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Xencor Receives SBIR Phase II Grant for High Throughput Screening of Novel Computationally Derived Optimized Proteins

(BW Healthwire)–June 19, 2001—Paves the Way for Improved Biopharmaceuticals and New Industrial and Agricultural Products Xencor today announced that the company has been awarded a $500,000 Small Business Innovation Research (SBIR) Phase II grant from the National Science Foundation. The grant will allow Xencor to further develop its enabling technology for computer directed high-throughput screening of proteins. This new technology in conjunction with Xencor's proprietary Protein Design Automation™ (PDA™) technology, will be used to create the next generation of biotechnology products tuned for specific applications, such as more effective and robust proteins for chemical processing, new agricultural products, and more potent biopharmaceuticals, according to Bassil Dahiyat, Ph.D., president and chief executive officer of Xencor. "This grant will allow us to develop a high-throughput assay system to test the thousands of computationally validated sequences that can be quickly generated with our PDA technology," Dr. Dahiyat said. "The PDA technology can predict the possible amino acid sequences that will fold into the three-dimensional structure of a protein. This sequence diversity contains protein configurations with novel properties. The technology optimizes these properties, including activity, binding affinity and specificity, stability, expression level, and potency to create more effective proteins for biopharmaceuticals, chemicals, and agricultural products." In its SBIR Phase I study, Xencor used xylanase as a model protein to validate the power of its PDA technology. With the protein structure identified, PDA was used to uncover molecules that had the same sequence, but novel properties. Xencor found sequences that were more active than the wild-type protein and one that had a different pH profile. These results were achieved by testing only 260 of 110,592 predicted sequences. In turn these 110,592 sequences were predicted as compatible with the three dimensional structure by computationally testing over 10(25)(a) possibilities. The findings of the SBIR Phase I study, titled, "Computer-Directed High Throughput Screening For Thermostable, Alkaline-Active Xylanase," was presented at the 8th International Conference on Biotechnology in the Pulp and Paper Industry in Helsinki, Finland earlier this month. "The enormous biological diversity that PDA™ screens computationally is unreachable by older, solely experimental methods," Dr. Dahiyat added. "To screen the 10(80)(a) sequences accessible to PDA, directed evolution methods would require the generation of a protein library greater than the mass of the universe. This fundamental limit constrains in vitro techniques to approximately 10(10)(a) sequences, 70 orders of magnitude less than PDA. The breadth of the computational search allows the creation of proteins with dramatic improvements relative to natural proteins and previously unrealizable features, opening new markets to biotechnology." Under the Phase II grant, Xencor will develop a high-throughput assay system that will allow the testing of the majority of predicted sequences identified using its PDA technology. Xencor will also broaden the predictive power of the PDA algorithm, and perform alternate re-designs of xylanase to systematically explore the full range of possible sequences for optimized xylanases. Xencor's proprietary in silico PDA technology is the first and only method to combine advanced computational methods, the power of high performance computing and experimental screening to optimize proteins. It overcomes the limitations of natural and directed evolution by elegantly merging supercomputing with experimental screening to search the entire range of potential protein sequences for improved proteins. The PDA technology's ultra-high throughput in silico prescreening reduces the number of candidate proteins that require experimental testing, saving significant time and cost compared to solely experimental techniques. Novel sequences with new attributes are created, resulting in new intellectual property. Xencor, a privately-held company, is focused on using its cutting edge protein analysis and optimization technologies to accelerate the discovery of therapeutic proteins and novel compounds. With its proprietary ProCode™ and Protein Design Automation™ (PDA™) technologies, Xencor scientists can rapidly determine the interactions and functions of a cell's entire protein complement, identify proteins of interest, and then optimize key properties of these proteins to fit commercial applications. The use of these technologies alone or in combination will accelerate the compound identification and development programs of Xencor's strategic partners in the pharmaceutical, biotechnology, agricultural and chemical industries. Xencor is headquartered in Monrovia, Calif. Note to Editors: Numbers appearing in parens followed by (a) should be considered exponents.