Inhibition of Bone Metastasis in MDA-MB-231 and PC-3 Cells by the Extracellular Adherence Protein of Staphylococcus aureus

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The purpose of this project was to look at the effect of S.aureus protein A, the extracellular adherence protein of Staphylococcus aureus, on the bone metastatic processes of breast and prostate cancer cells. Specifically adhesion, migration and invasion of cells to osteopontin, a protein cells must adhere to in order to start bone metastasis, was looked at in order to quantify the effect of the protein. Three assays were conducted: migration, invasion and adhesion. The migration assay was used to look at the effect of the protein on the tendency of the cells to migrate to OPN. The invasion assay was used to look at the effect of the protein on the cells' ability to get through the extracellular matrix of the bone and then migrate to OPN. Finally, the adhesion assay was used to look at the ability of the cells to adhere to osteopontin after exposure to S. aureus Protein A. It was found that S. aureus Protein A inhibited bone metastatic processes in a dose-dependent manner in both MDA-MB-231 and PC-3 cell lines. While the cells reacted better to MDA-MB-231 overall, there was only consistently a significant difference in the results at 10 µg/ml across all assays. In all assays, the reaction of the cells at the 20 µg/ml concentration was not statistically different from that of the positive control, cRGD, which is a known antimetastatic agent. This means the protein is as effective as the positive control at this concentration.