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Autore	Molleman Areles
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Nota di contenuto	Patch Clamping; Contents; Preface; 1 Introduction; 1.1 Patch Clamping and its Context; 2 Basic Theoretical Principles; 2.1 Introduction to Membrane Biology; 2.1.1 The plasma membrane and its ionic environment; 2.1.2 Electrochemical gradients and the Nernst equation; 2.1.3 Maintenance of ion gradients and the membrane potential; 2.1.4 Ion channels; 2.2 Electrical Properties of the Cell Membrane; 2.2.1 Driving force and membrane resistance; 2.2.2 Membrane capacitance; 2.2.3 Consequences of membrane capacitance; 2.2.4 An electronic model of the plasma membrane 2.3 Recording Modes and their Equivalent Circuits2.3.1 The basics of equivalent circuits; 2.3.2 Intracellular recording; 2.3.3 Voltage clamp and current clamp; 2.3.4 Introduction to patch clamp configurations; 2.3.5 The equivalent circuit for the cell-attached patch configuration; 2.3.6 The equivalent circuit for the whole-cell configuration; 2.3.7 The equivalent circuit for the excised patch configurations; 3 Requirements; 3.1 The Platform; 3.1.1 Stability: vibrations and drift; 3.1.2 Where in the building should the set-up be placed?; 3.1.3 Anti-vibration tables; 3.2

Mechanics and Optics

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4.1.2 Bringing the pipette near the preparation4.1.3 Making the seal; 4.2 Whole-cell Modes; 4.2.1 Conventional whole-cell recording; 4.2.2 Perforated patch recording; 4.3 Single-channel Modes; 4.3.1 General notes; 4.3.2 Cell-attached patch; 4.3.3 Excised patches; 5 Whole-cell Protocols and Data Analysis; 5.1 Standard Cellular Parameters; 5.2 Voltage-activated Currents; 5.2.1 Introduction to pulse protocols; 5.2.2 Signal conditioning and positive/negative subtraction; 5.2.3 Space clamp artefacts; 5.2.4 Isolation of a homogeneous population of channels

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6.2.3 Receptor-induced activity

Sommario/riassunto

Patch clamping is a widely applied electrophysiological technique for the study of ion channels; membrane proteins that regulate the flow of ions across cellular membranes and therefore influence the physiology of all cells. Patch Clamping aims to cover the basic principles and practical applications of this important technique. Starting with a review of the history of patch clamping, the text then goes on to cover the basic principles, platforms, equipment and environmental control, and will also include coverage of preparation types, recording modes and analysis of results. <