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Comparative selectivity of various Salmonella typhimurium strains in targeting prostate cancer cells

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Recent studies indicate that non-virulent strains of serovar typhimurium () have tumor-targeting activity. Indeed, S. typhimurium has been observed to selectively target cancer tissue by a ratio of over 1000:1. However, most of these studies focused on the cancer cell selectivity of one strain, the genetically modified VNP20009. One such study found that a single IV injection of VNP20009 produced tumor growth inhibition of 57-95% in mice. Another study conducted by Thamm and associates found that administration of VNP20009 results in detectable bacterial colonization of tumor tissue and partial anti-tumor activity in tumor-bearing dogs. However, VNP20009 was shown to be too toxic when given to cancer patients in phase I clinical tests. Scientists at Columbia's Cancer Research Center discovered an archival strain of (CRC1674) that destroys PC-3M prostate cancer cells without extensive lysis of the cancer cells, a factor thought to contribute to the toxicity of VNP20009. This project studies the comparative selectivity of four strains for prostate cancer cells. In order to study attachment to prostate cancer cells, shorter incubation times were used, up to a period of 4 hours. Invasion assays involved incubation periods up to 24 hours. To confirm distinct selectivity towards prostate cancer cells only, the study also included attachment and invasion assays using noncancerous prostate cells. We have discovered attachment after 5 minutes of co-incubation and are currently investigating long-term effects of co-incubation with prostate cancer and normal cell lines.