

Action Potential

Action potential is an event in which the membrane potential of the cell quickly rises and falls. The trajectory follows a constant pattern.

Components

Resting potential

Resting potential is largely determined by the difference concentration of K^+ ions and has a value of -70 to -90 mV, the cell's interior has a negative charge.

Action potential

If we introduce one electrode inside the axon and one to the cytoplasmic surface of the axon, hyperpolarization (in the case of negative internal electrodes) or depolarization (in the case of negative external) occurs.

If we increase the membrane potential to the *threshold potential* (in membrane with *resting membrane potential*, from -70 mV to about -55 mV), nerve fiber responds with the emergence of an action potential (sudden opening voltage-gated sodium ion channels, thus allowing ions of sodium to enter through the membrane, causing the inside of the cells to become positive - there is *transpolarization*).

If the increment in the membrane potential doesn't reach "threshold potential", the sodium voltage-gated channel will not open. In this case, no action potential is generated.

In the next phase, the membrane again becomes permeable for potassium ions and the potential returns to resting value despite a slight hyperpolarization.

Differences with postsynaptic potential

Differences between action potential (AP) and postsynaptic potential (PSP)

Parameter	AP	PSP
Characteristic	All or nothing	graded
amplitude	cca 100 mV	1-10 mV
duration	cca 10-40 ms	1-5 ms
Where?	along the axon	postsynaptic membrane (neuronal cell body, dendrites)
spread	without decrement	with decrement

Links

Related articles

- Membrane Potential
- Sodium-Potassium Pump

External links

Sources

References

Bibliography

Further reading



