Antibody Fusion Proteins with Disrupted Heparin- Binding Activity

Tech ID: 21182 / UC Case 2010-594-0

SUMMARY

Heparin sulfate is found throughout all tissues and commonly bound to the cell surface. Many signaling molecules such as growth factors, chemokines and cytokines bind to heparin present at the cell surface and in the extracellular matrix of all tissues. While this local heparin binding is an advantage when the cytokine is secreted in its normal environment to be locally retained, it may be a drawback when the cytokine is being delivered by a targeting device such as an antibody fusion protein. In a therapeutic antibody-cytokine fusion protein, the antibody provides the specificity to a tumor antigen and the fused cytokine provides an enhanced immune response to the tumor, thus concentrating the cytokine in the tumor microenvironment.

However, the cytokine domain of the antibody fusion protein retains its ability to bind heparin, with the potential to bind non-specifically to a broad variety of cells and the extracellular matrix, thereby reducing its specificity, increasing the effective dose, and creating the potential for unfavorable side effects. To overcome this limitation, UCLA researchers have developed mutants of IL-12 that are able to stimulate the immune system while disrupting its heparin-binding domain.

INNOVATION

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APPLICATIONS

Although the initials studies are focused on one antibody-cytokine fusion protein containing IL-12 and targeting HER2/neu, there are a number of other therapeutic approaches involving targeted delivery of a broad spectrum of heparin-binding cytokines and chemokines that might also benefit from a reduction in non-specific tissue/heparin binding. It is possible that there could be major improvements in targeted anti-cancer immunotherapy in general that result from the proposed studies.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,617,557	12/31/2013	2010-594

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2010-594-0

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