VANCOMYCIN RESISTANCE Inner membrane Und-MurNAc-(GlcNAc)-L-Ala-D-Glu-LL-dap-D-Ala-D-Lac Cell wall O Glycin K18354 UDP-MurNAc-L-Ala-D-Glu-LL-dap Und-PP-MurNAc-(GluNAc)-L-Ala-D-Glu-LL-dap-(Gly)-D-Ala-D-Lac Peptidoglycan biosynthesis Transglycosylation D-Ala-D-Ala Modified peptidoglycan ♥ with the D-Ala-D-Lac O terminus (S. coelicolor) OUDP-GlcNAc (VanA,B type) Elimination of pentapeptide UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala ddlA murG ddpX (S. coelicolor) P9301_08211 PBPsUDP-MurNAc-L-Ala-D-Glu-LL-dap-D-Ala-D-Lac Transpeptidation Peptidoglycan biosynthesis L-Ala D-Ala 04 UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala-D-Ala D-Lac UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala-D-Lac Pyruvate D-Lac Peptidoglycan (D- Ala, Gly crosslink) (VanA, B, D type) တ K15739 D-Ala-D-Lac K18345... K18344.. OUDP-GlcNAc V ancomycin UDP-MurNAc-L-Ala-D-Glu-L-Lys UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala-D-Ala D-Ala-D-Ala Peptidoglycan (D-Ala, L-Lys crosslink) Peptidoglycan biosynthesis **₽**03 K18866 ddlA D-Lac / D-Ser Elimination of pentapeptide UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala D-Ala L-Ala PBPsTeicoplanin (in VanA type) UDP-MurNAc-L-Ala-D-Glu-L-Lys K18856 Transpeptidation UDP-MurNAc-L-Ala-D-Glu-L-Lys-D-Ala-D-Ser (VanC, E, G type) **FO** murF D-Ala-D-Ser D-Ser Modified peptidoglycan with the D-Ala-D-Lac / D-Ala-D-Ser terminus K18348 O UDP-GlcNAc OL-Ser Und-PP-MurNAc-(GlcNAc)-L-Ala-D-Glu-L-Lys-D-Ala-D-Ser Transglycosylation (Low-level resistance) Und-PP-MurNAc-(GlcNAc)-A-Ala-D-Glu-L-Lys-D-Ala-D-Lac (High level resistance) Vancomycin resistance operon types Resistance S. coelicolor. (chromosome) K18347 K18354 K18344... K18353 Regulation Resistance Regulation Resistance Accessory Accessory VanA cluster (Plasmid) VanD cluster (Chromosome) K18347 K18344.. VanZRegulation Regulation Resistance Resistance Accessory VanB cluster (Plasmid chromosome) VanE cluster (Chromosome) K18345... K15739 Resistance Resistance Regulation Regulation Accessory VanC cluster VanG cluster (Chromosome) (Chromosome) K18345... VanU VanG 01502 1/19/15 (c) Kanehisa Laboratories