



atugen and AstraZeneca announce functional genomics collaboration

Berlin, Germany, and London, UK. 16 October, 2001 - atugen AG and AstraZeneca PLC (NYSE: AZN) today announced a broad collaboration to utilise atugen's GeneBloc® technology to enhance the efficiency of target validation and drug development in a number of major disease areas of interest to AstraZeneca's global research. The two companies previously completed a successful target evaluation agreement, signed in August 1999.

Under the terms of the new agreement, atugen will develop GeneBlocs that inhibit expression, both *in vitro* and *in vivo*, of specific gene targets selected by AstraZeneca. atugen and AstraZeneca will jointly analyse the effects of the GeneBlocs in a variety of pharmacological assays and in animal models of disease. atugen will retain all rights to the GeneBlocs developed and will have an option to licence certain intellectual property generated in the collaboration. AstraZeneca will have the opportunity to expand the one year agreement into a multiyear collaboration to functionalise and validate their extensive pool of genomic targets.

The cost of developing a new drug is on average \$800 million; 75% of this cost can be attributed to failures along the way. The sequencing of the human genome has produced a vast number of novel gene targets that need fast and reliable validation for therapeutic efficacy at an early stage in order to avoid a subsequent increase in this cost. atugen believes that through its proprietary GeneBloc® technology it can help pharmaceutical partners select the gene targets of therapeutic value from the thousands of novel genes recently discovered, thus resulting in a decrease in the number of product failures and a subsequent reduction in the cost of developing new drugs.

atugen's GeneBloc® technology is based on the delivery of specially designed oligonucleotides that reduce expression of target genes *in vitro* and *in vivo*, thus inhibiting protein production, and hence affecting a biological function. The direct correlation between reduction in target gene expression and effects on cellular function in *in vitro* and *in vivo* models of disease rapidly provides the validation required to move the target into drug screening and development. atugen's proprietary delivery reagents carry the GeneBlocs into the cells of interest, allowing for optimal inhibition of gene expression over many days with the least amount of unwanted side effects. In addition to providing rapid target validation, the GeneBlocs can further aid at various stages of the drug screening and development pipeline, for instance by serving as benchmark compounds during lead optimisation and preclinical development.

"We are pleased that AstraZeneca, considered one of the most innovative pharmaceutical companies, has recognized atugen's GeneBloc technology as a means of cutting the cost and time taken to develop new drugs targeted against novel gene targets," said Dr Zisi Fotev, VP of Business Development of atugen. "We are confident that our approach to validating gene targets will be a great asset to AstraZeneca's research and development program by providing a fast and high quality technology. We anticipate a fruitful and long relationship."

Dr John Stageman, VP, Enabling Science and Technologies of AstraZeneca said, "It is our expectation that atugen's antisense technology will play an important role in the process of selecting gene targets of therapeutic value from the thousands of novel genes recently discovered and in further validation of gene targets already of interest. Use of this technology should result in lower attrition rates and important savings in time and research costs for AstraZeneca."



AstraZeneca is a major international healthcare business engaged in the research, development, manufacture and marketing of ethical (prescription) pharmaceuticals and the supply of healthcare services. It is one of the top five pharmaceutical companies in the world with 2000 healthcare sales of \$15.8 billion and leading positions in sales of gastrointestinal, oncology, anaesthesia including pain management, cardiovascular, central nervous system (CNS) and respiratory products. The company's Internet site is www.astrazeneca.com.

atugen is a German biotech company with its headquarters in Berlin, Germany and a subsidiary in Boulder, Colorado, USA. Using its GeneBloc[®] technology, atugen aims to discover and validate pharmaceutical targets faster than other technologies. atugen's mission is to provide its partners with cost-effective high throughput target analysis, as well as *in vitro* and *in vivo* validation. This will accelerate the development of novel drugs in its customers' laboratories and in its own independent research focused on finding cancer targets down stream from tumour suppressor genes. atugen provides target discovery and validation services to, Axys Pharmaceuticals, Bayer, Roche BioScience, BASF, Boehringer Ingelheim, Millennium, Schering AG and its US affiliate, Berlex Pharmaceutical Corporation, and Serono.

For further information, contact:

atugen

Dr Zisi Fotev

Tel: +49-30 9489 2725

Fax: +49-30 9489 2701

Email: fotev@atugen.com

NoonanRusso Ltd

Dr Don O'Sullivan

Email: d.o'sullivan@noonanrusso.co.uk

AstraZeneca UK Ltd

Dr Jonathan Turner

Tel : + 44 1509 645 147

Fax : + 44 1509 645 598

Email : jonathan.turner@astrazeneca.com