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News

Abbott Scientists Create One Molecule With Two Antibody Functions

First Combination of Large Molecules to Show Drug-like Properties and Manufacturing Feasibility

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Abbott Park, Ill., Oct. 18, 2007 -- Abbott reported today that its scientists are the first to discover a proprietary technology that combines the function and specificity of two or more monoclonal antibodies (mAbs) into one molecular entity that demonstrates drug-like properties and manufacturing feasibility. These molecules, called [dual-variable domain Ig \(DVD-Ig™\)](#), will allow for development of individual drug candidates that target multiple disease-causing molecules in various therapeutic categories.

Published online earlier this week in [Nature Biotechnology](#), this landmark study demonstrates a completely new platform that may be relevant to cancer, autoimmune diseases and other complicated conditions in which multiple disease-mediators are at play. Simultaneous blockage of multiple targets using DVD-Ig agents may increase efficacy in comparison to inhibition of a single target using a mAb.

“Combining the specificity of two or more antibodies into one drug has been a significant challenge for researchers looking at next generation biologic therapies,” said Abbott Scientists Chengbin Wu, Ph.D. and Tariq Ghayur, Ph.D., who designed the DVD-Ig molecules and led the research team. “Abbott’s approach is remarkably versatile and efficient in creating a single molecular entity with drug-like properties and the ability to target multiple disease mediators. We are very excited about the doors this opens in drug development across a range of therapeutic areas.”

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The process of combining two or more mAbs involves the use of molecular biology techniques, such as polymerase chain reaction (PCR), to link the regions (variable domains) of two different antibodies that target specific disease-causing molecules. The resulting molecule has two different (dual) variable domains, each of which targets a different disease-causing antigen.

While other public and private research programs have endeavored to combine two antibodies into one entity, the results have been limited by poor pharmacokinetics, stability and manufacturing feasibility.

Addressing only one disease target with a traditional mAb can result in limited efficacy because the disease can progress on multiple levels. For example, in rheumatoid arthritis (RA) distinct disease mediators (mechanisms) contribute towards various aspects of the disease such as inflammation, angiogenesis, pannus formation (thickened layers of granulation tissue) and bone and cartilage erosion. Therefore, targeting two or more disease mechanisms in RA may show far greater efficacy than targeting a single mechanism.

Using the DVD-Ig technology, research teams at Abbott have already created a single drug candidate that targets multiple disease components, one of which is TNF- α , a well-established target in RA. Preclinical evaluation of this drug candidate is underway.

Abbott's DVD-Ig approach has distinct technological, scientific and drug development advantages compared to mAbs and to previous efforts to create a multi-specific antibody. The approach is compatible with any antibody, including humanized mAbs, fully-human mAbs and chimeric mAbs, and can potentially be extended beyond antibodies to receptor proteins and other, similar molecules. DVD-Ig drugs also may have improved efficacy because they target multiple disease-causing molecules, and can address redundant disease processes, in which two different molecules have the same disease-causing effect.

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Abbott has completed technology validation on the DVD-Ig program, and is currently confirming process development and manufacturing for the technology platform. Concurrently, preclinical work has been conducted on a variety of combinations at Abbott to date.

About Abbott

Abbott is a global, broad-based health care company devoted to the discovery, development, manufacture and marketing of pharmaceuticals and medical products, including nutritionals, devices and diagnostics. The company employs 65,000 people and markets its products in more than 130 countries.

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