

DIVERSITY OF K⁺ CHANNELS

ELECTROPHYSIOLOGICAL STUDIES

Last week we studied the characteristics and function of two voltage sensitive channels, the Na⁺ channels and delayed outward K⁺ rectifier channels, both involved in the generation of action potentials.

OBJECTIVES

Channels

1. A current – another type of voltage sensitive K⁺ channel.
2. K⁺ inward rectifier.
3. ATP-sensitive K⁺ channels –Ligand sensitive K⁺ channels
4. Ca⁺⁺ sensitive K⁺ channels –Voltage and ligand sensitive K⁺ channels

Aspects

5. Learn about the diversity in the electrophysiological and pharmacological properties of ionic channels within a tissue and between tissues.
6. Learn about the diversity of functions carried out by ionic channels.

REFERENCES

A-current

1. O. Belluzzi, O. Sacchi, and E. Wanke. A fast transient outward current in the rat sympathetic neurone studied under voltage-clamp conditions. *J.Physiol.(Lond.)* 358:91-108, 1985.

Inward rectifiers

2. C. A. Leech and P. R Stanfield. Inward rectification in frog skeletal muscle fibres and its dependence on membrane potential and external potassium. *J.Physiol.(Lond.)* 319:295-309, 1981.
3. H. Matsuda. Effects of external and internal K⁺ ions on magnesium block of inwardly rectifying K⁺ channels in guinea-pig heart cells. *J.Physiol.(Lond.)* 435:83-99, 1991

K_{ATP} channels

4. A. Noma. ATP-regulated K⁺ channels in cardiac muscle. *Nature* 305:147-148, 1983.
5. R. N. A. Gasser and R. D. Vaughan-Jones. Mechanism of potassium efflux and action potential shortening during ischaemia in isolated mammalian cardiac muscle. *J.Physiol.(Lond.)* 431:713-741, 1990