

Section - B

Ques 2] Discuss in detail chemistry of beta lactam antibiotics?

Ans The first β -lactam antibiotic discovered, penicillin was isolated from a mass variant of penicillium notatum (since renamed penicillium chrysogenum) β -lactam antibiotics that contain a beta-lactam ring & their molecular structures.

Most β -lactam antibiotics work by inhibiting cell wall biosynthesis in the bacterial organism and are the most widely used group of antibiotics. Bacteria often develop resistance to β -lactam antibiotics by synthesizing a β -lactamase, an enzyme that attacks the β -lactam ring. To overcome this resistance β -lactam antibiotics can be given with β -lactamase inhibitors such as clavulanic acid. β -lactam antibiotics are bactericidal, and act by inhibiting the synthesis of the peptidoglycan layer of bacterial cell wall. The peptidoglycan layer is important for cell wall structural integrity, (6) especially in Gram-positive organisms, being the outermost and primary component of the wall. The final transpeptidation step in the synthesis of the peptidoglycan is facilitated by DD-transpeptidases, also known as penicillin binding proteins. β -lactams are classified according to their core ring structures - (20). β -lactams fused to saturated five membered rings: β -lactams containing thiazolidine rings named penams. β -lactams containing pyrrolidine rings are named carbapenams.

