

drug discovery

Alchemia's drug discovery technology takes a novel approach to identify and optimise active molecules. With Alchemia's approach, no information about the active site of a target is needed and it is not necessary to screen millions of compounds to cover the potential diversity of targets' active sites. Alchemia's approach has been to design compounds using computers and then synthesize them such that each compound has a unique structure and, collectively, the compounds cover the diversity of 'drug-like' space. The completion of this 'array' of compounds was achieved in the middle of 2009.

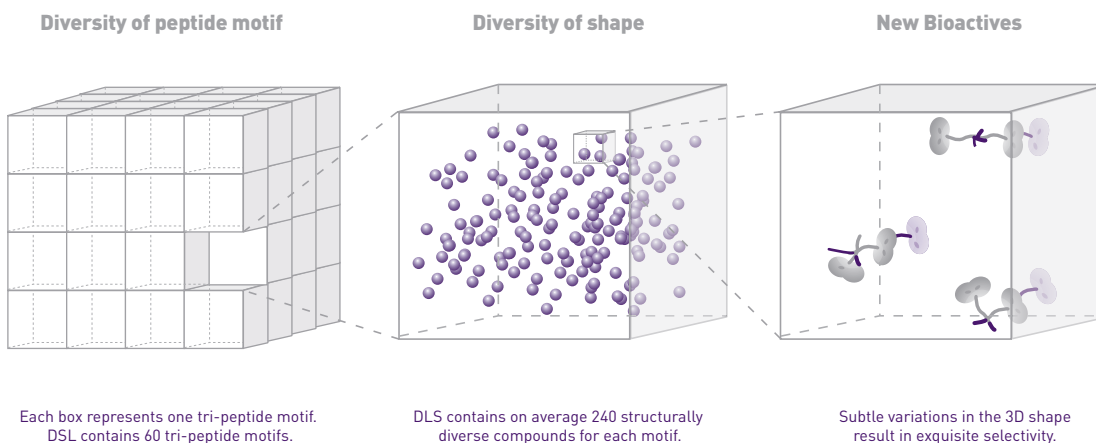
Nature's diversity systematically arrayed on Alchemia's VAST® small molecule scaffolds

Alchemia has developed a systematic approach to small molecule drug discovery that does not require any structural information on the target, its ligand or the functional chemical groups required for interaction. In the past year Alchemia completed a unique Diversity Scanning Library (DSL) of 14,500 individual small molecules, built using its VAST® technology platform. The design of this library was based on mimicking

nature's diversity in a systematic manner, covering a wide variety of amino acid sequences (systematic functional diversity) displayed in multiple conformations (systematic diversity of three dimensional shapes). The library is particularly useful for the discovery of new bioactives for therapeutic targets such as peptide-binding GPCRs (G-protein coupled receptors), which constitute a large family of receptors involved in a wide variety of biological functions and where the structure of the target is not known. Around one half of currently marketed drugs target GPCRs and this continues to be an area of great interest to the pharmaceutical industry.

Rapid optimisation to novel drug leads

Screening of the DSL helps to identify active molecules for a very diverse range of targets, that can be further optimised using the established VAST® synthetic technology to create highly selective and novel lead molecules for drug discovery programs. Alchemia's chemistry is novel, patented and highly modular. This enables the rapid synthesis of molecules with enhanced characteristics following the discovery of 'hits' from an initial screen.



Outlook

The technology is expected to generate mid to long term commercial opportunities for the Company through drug discovery partnerships. We aim to establish a number of drug discovery collaborations in areas where our technology offers the greatest competitive advantage, with a particular interest in modulation of GPCRs. Developments in GPCR pharmacology over the past decade have revealed a great deal of complexity and emphasised a general lack of understanding of the target binding site. We aim to apply DSL and VAST® discovery to specific therapeutic areas through drug discovery collaborations.

Alchemia's drug discovery activities were significantly reduced during the year as part of the cost reduction program. The completion of the DSL was achieved despite these cuts and is now available for screening. Internal drug discovery programs that planned to use the DSL to discover proprietary drugs at Alchemia have been cut although obligations to external collaborators such as Euroscreen S.A. and UQ have been met or are ongoing.

Respiratory disease research

The VAST® drug discovery approach achieved an important milestone in the collaborative project with Euroscreen. In the respiratory therapeutic area, we demonstrated ex-vivo efficacy of a lead VAST® compound in human lung tissue, thereby validating the new approach of targeting an unknown allosteric binding site of a GPCR. Whilst the results of this program were extremely encouraging the project has been placed on hold following the implementation of the Group's prudent cash management strategy in late 2008.

Pain research

Alchemia's collaboration with the Pain Research Group at the University of Queensland progressed further during the year with VAST® compounds showing promising characteristics in early models in terms of improved side effect profile compared with current opioid therapeutics.

Alchemia's board and management remain confident the Company will deliver commercial outcomes from its drug discovery technology to ultimately enhance shareholder value.