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MOLECULAR DYNAMICS AND ANALYSIS OF INTERACTIONS BETWEEN TWO MURAMYL PENTAPEPTIDE DERIVATIVES AND THE VANCOMYCIN OR VANCOMYCIN DERIVATIVES

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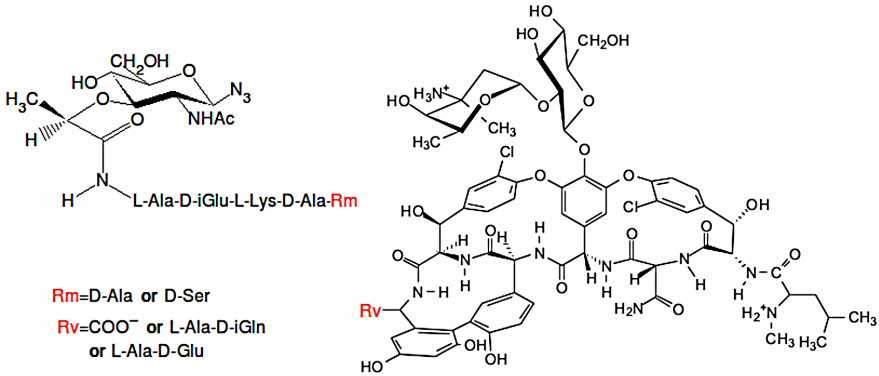
Using standard Amber 11 tools and procedures [1] we have prepared and modeled a working models of two modified muramyl derivatives (cf. Figure, left) interacting with vancomycin and two vancomycin derivatives (cf. Figure, right). Such interactions are part of mechanism of action of vancomycin – a glycopeptide antibiotic, a drug of last resort in Gram-positive bacterial infections treatment [2]. Vancomycin inhibits the last steps of the cell wall biosynthesis in Gram positive bacteria [3]. It binds to the C-terminal D-Ala-D-Ala fragment of peptidoglycan precursors, such as modeled muramyl derivatives, preventing their incorporation into the cell wall [4]. In modified muramyl pentapeptide there is present a D-Ala-D-Ser C-termini which prevents vancomycin from binding to peptidoglycan and results in resistance of the bacteria to this antibiotic. We study whether modified vancomycin moiety is capable of overcoming this effect.



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