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LONDON, UK (GlobalData), 14 May 2012 - Recently **Compugen**, Ltd., an Israel-based biopharmaceutical company with over 17 years of research experience, released animal model data from the company's proprietary Protein Family Members Discovery Platform. This in-house, in silico bioinformatics system provides a predictive view of protein characteristics leading to gene and protein discovery. Compugen has discovered nine proteins from the **B7/CD28 protein family**, which is known to play a role in regulating immune response. Of these nine proteins, two were recently used in animal models to show an initial efficacy signal in multiple sclerosis (MS) and rheumatoid arthritis (RA) models. These soluble fusion proteins were designed by fusing the extracellular domain from the **B7/CD28-like protein** to a fragment crystallizable (Fc) antibody fragment and are known as **CGEN-15031** (MS therapy) and **CGEN-15051** (RA therapy).

B7 proteins are found on the surface of antigen presenting cells that stimulate T cell proliferation and CD28 is the receptor for B7 molecules. When fused they become co-stimulatory and regulate an immune response. Targeting the B7/CD28 co-stimulatory pathway takes a two-pronged approach benefiting two therapeutic areas. The first approach would suppress the immune system, thus becoming a potential pathway target for treatment of autoimmune disorders (MS and RA). The second approach up-regulates the B7/CD28 pathway, allowing the immune system to recognize and terminate evading cancer tumour cells.

The multiple sclerosis CGEN-15031 study was performed in Professor Stephen Miller's Northwestern University laboratory with experimental autoimmune encephalomyelitis (EAE) mouse models specific for MS. Preclinical results showed that the protein alleviated symptoms and relapses in the relapsing-remitting MS model. It accomplished this through inhibition of pathological immune response and inhibition of epitope spreading. Epitope-spreading occurs when a specific epitope provokes an immune response, which in turn causes the immune system to search for a "new" antigen target. The new antigen, which is distinct from but not cross-reactive with the previous antigen, becomes the new target, leading to an auto-immune response. This phenomenon is seen in autoimmune diseases such as MS and is a type of chronic immune system activation. Similar results were seen in a study in which collagen-inducted arthritis (CIA) mice were treated with CGEN-15051 for rheumatoid arthritis. A significant reduction of joint damage was confirmed by histological analysis.

There are over 20 monoclonal antibodies (mAbs) approved in the US for therapeutic usage, but like most drugs they are usually accompanied by a slew of side-effects, often due to their off-target effect on the pathways of the immune system. Many mAbs targeting autoimmune diseases induce immune system suppression which may expose the body to infections, so a therapy which does not provoke an all-out immune response is desirable. Unmet needs in the autoimmune disease arena are driving research into therapeutics that can offer minimal side-effects and more precise pathways within the immune system. Compugen's novel fusion proteins have the potential to target the immune system more precisely, which may minimize serious side-effects.

In 2009, Compugen caught the eye of Pfizer and entered into a 'discovery on demand' collaboration. The deal provided Pfizer with three targets of interest, allowing the pharmaceutical giant access to these potential therapies without them having to perform their own experimental discovery. After an evaluation period, Pfizer will have the right to either seek worldwide licensing for commercial development of these product candidates or continue with more pre-clinical optimization research for future commercialization. This collaboration and others like it may end up providing cost-savings to larger biopharmaceutical companies. Providing products which have been designed based on probability of success by using an innovative technology platform might decrease research and development spending. If the Pfizer deal is successful and Compugen continues to discover innovative biological drug candidates, the financial savings may provide the impetus for large biopharmaceutical companies to collaborate with Compugen.