

# Exploring the Mechanism of Bacterium in Tumor Therapy: Comparison of Immuno-activity of Lipopolysaccharide from *Salmonella enterica* and *Salmonella typhimurium*

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In order to explore how the immune response caused by *Salmonella Typhimurium* plays a role in tumor bacteriotherapy, lipopolysaccharide (LPS) was extracted from *Salmonella Typhimurium* and another serovar of *Salmonella enterica* that were cultivated both aerobically and anaerobically. To begin with, it is shown that the activity of LPS from anaerobically-cultivated *Salmonella* is generally higher than that from aerobically-cultivated one, with activity of the LPS from anaerobically-cultivated *S. Typhimurium* being 3 to 4 times higher than the other *Salmonella* LPS, which suggests that the tumor anaerobic microenvironment may have a significant effect on the activity of *Salmonella* LPS. Furthermore, it is discovered that *Salmonella* LPS could generally promote TLR 3,4,7 gene expression in normal cells, TLR9 gene expression in cancer cells, and suppress TLR3,4 gene expression in cancer cells, among which the influence of LPS from anaerobically-cultivated *S. Typhimurium* is more significant. Combining these results with past researches, it is proposed that these influences can help stimulate immune responses to attack tumor while also suppress the tumor development, and the higher activity and the strong inducing effects on TLR genes of LPS from anaerobically cultivated *S. Typhimurium* is also consistent with its proven effect of curing tumor. In conclusion, the results are consistent with past researches that *S. Typhimurium* is one of the most possible microorganisms that can be used for large scale clinical treatment of tumor, which suggests that LPS may play an important role in tumor bacteriotherapy by influencing the gene expression of TLR family, which is worth intensive study.

**Awards Won:**

