FORM 6-K
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Report of Foreign Private Issuer

Pursuant to rule 13a-16 or 15d-16 of the Securities Exchange Act of 1934
for the month of November 2010

Compugen Ltd.
(Translation of registrant's name in English)

72 Pinchas Rosen Street, Tel-Aviv 69512, Israel
(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F X Form 40-F ___

On November 22, 2010, Compugen Ltd. (the "Registrant") issued a Press Release, filed as Exhibit 1 to this Report on Form 6-K, which is hereby incorporated by reference herein.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Compugen Ltd.
(Registrant)
By: Ms. Dikla Czaczkes Axselbrad
Title: Chief Financial Officer
Date: November 22, 2010

Compugen Announces Discovery Platform for New Members of Protein Families with Known Therapeutic Applications

Platform development resulted in nine predicted novel members of B7/CD28 Protein Family

B7/CD28 molecules, including CGEN-15001, to be further researched under expanded arrangement with Northwestern University

Tel Aviv, Israel, November 22, 2010 --- Compugen Ltd. (NASDAQ: CGEN) announced today the development of its Protein Family Members Discovery Platform, designed for the discovery of novel protein members belonging to various known and clinically important protein families. Analysis of the *in silico* prediction and selection results for the B7/CD28 protein family, the first of three such families selected for validation activities for the new platform, resulted in the identification of nine molecules predicted to be currently unknown members of this intensely and widely studied protein family. Five of these nine molecules were identified in the initial analysis, and an additional four were subsequently identified with the benefit of additional insights gained due to those initial discoveries. The other two protein families selected for platform validation activities have not been disclosed.

In many cases, when a protein belonging to a specific biological family is found to show promise as a drug or drug target for therapy for a specific disease or a group of diseases, this leads to a substantial effort by the biopharmaceutical industry and academic community to find additional members of such family that could serve as new drugs or drug targets. However, traditional experimental or bioinformatics-based approaches are often not sensitive enough to detect new members. Therefore, Compugen used its proprietary predictive biology capabilities to develop a platform designed for the systematic discovery of novel protein members belonging to clinically important protein families.

Proteins belonging to the B7/CD28 co-stimulatory family are known to play a key role in regulating immune response, and therefore are expected to have significant clinical potential in many pathological conditions, including autoimmune diseases and cancer. Although of significant industry interest, when relying on traditional discovery methods, the discovery of new B7/CD28 protein family members has, in general, proven to be a very challenging task. Therefore, the B7/CD28 family was one of the three protein families selected for development and validation of the Protein Family Members Platform; the other two protein families were selected for similar reasons.

CGEN-15001, the discovery of which was recently disclosed by Compugen, was one of the nine molecules predicted to be members of the B7/CD28 family, and was the first of these predicted molecules to undergo extensive validation. In initial studies under the direction of Professor Stephen Miller from Northwestern University, a world expert in the field of multiple sclerosis, CGEN-15001 demonstrated significant therapeutic potential for multiple sclerosis. The results of additional recently completed studies, also performed in Professor Miller's laboratory, have now further clarified that the significant beneficial effect of CGEN-15001 in the disease is due to induction of immune tolerance, demonstrated by the inhibition of epitope spreading, the underlying

phenomenon which causes the relapsing nature of the disease. Furthermore, it has been shown that the dramatic beneficial effects observed with CGEN-15001 in the animal model for multiple sclerosis are also accompanied by inhibition of infiltration of reactive T lymphocytes into the central nervous system.

In order to further develop CGEN-15001 and to undertake validation activities with certain of the other eight predicted B7/CD28 molecules, Compugen also announced today that it has recently expanded its engagement with Professor Miller and Northwestern University. With respect to CGEN-15001, this expanded arrangement will include experimentation to provide additional mechanistic and efficacy data required to advance CGEN-15001 toward human clinical testing as a therapeutic agent for multiple sclerosis and other autoimmune diseases. With respect to the other molecules predicted to be members of the B7/CD28 protein family, the program will include both *in vitro* and *in vivo* animal disease models designed to evaluate their potential in various autoimmune diseases.

Dr. Zurit Levine, vice president of R&D at Compugen, stated, “We are very enthusiastic regarding the potential of this new platform and look forward to both validating additional novel molecules predicted and selected to date, and pursuing additional protein families of high interest. With respect to CGEN-15001, we believe this novel molecule has the potential to be superior over existing drugs for the treatment of MS and possibly other autoimmune diseases. CGEN-15001 inhibits Th1/Th17 while promoting Th2, thereby inhibiting undesired inflammatory responses while promoting beneficial immune responses. Also, due to its induction of immune tolerance, a very desirable trait among agents for treating autoimmune diseases, CGEN-15001 can provide long-term benefits and enhanced potency.”

About the Protein Family Members Discovery Platform
This platform incorporates two of Compugen's proprietary infrastructure capabilities: LEADS and MED. LEADS provides a comprehensive predictive view of the human transcriptome, proteome and peptidome and enables the discovery of novel genes and proteins. MED provides a broad understanding of the expression levels of genes across a wide variety of tissues and disease states. Specialized algorithms designed for identification of the unique characteristics of specific protein families, utilizing the LEADS and MED data, analyze the entire proteome to search for novel proteins belonging to the desired protein family. These unique algorithms reflect a deep understanding of the biology of distinct protein families and computationally model the unique characteristics of desired protein families.

About the B7/CD28 protein family
Members of the B7/CD28 family have been intensively studied over the past decade and have brought much excitement to the field of immune regulation. The activation and development of an adaptive immune response is initiated by the engagement of a T-cell antigen receptor with an antigenic peptide-MHC complex. The outcome of this engagement is determined by both positive and negative co-stimulatory signals, generated mainly by the interaction between the B7 family and their receptor CD28 family. Research indicates that the dysfunction of immune regulation contributes to the development of autoimmune diseases. Positive and negative co-stimulatory pathways are critical in immune regulation and are considered potential targets for modulating chronic inflammation in autoimmune diseases. To date, one soluble recombinant fusion protein, that selectively blocks the co-stimulatory signal mediated by the B7/CD28 pathway, has been approved in the U.S. for the treatment of moderate to severe rheumatoid arthritis and is in clinical trials for other autoimmune indications. In addition, a number of clinical and preclinical studies of this protein family are underway at various companies.

About Compugen
Compugen is a leading drug and diagnostic product candidate discovery company. Unlike traditional high throughput trial and error experimental based discovery, Compugen's discovery efforts are based on *in silico* (by computer) product candidate prediction and selection utilizing a broad and continuously growing infrastructure of proprietary scientific understandings and predictive platforms, algorithms, machine learning systems and other computational biology tools to address important unmet therapeutic and diagnostic needs - either for Compugen or its partners. Compugen's growing number of collaborations covering the further development and commercialization of Compugen discovered product candidates all provide Compugen with potential milestone payments and royalties on product sales or other forms of revenue sharing. These collaborations may be entered into before product candidate discovery is undertaken pursuant to "discovery on demand" type arrangements, or with respect to existing product candidates, collaborations can be initiated prior to or at the proof of concept stage, or after additional preclinical activities have been undertaken by Compugen. In 2002, Compugen established an affiliate, Evogene Ltd. (www.evogene.com) (TASE: EVGN.TA), to utilize certain of the Company's *in silico* predictive discovery capabilities in agricultural biotechnology. For additional information, please visit Compugen's corporate website at www.cgen.com.

This press release may contain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These statements include words such as "may", "expects", "anticipates", "believes", and "intends", and describe opinions about future events. These forward-looking statements involve known and unknown risks and uncertainties that may cause the actual results, performance or achievements of Compugen to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Some of these risks are: changes in relationships with collaborators; the impact of competitive products and technological changes; risks relating to the development of new products; and the ability to implement technological improvements. These and other factors are identified and more fully explained under the heading "Risk Factors" in Compugen's annual reports filed with the Securities and Exchange Commission.

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