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Role of Bone Morphogenetic Protein in Lung Cancer

[Determine whether BMP-2 stimulates in vivo the invasion and metastasis of lung cancer.]

Lung cancer is the number one cause of cancer deaths in the United States with over 150,000 people this year expected to die from their disease. Ninety percent of patients with lung cancer will die of their disease predominantly because of distant spread of their tumor. There is a pressing need to improve our understanding of how lung cancer and other malignancies spread. We identified using a subtraction technique that the bone morphogenetic protein 2 (BMP-2) is highly expressed in lung tumors in comparison to normal lung tissue. BMP-2 is known morphogenetic protein capable of inducing the entire cascade of new bone formation from normal tissue. We show BMP-2 that stimulates lung cancer cells to migrate and invade suggesting it may regulate the spread of tumors. These data suggest that uncontrolled expression of BMP-2 may have biologic significance in cancer. This proposal will determine whether specific inhibition of BMP-2 prevents the spread of lung cancer cells in mice and examines the mechanism by which this occurs. This proposal is of particular importance since other investigators have developed inhibitors of BMP-2, which could potentially be used as therapeutic modalities. This proposal will provide critical information for the development of therapies to prevent the spread lung and other human malignancies. Since this protein is highly expressed and is secreted it can potentially be used as a marker for early cancer detection.