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### Analyses of Phenotypes about Deleted Mutants of *cpxR/lon* Genes Constructed as Live Attenuated *Salmonella* Vaccines

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The CpxR, a component of two component regulator system CpxAR, and Lon, an ATP-dependent protease, play roles as critical global regulators. To construct live attenuated *Salmonella* vaccines by deletions of these genes, we deleted independently *cpxR* and *lon* genes, resulting in CK31 and CK38, respectively, or deleted both genes in a strain, resulting in CK111. The mutated strains maintain normal growth rates when compared with wild type (wt) *S. typhimurium*  $\chi$ 3339. The results of measurements of biochemical and physiological activities via API 20E kit were observed to the same activities with wt *S. typhimurium*  $\chi$ 3339, except for melibiose fermentation. When compared with wt *S. typhimurium*  $\chi$ 3339 by TEM (transmission electronic microscope), CK31 increased Agf expression, whereas this phenomena was not dictated by CK38. However, CK38 was observed by morphology of longer cells, as well as increase of capsular polysaccharides. Although CK111 showed the overlapped phenotypes with described two mutants, capsular polysaccharides exhibited a little increase. The LD<sub>50</sub> of BALB/c mouse against CK31 observed lower than that of wt *S. typhimurium*  $\chi$ 3339 (below 3.8 folds), whereas CK38 and CK111 was higher (up to 4 log) and (up to 3 log), respectively. All taken together, these results suggest that CK38 and CK111 could use potential live attenuated *Salmonella* vaccines.

**Key words:** Live attenuated *Salmonella* vaccine, *cpxR* gene, *lon*, gene, Agf, capsular polysaccharides

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### Small GTPase Rho A Regulate Uropod Formation through F-Actin Reorganization in EL4 T Lymphocytes

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Mobile T lymphocyte features are two distinct morphological shapes. Front-rear asymmetry in motile cells is crucial for efficient directional movement. The uropod in migrating lymphocyte is a posterior protrusion in which several proteins, including CD44, ERM (ezrin/radixin/moesin), and F-actin cytoskeleton are concentrated. F-actin cytoskeleton is a basic mold for the shape maintenance. Rho A small GTPase acts as cytoskeleton organizer. So far, various pathways potentially can induce the Rho activation. PDZ domain is able to increase active Rho A form (Rho-GTP) level, reorganize F-actin cytoskeleton, and thus disrupts the uropod structure, suggesting that signaling pathway of Rho and F-actin cytoskeleton are related to uropod formation.

**Keyword:** Uropod, PDZ, small GTPase, F-actin, T cell migration