TGF-Beta Binding Peptides and Tumors

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SUMMARY

UCLA researchers have developed a method to use TGF-beta binding peptides such as BBP to bind TGF-beta and remove it from solution for treatment of metastatic diseases.

BACKGROUND

Metastatic cancer is a cancer that can spread from the part of the body where it started to other parts of the body, which makes them harder to treat. Therefore, there is a need for more effective and less toxic therapeutics to manage metastatic diseases. The transforming growth factor beta (TGF-beta) signaling pathway is a key player in metastatic diseases and its misregulation can result in tumor development. The TGF-beta superfamily is comprised of over 40 members, including TGF-betas and bone morphogenetic proteins (BMPs).

Previous studies have shown that neutralizing TGF-beta with antibodies improves outcomes in animal models of metastatic diseases. Bone morphogenetic proteins (BMPs) are a group of growth factors that are able to induce the formation of bone and cartilage. The inventors had previously discovered that BMP binding peptides (BBPs) bind to BMP-2 and inhibit BMP-2 activity *in vitro*. The parental protein of BBP, spp24, binds BMP-2 *in vivo* and inhibits its activity, and it is known that BBP binds to TGF-beta as well.

INNOVATION

UCLA researchers have developed a method to use TGF-beta binding peptides such as BBP to bind TGF-beta and remove it from solution for treatment of metastatic diseases. TGF-beta binding peptides would be delivered to the site of metastases to neutralize TGF-beta and BMPs.

APPLICATIONS

- ▶ The primary application for this invention is to reduce growth of tumors and metastases.
- ▶ This invention can also be used in other TGF-beta related diseases, such as fibrosis and inflammation.

ADVANTAGES

- ▶ Currently, only antibodies have been tested for TGF-beta binding and neutralization, and these antibodies are not yet in clinical use. Synthetic peptides would be easier and less costly to produce and possibly associated with fewer side effects.

STATE OF DEVELOPMENT

UCLA researchers have demonstrated the binding of TGF-beta to BBP.

RELATED MATERIALS

- ▶ K. Behnam, M. L. Phillips, J. D. P. Silva, E. J. Brochmann, M. E. L. Duarte, and S. S. Murray, BMP binding peptide: A BMP-2 enhancing factor deduced from the sequence of native bovine bone morphogenetic protein/non-collagenous protein, in Journal of Orthopaedic Research, 2005.

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OTHER INFORMATION

KEYWORDS

TGF-beta binding peptides, BMP, BBP, metastatic diseases, cancer, tumor

CATEGORIZED AS

- ▶ Medical
  - ▶ Disease: Cancer
  - ▶ Therapeutics

RELATED CASES

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