Papassara Sangtanoo 2012: Structure and Function Relationships of Bacteriocin of *Lactobacillus salivarius*. Master of Science (Genetics), Major Field: Genetics, Department of Genetics. Thesis Advisor: Mrs. Anchanee Kubera, Ph.D. 90 pages.

Bacteriocins are antimicrobial peptides that can inhibit bacteria which are the cause of food spoilage. The aims of the present study are to understand the mechanism of these peptides and to improve the bacteriocin production. Two isoforms of bacteriocin, salvicin K (sal K) and antimicrobial-like bacteriocin β (alb β) from *Lactobacillus salivarius* K4 were cloned into *Escherichia coli* using intein as a fusion tag. The recombinant proteins were expressed under IPTG induction as inclusion bodies. These inclusion bodies were solubilized in 50 mM Tris-HCl pH 8.8. The solubilized proteins were tested by spot-on-lawn technique to check antimicrobial activity against sensitive indicator strains. The recombinant active alb β fused with intein could inhibit *Lactobacillus plantarum* ATCC 14917^{T}. The active sal K and alb β peptides were synthesized and checked their minimal inhibitory concentrations (MICs). The results showed antimicrobial activities of these peptides against several gram-positive bacteria, *Enterococcus feacalis* JCM 5803^{T}, *Lactobacillus plantarum* ATCC 14917^{T} and *Streptococcus* sp. TISTR 1030. These two peptides also performed hemolysis against rat red blood cells. The LC_{50} of sal K and alb β were found at 371.83 μg/ml and 366.23 μg/ml, respectively. The hemolysis activity of active sal K and active alb ββ were 87.36% and 85.38%, respectively. No synergism of sal K and alb β was observed. Both sal K and alb β showed unordered structure when they were in buffer pH 3-9 but they exhibited alpha helix and beta sheet structure when they were in membrane-mimicking environment. These results implied that alpha helix and beta sheet conformation may play an important role for their antimicrobial activity.

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