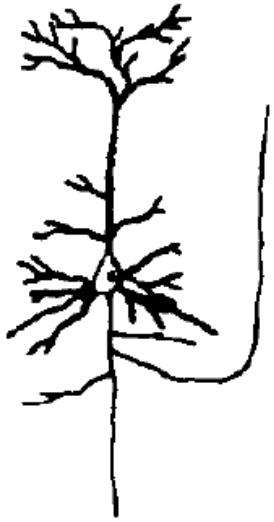



D
S
P

Dorsal root ganglion

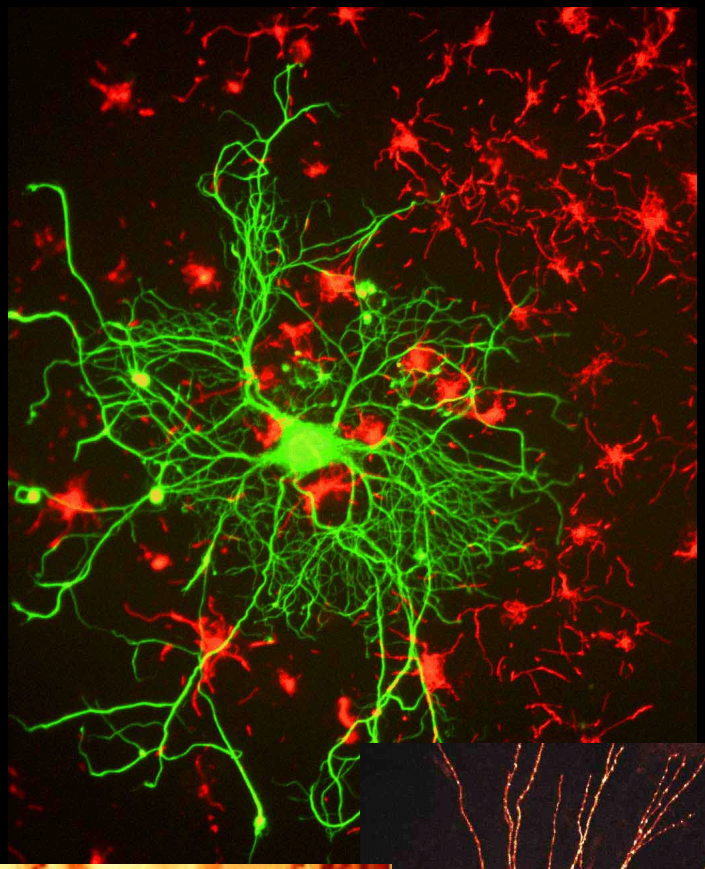
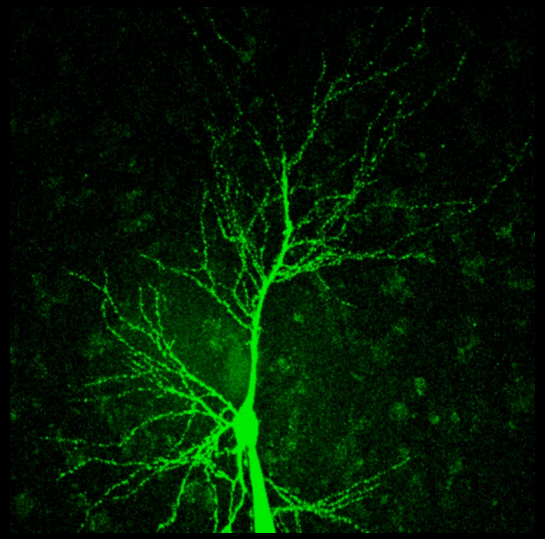
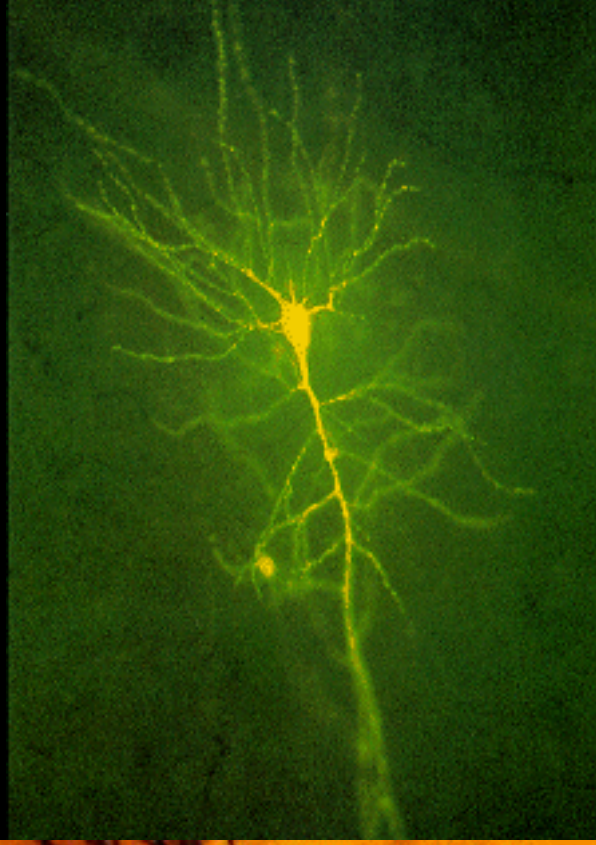
Retinal bipolar cell

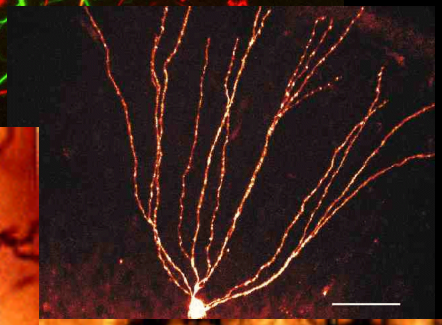
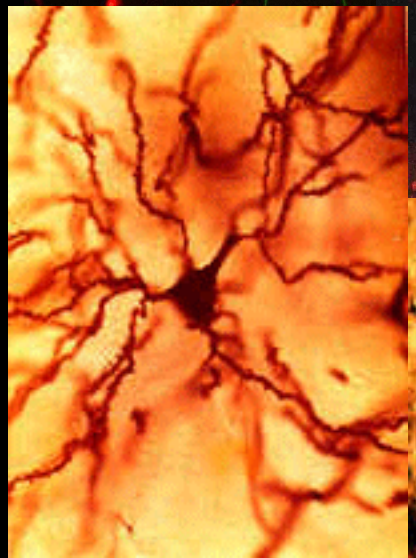
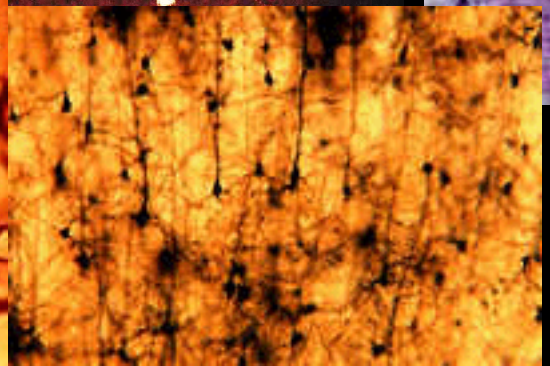
Spinal motor neuron

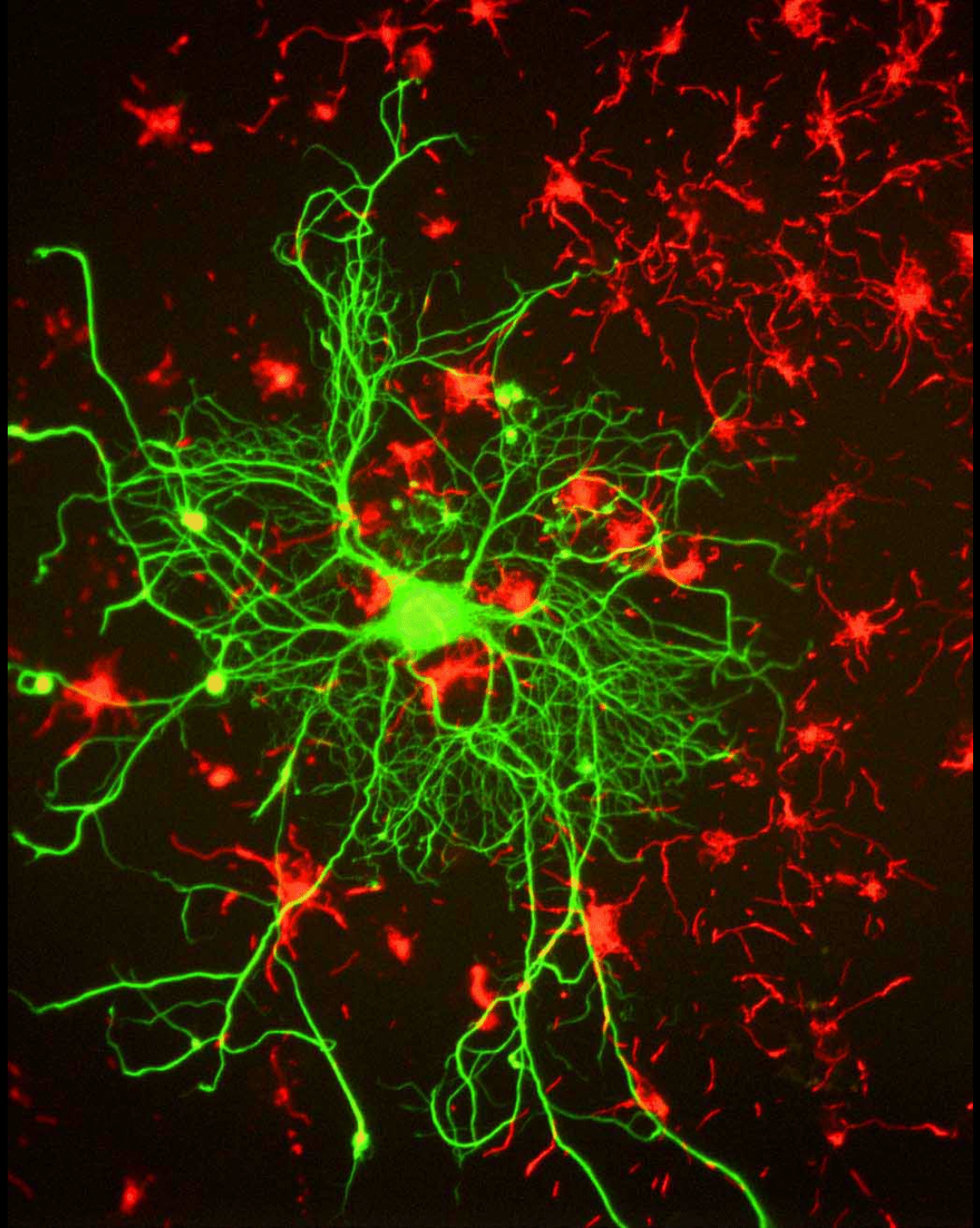


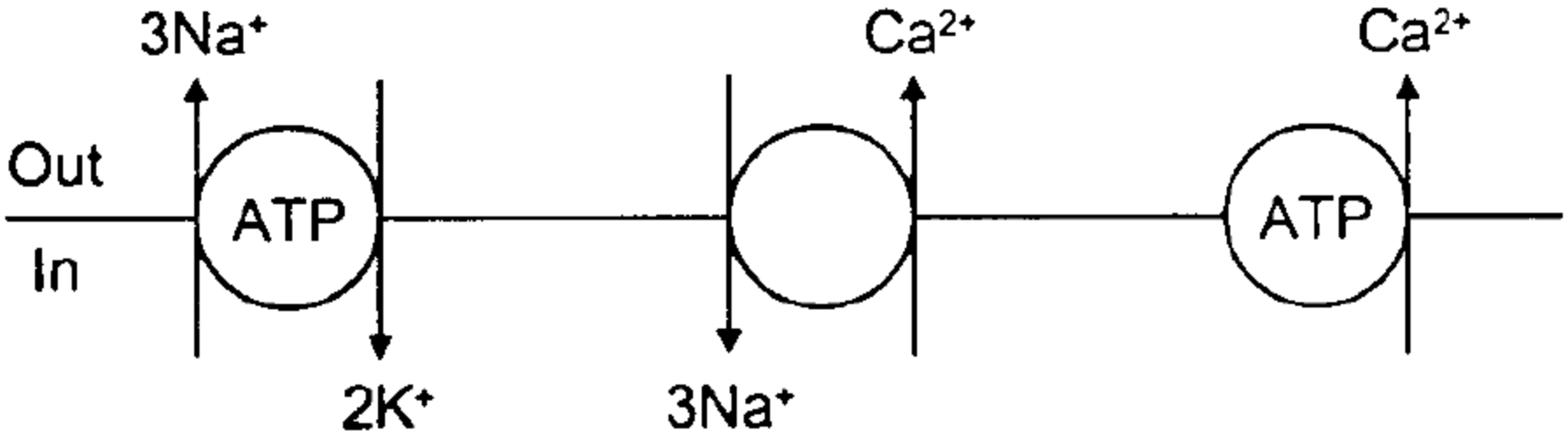
Hippocampal pyramidal cell

Cerebellar Purkinje cell

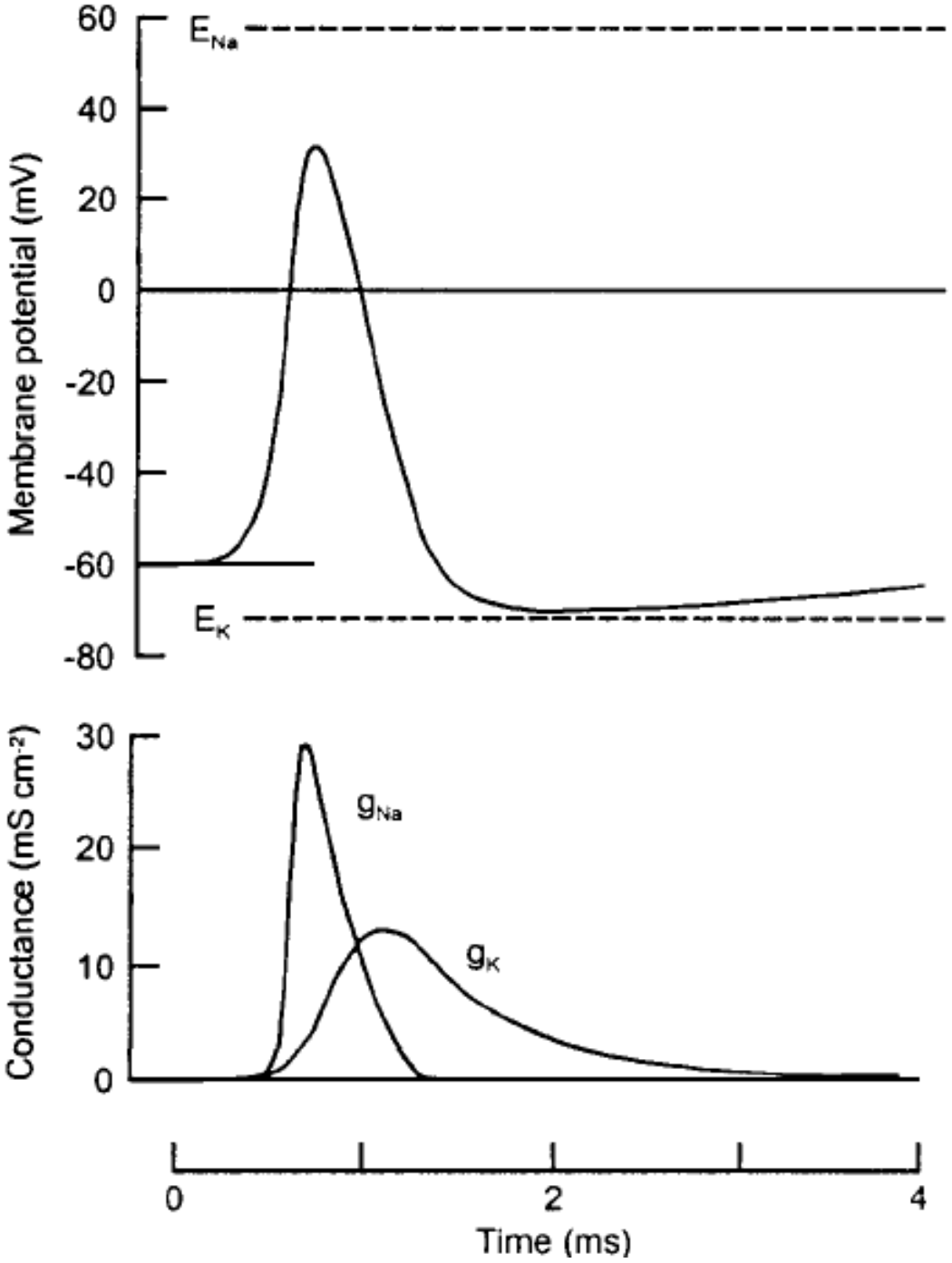




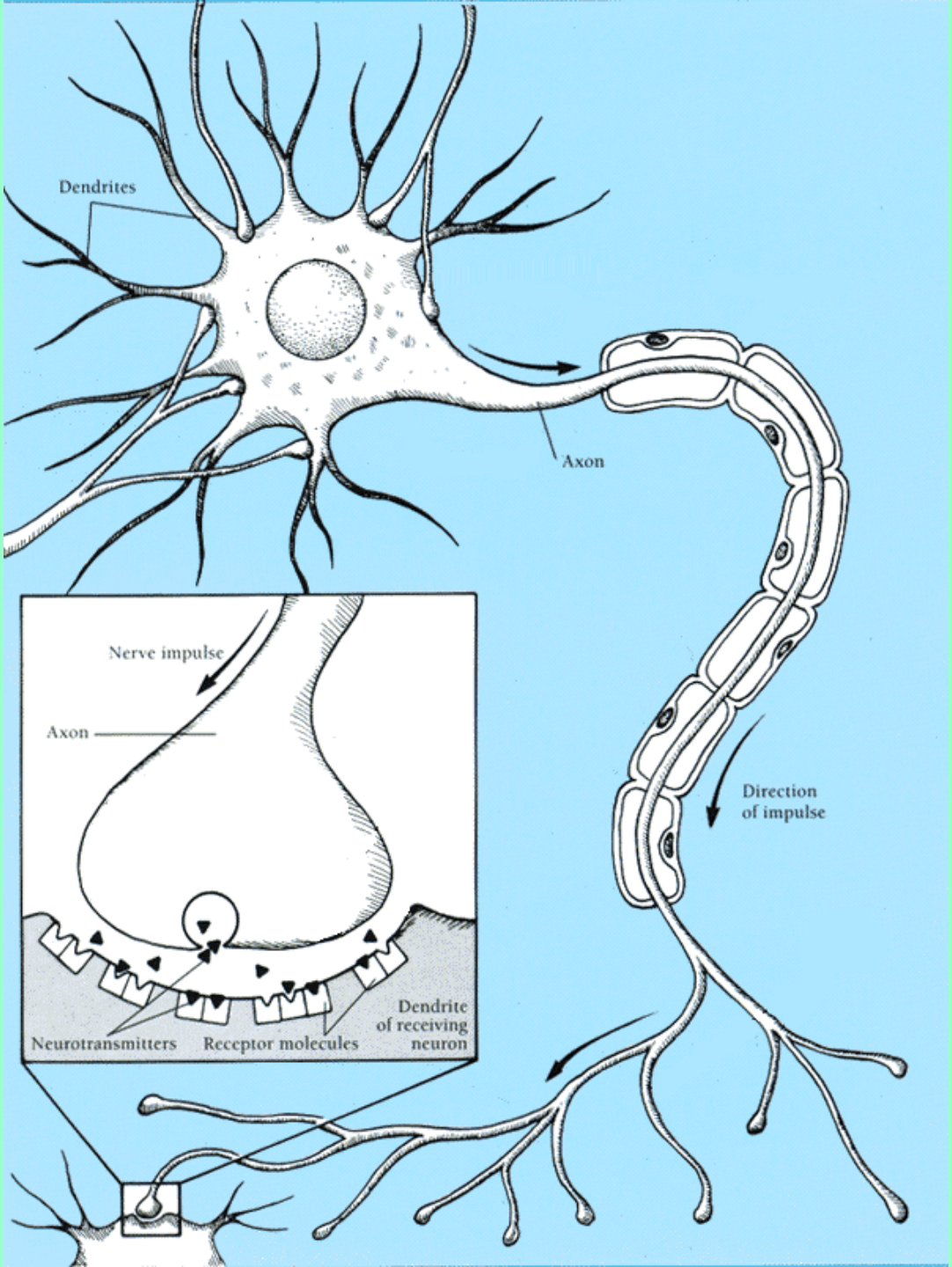




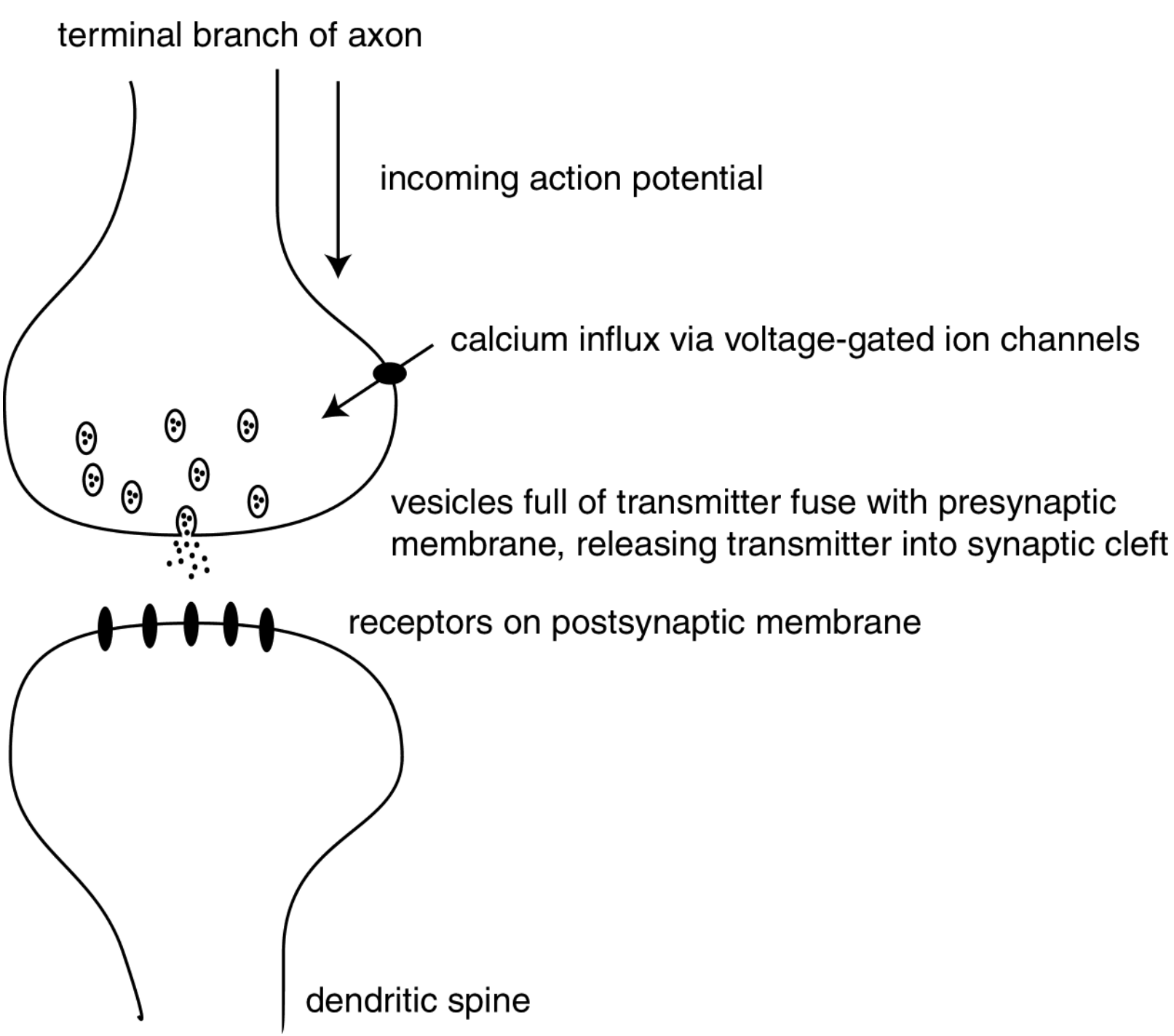





Ion	Internal concentration	External concentration	Valence (z)	Equilibrium potential
Na^+	15 mM	150 mM	+1	+62 mV
K^+	150 mM	5.5 mM	+1	-89 mV
Cl^-	9 mM	125 mM	-1	-71 mV
Ca^{2+}	10^{-4} mM	1 mM	+2	+124 mV

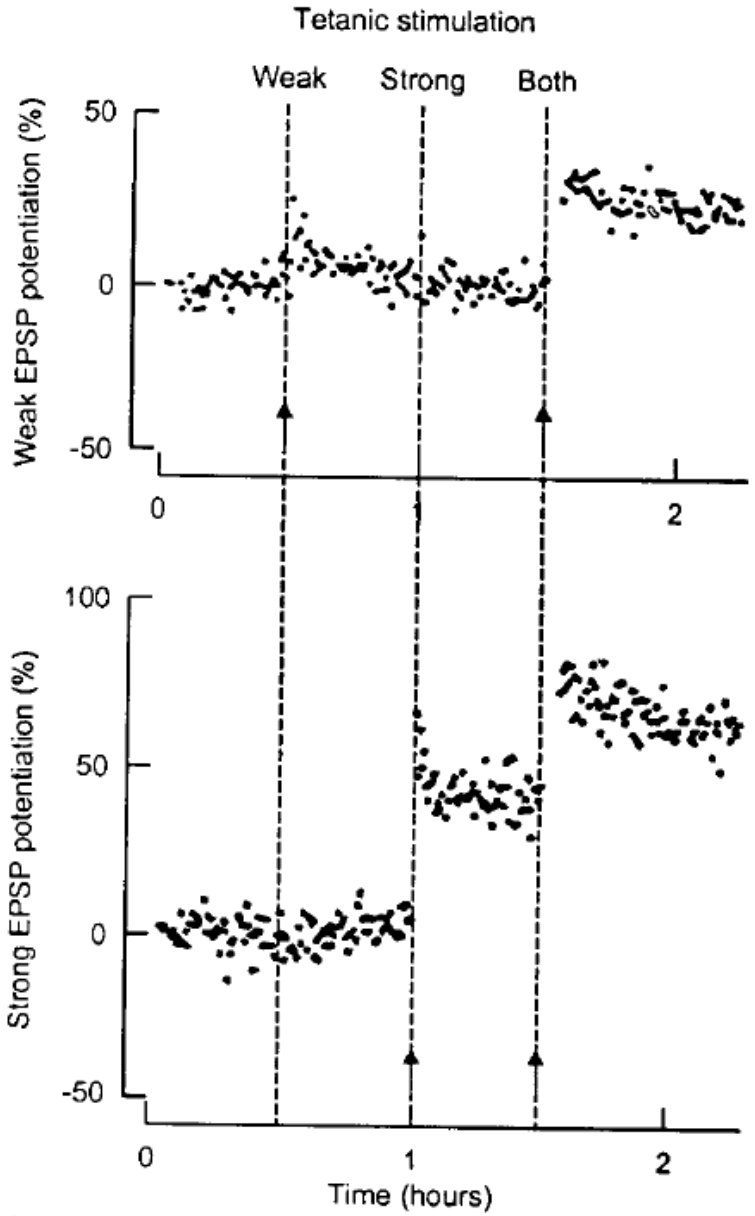

60
40
20
0
-20
-40
-60
-80
E_{Na}
E_K
Membrane potential (mV)
30
20
10
0
g_{Na}
g_K
Conductance (mS cm^{-2})
0
2
4
Time (ms)


Dendrites
Axon
Nerve impulse
Axon
Direction of impulse
Neurotransmitters
Receptor molecules
Dendrite of receiving neuron


terminal branch of axon
incoming action potential
calcium influx via voltage-gated ion channels
vesicles full of transmitter fuse with presynaptic membrane, releasing transmitter into synaptic cleft
receptors on postsynaptic membrane
dendritic spine

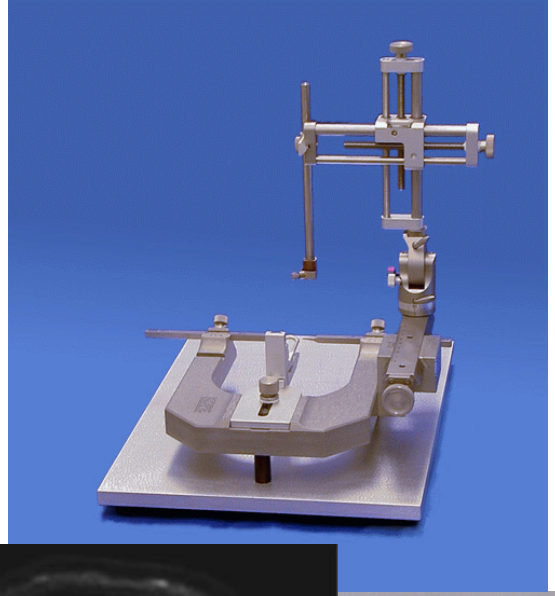
Weak synapse

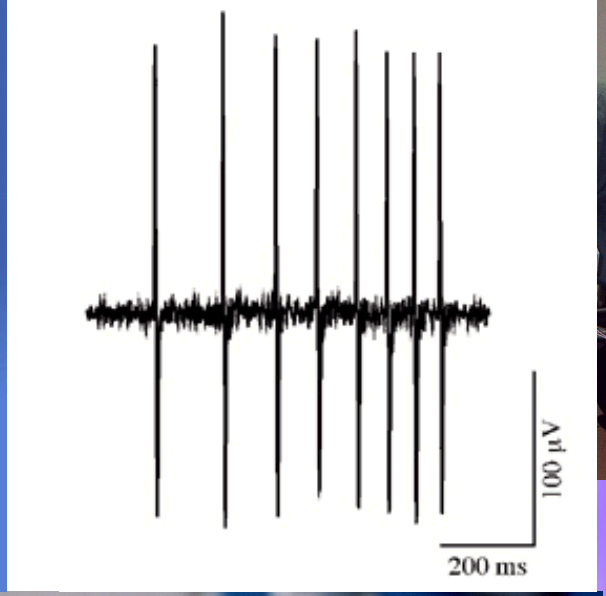
Strong synapse

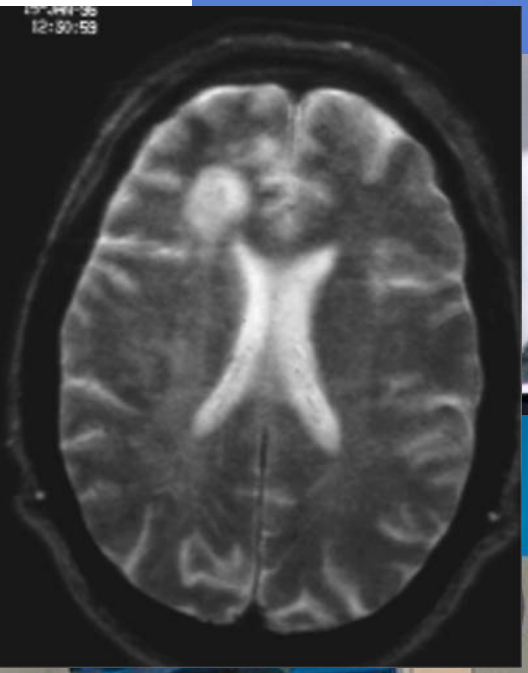


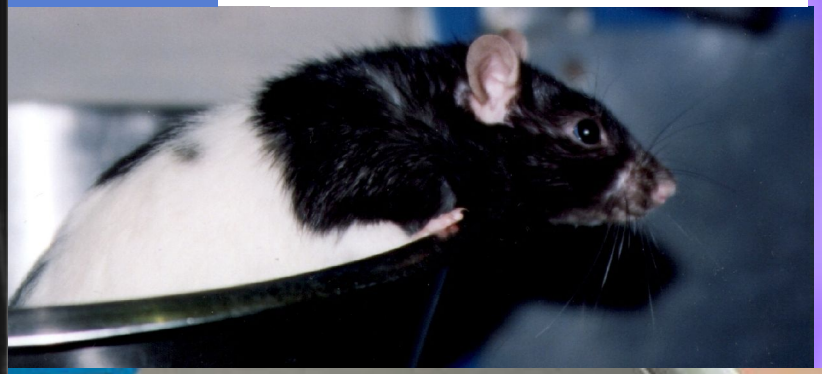
"When an axon of cell A is near enough to excite cell B, or repeatedly or consistently takes part in firing it, some growth process or metabolic change takes place in one or both cells such that A's efficiency, as one of the cells firing B, is increased."

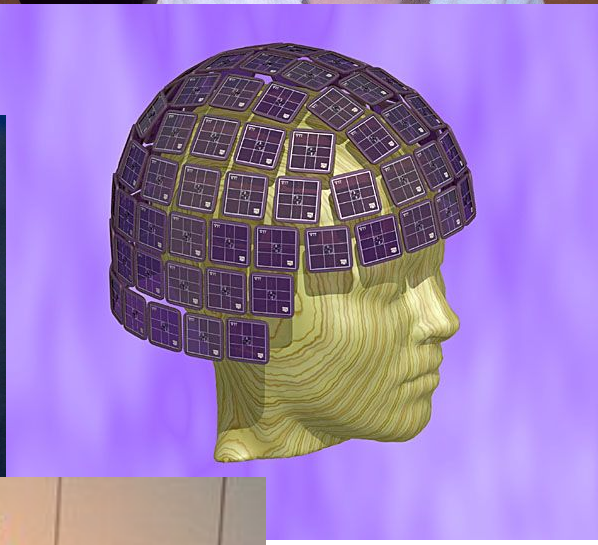
Hebb, 1949



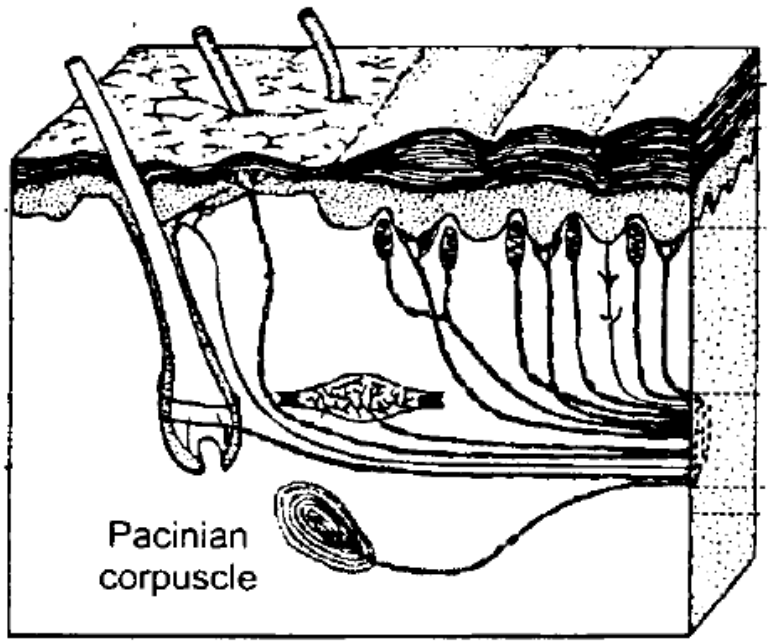

100 µV
200 ms

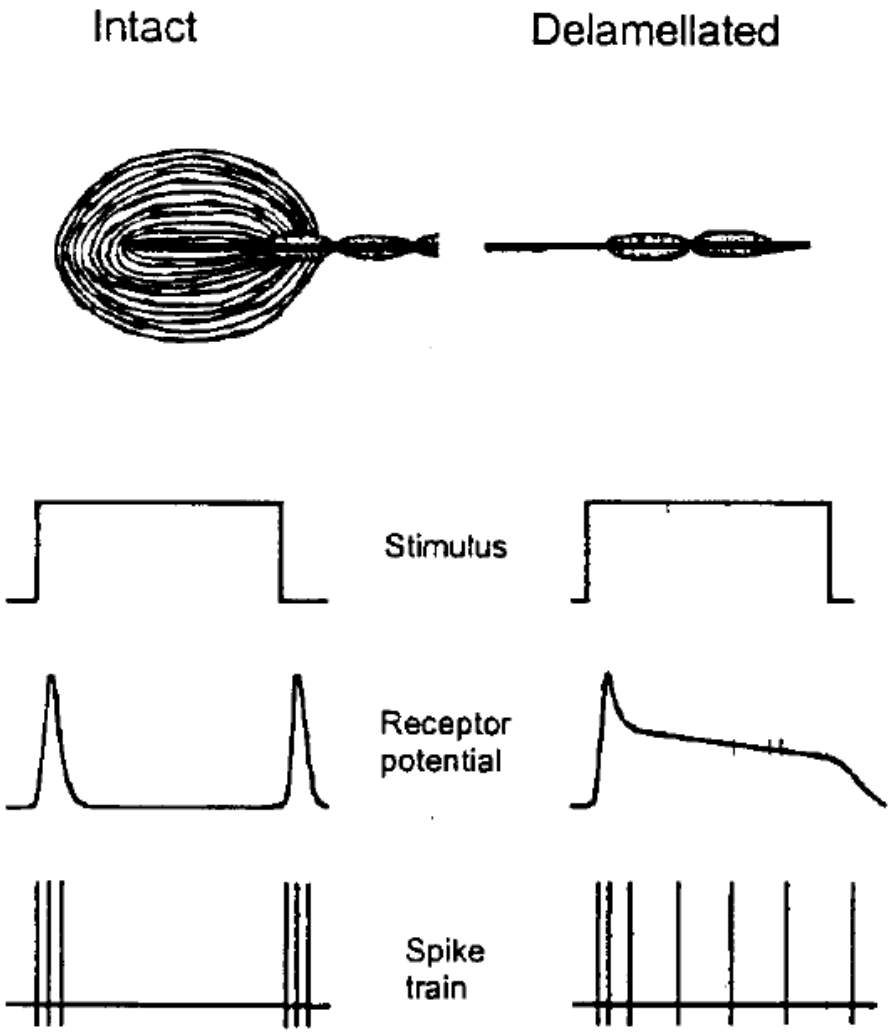


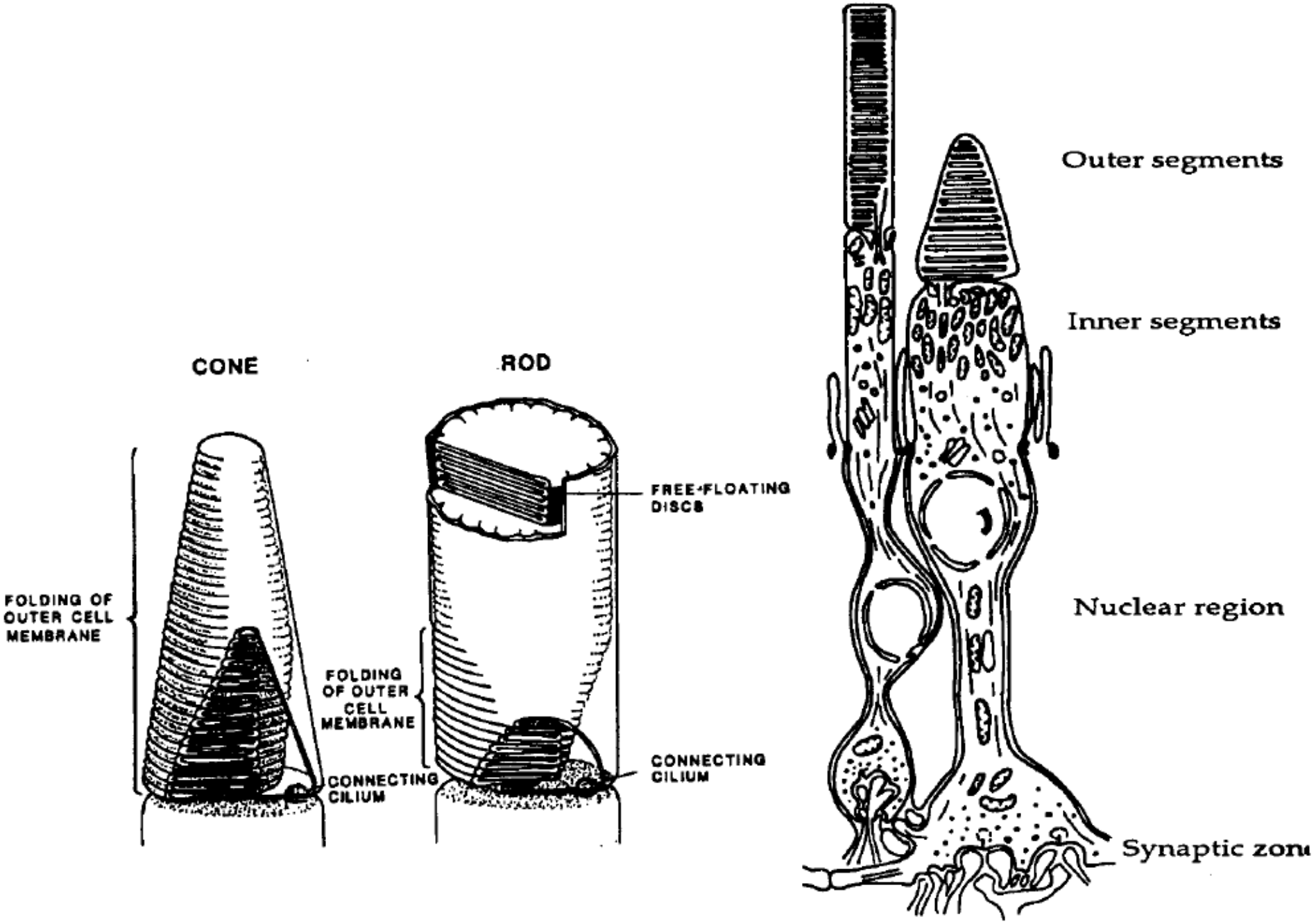


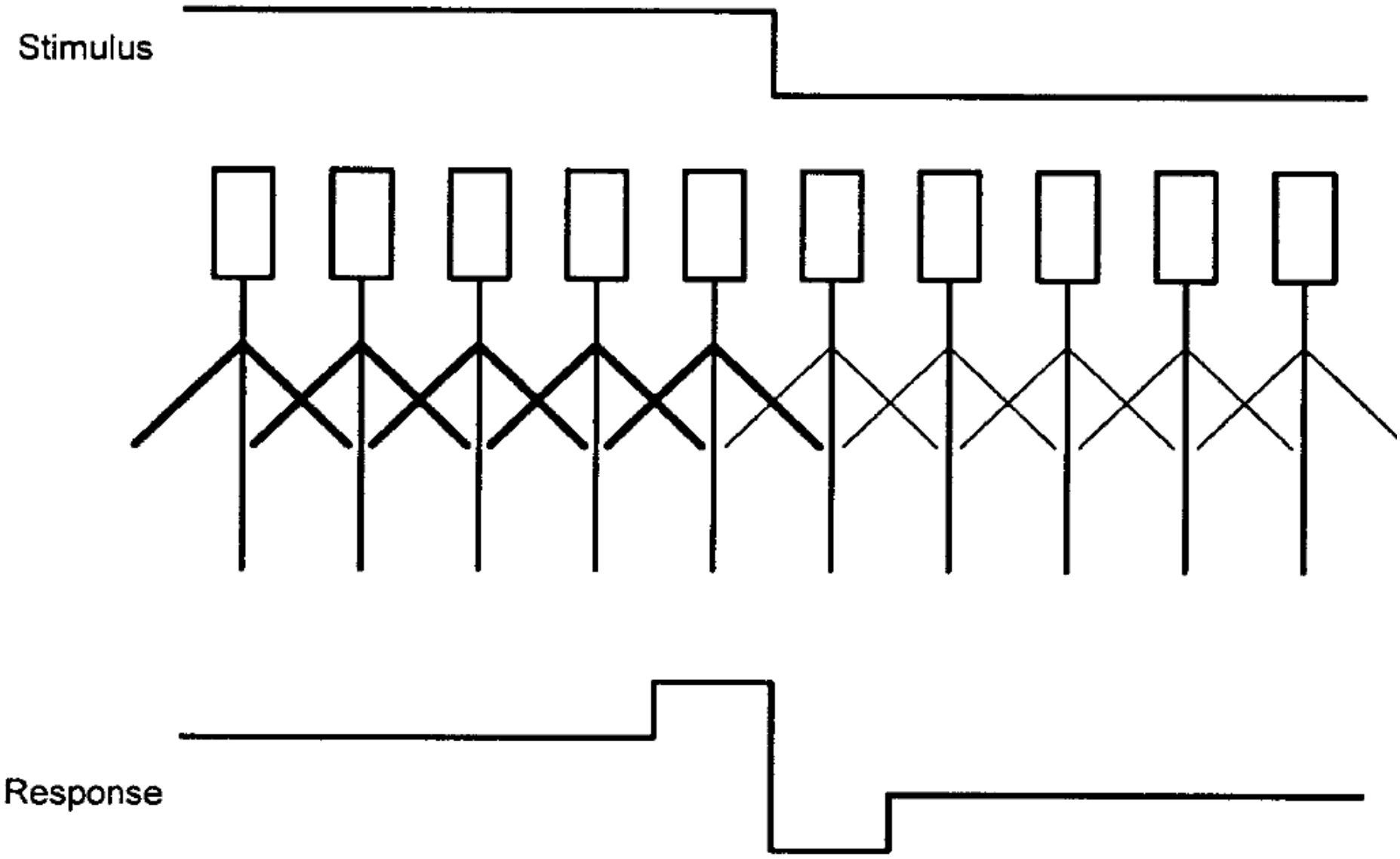


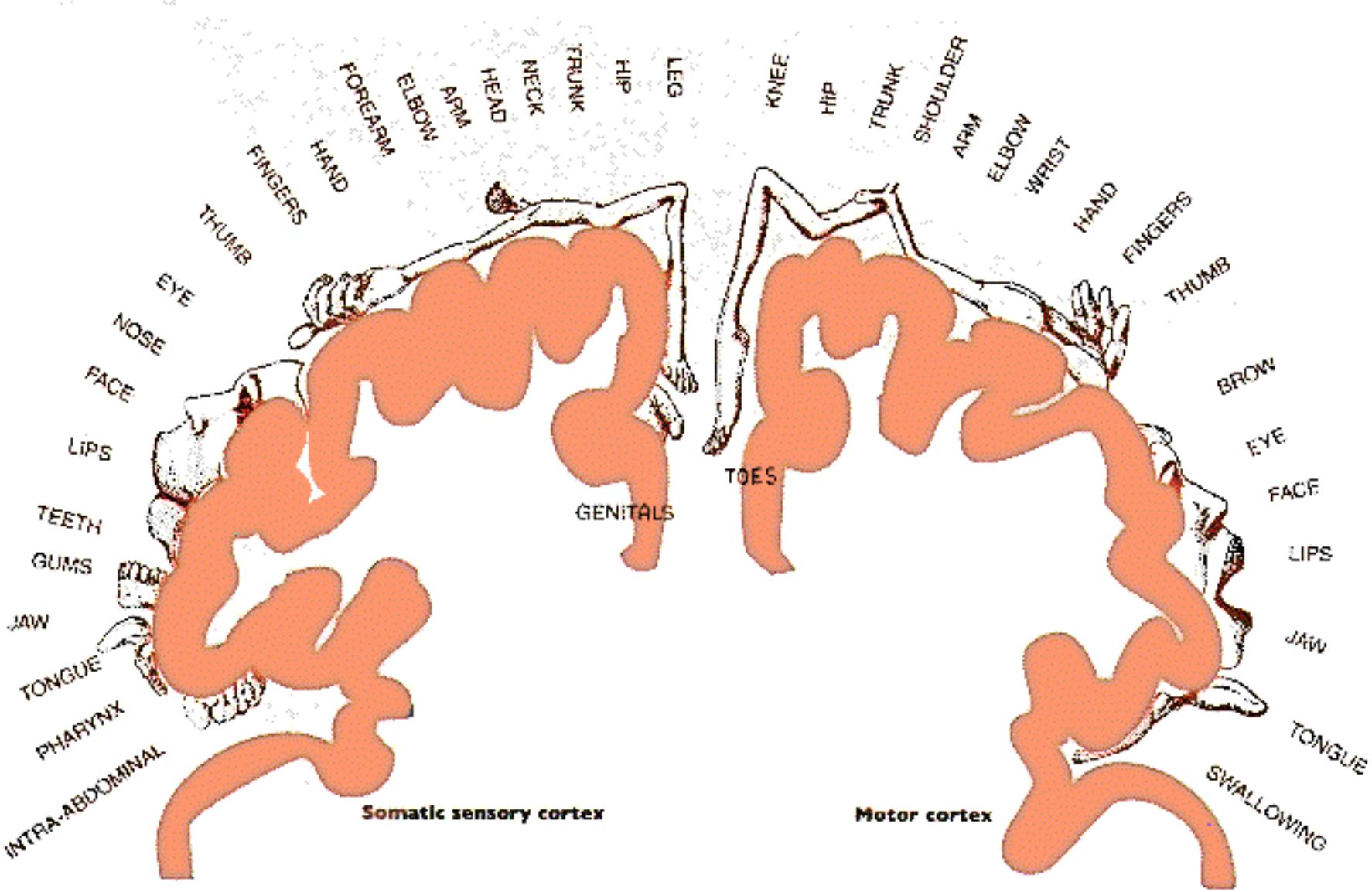
BOLD

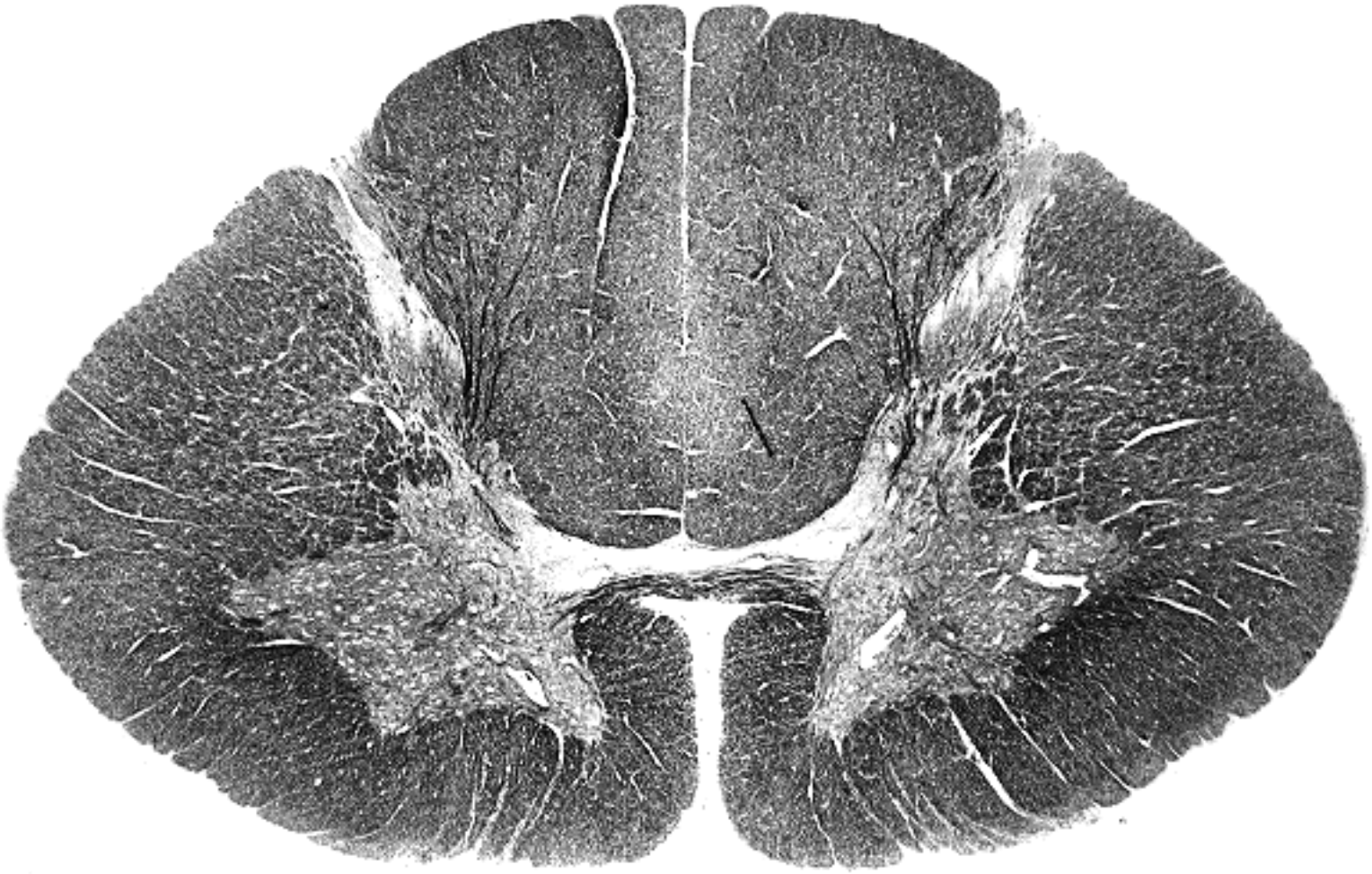

Pacinian
corpuscle

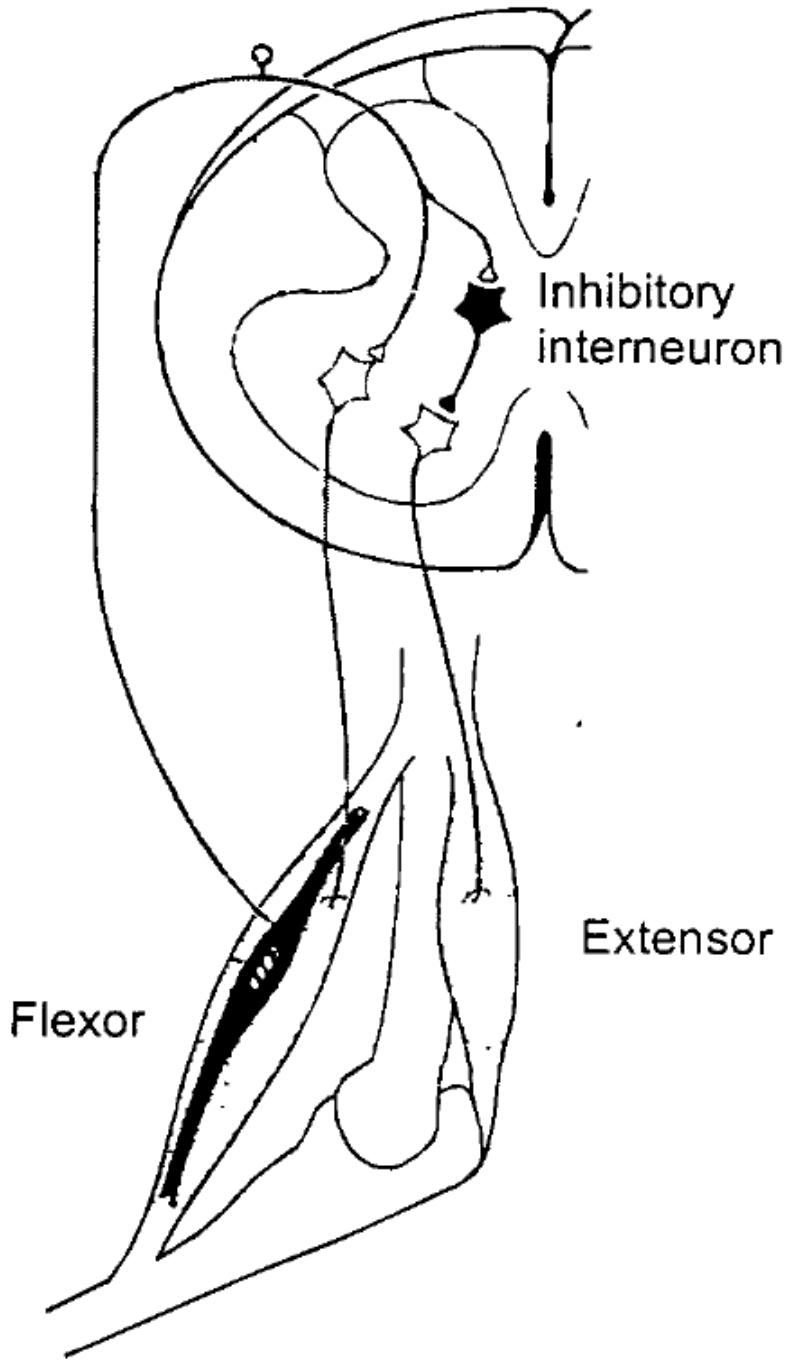

Intact
Delamellated
Stimulus
Receptor
potential
Spike
train

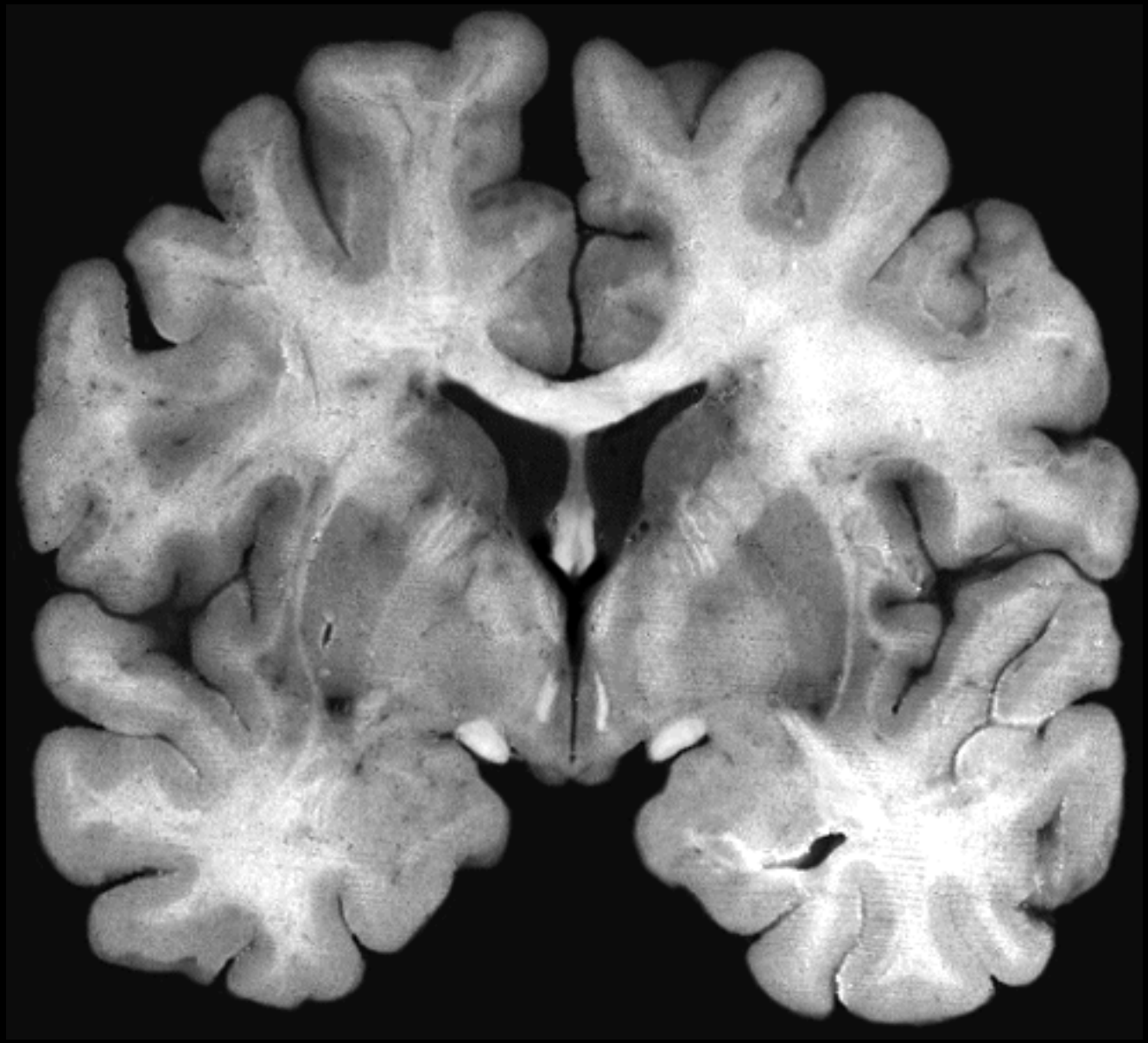

CONE
ROD
FOLDING OF OUTER CELL MEMBRANE
CONNECTING CILIUM
FREE-FLOATING DISCS
FOLDING OF OUTER CELL MEMBRANE
CONNECTING CILIUM
Outer segments
Inner segments
Nuclear region
Synaptic zone

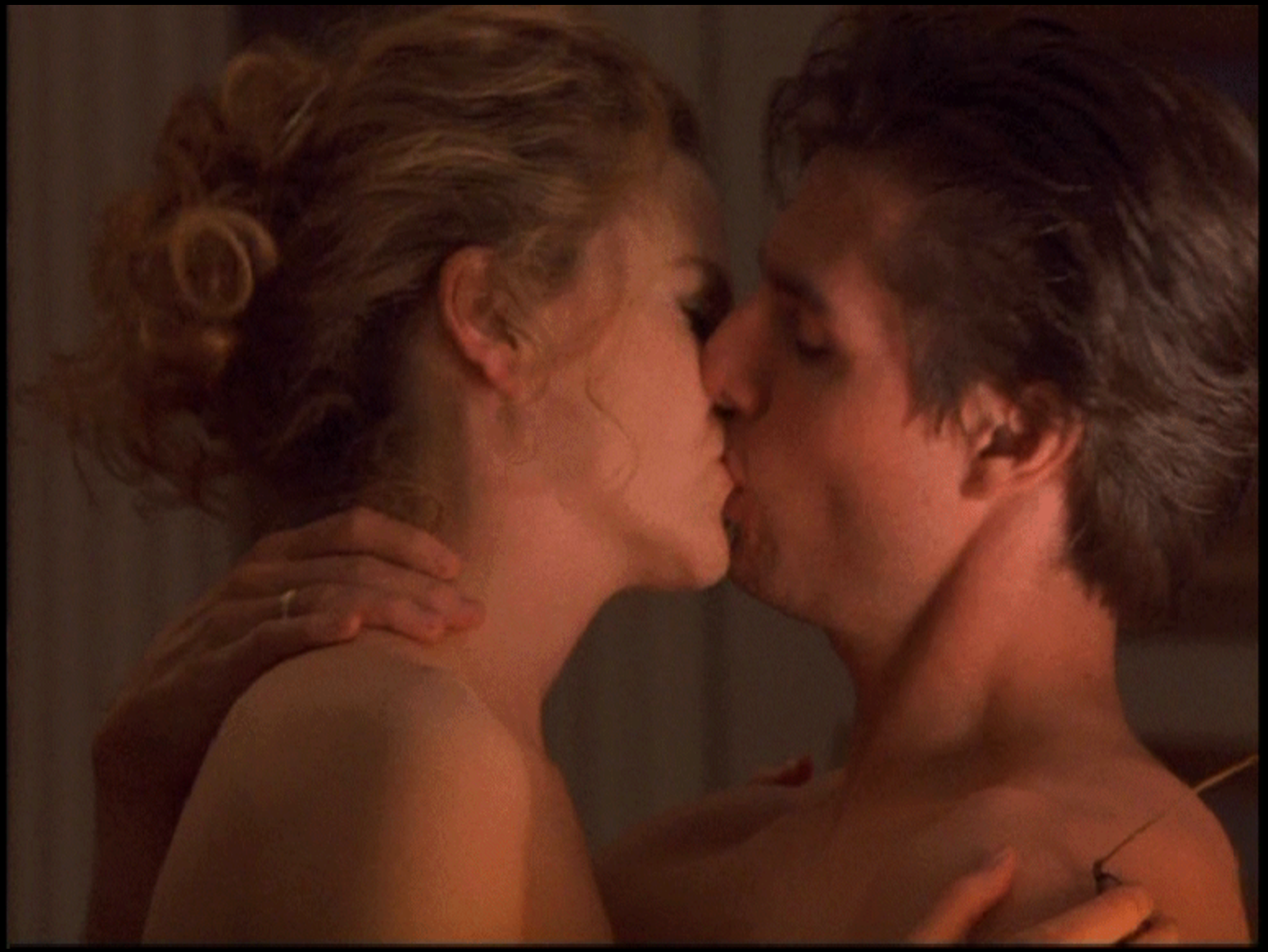

Stimulus
Response


LEG
HIP
TRUNK
NECK
HEAD
ARM
ELBOW
FOREARM
HAND
FINGERS
THUMB
EYE
NOSE
FACE
LIPS
TEETH
GUMS
JAW
TONGUE
PHARYNX
INTRA-ABDOMINAL
GENITALS
Somatic sensory cortex
TOES
KNEE
HIP
TRUNK
SHOULDER
ARM
ELBOW
WRIST
HAND
FINGERS
THUMB
BROW
EYE
FACE
LIPS
JAW
TONGUE
SWALLOWING
Motor cortex




Inhibitory
interneuron
Extensor
Flexor






WARNING