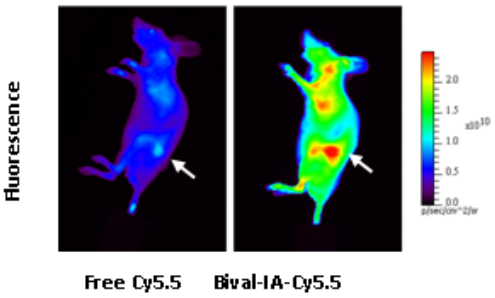
HOUSTON METHODIST INVENTION:

Highly Potent Fluorescent Multivalent Integrin Antagonists for targeted therapy and imaging

Invention

This invention presents a new class of fluorescent integrin $\alpha v\beta 3$ antagonists that display higher binding affinity, specificity, and inherent stability than commercially available integrin antagonists. Integrin $\alpha v\beta 3$ has been shown to be involved in the formation of angiogenesis, a phenomenon that occurs in a variety of physiological and pathological processes, thereby making it an attractive target for the development of suitable candidates for imaging, diagnosis and/or therapy for one or more symptoms of diseases including cancer, osteoporosis, rheumatoid arthritis, and macular degeneration.



***In vivo* fluorescence imaging of live U-87 xenograft tumor-bearing mice 24 hours post intravenously administered unconjugated Cy5.5 *vs.* bivalent IA-Cy5.5.**

Background

The finding that multivalent interactions produce higher biding affinity and specificity as compared to monovalent interactions has stimulated research into the design of new therapeutic and imaging agents. Current methods for developing multivalent ligands have proven to be inefficient; therefore, there is a need for the development of new methods that efficiently produce more potent multivalent ligands.

Advantages

- A new highly efficient and accurate method for the design, synthesis and testing of more potent multivalent drug candidates that are useful for imaging as well as for treating one or more symptoms of cancer, inflammatory diseases, and autoimmune diseases.
- The multivalent integrin $\alpha_v\beta_3$ ligands have over **100 fold the binding affinity** of parent ligands resulting in significantly increased tumor cell uptake *in vitro*.
- Multivalent integrin $\alpha_v\beta_3$ ligands have been shown to have higher specificity for the integrin $\alpha_v\beta_3$ receptor associated with tumors and an inherent stability not shown in commercially available ligands, resulting in increased tumor accumulation and retention *in vivo*.

For more information, contact the Office of Technology Transfer by e-mail at OTT@HoustonMethodist.org.

About Houston Methodist

Houston Methodist is comprised of a leading academic medical center in the Texas Medical Center® and four community hospitals serving the greater Houston area. Houston Methodist Hospital, the system's flagship, is consistently listed among U.S. News & World Report's best hospitals and we extend that same level of quality care across the system. Houston Methodist Research Institute is home to some of the world's brightest physician-scientists, working in a collaborative environment on more than 700 clinical trials. The Research Institute is making strides in the new 440,000-square-foot facility, bringing us even closer to medical breakthroughs in cardiovascular disease, cancer, infectious disease, neurosciences, diabetes and more.

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