Introduction

Description

Bacteria convey unique biological structures that partly relate to a well-developped cell-wall structure structure. Thanks to the relative simplicty of bacteria (as opposed to larger organisms) many investigations of the cell-wall structure have been performed and shown to be the source of the understanding of many biochemical processes that have been subsequently shown to be relevant to other organisms. Most bacteria have cell walls that consist of one or more protective layers stacked on top of their cytoplasmic membranes. Differences exist in the constitution of cell wall structure depending on the type of bacteria (gran-negative, gram-positive, mycobacteria) ; there exists an innermost layer of a bacterial cell wall that consist of peptidoglycan (also referred to as murein) which form a meshwork of a polysaccharide strands crosslinked by oligopeptides. Many obscure points remain about peptidoglycans as an atomic description of the cell wall has not yet been established. This is the result of the size, heterogenicity and subsequent disordered structure in the sense of structural biology. The present chapter describes the main constituents of the bacterial cell wall ; the molecular and macromolecular structures of the peptidoglycan constituents and their arrangement at several orders of architectural organisation.