Exploring the 'Davids and Goliaths' of therapeutic molecules

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Two research units under Singapore's Agency for Science, Technology and Research (A*STAR), the Experimental Therapeutics Centre (ETC) and Singapore Immunology Network (SIgN), are collaborating with Italy's Siena Biotech S.p.A. to develop new drugs and targeted antibodies respectively, which will potentially help millions of cancer and bone loss patients across the world. This is the fifth major collaboration A*STAR has with research centres and universities in Italy.

Small molecule for cancer therapy

ETC and Siena Biotech are developing molecular inhibitors of a major signalling pathway in oncology to target difficult-to-treat forms of cancer such as gastric cancer, leukaemia and brain tumours. During this collaboration, up to six groups from ETC and some 30 scientists from Siena Biotech will be conducting tests on synthetic compounds to characterise and optimise their inhibitor function in cancer cells. A drug is expected to enter clinical trials in 2011.

Targeted forms of cancer therapy have gained significant interest since the late 1990s. They employ small molecules that inhibit mutated, overexpressed, or otherwise critical proteins characteristic of a particular cancer cell, rather than non-specifically inhibiting and killing of all rapidly dividing cells within the body. ETC and Siena Biotech's molecular inhibitors may improve the prognosis for a very significant number of cancer patients, given that gastric cancer is the fourth most

common cancer in the world and the second leading cause of cancer death. Gastric cancer is also one of the most common in Singapore (fifth highest in men and seventh highest in women, according to the Singapore Cancer Registry), with over 600 cases diagnosed every year.

"ETC is committed to translating early-stage scientific discoveries into practical applications," said Prof Alex Matter, CEO of ETC and leader of the research team that discovered the first targeted anti-cancer drug, Gleevec . "Leveraging on our technological know-how and the industry experience of Siena Biotech, we expect our partnership to spark new breakthroughs for cancer research. We especially appreciate the power of collaboration in the dynamic arena of cancer drug discovery."

Large molecule to treat bone diseases

SIgN and Siena Biotech are jointly developing a novel monoclonal antibody applicable to bone diseases such as osteoporosis. Under the agreement, Siena Biotech will characterise, develop and test the effectiveness of the monoclonal antibodies while SIgN will isolate the disease-specific human monoclonal antibody from a pool of tens of billions of polyclonal antibodies.

SIgN and Siena Biotech's antibody is another example of the world-class research being done on targeted disease therapies. The monoclonal antibody is intended to block a specific extracellular component in the molecular pathway that leads to bone loss, and thus stop the disease progression. If successful, it would reduce the risk of bone fractures and hence the associated healthcare costs for those suffering from various forms of bone frailty. Osteoporosis alone is estimated to afflict 1 in 3 women and 1 in 12 men over the age of 50 worldwide.

SIgN Chairman, Prof Philippe Kourilsky commented, "It is thanks to the excellent relationship that Singapore shares with Italy that we can

collaborate in the often-neglected area of bone and tissue loss. Together with Siena Biotech, we will be using some of the world's most advanced molecular biology and antibody engineering techniques to hopefully make good progress in this area of research, and meet the dire healthcare needs of the world's ageing population."

"The strong synergies derived from shared commitment and knowledge coupled with complementary technology platforms between ETC, SIgN, and Siena Biotech will accelerate the development of novel therapies in difficult to treat diseases making them quickly available to the patients," said Dr Giovanni Gaviraghi, CEO of Siena Biotech.

"We are delighted that new scientific collaborations have been agreed between Siena Biotech and A* STAR. The common vision between A* STAR and the Fondazione Monte dei Paschi di Siena, to evolve and develop of their local economies, has been one of the pillars of the collaboration which we hope will bring new and effective medicines to the patients," added Marco Parlangeli, President of Siena Biotech and General Manager of Fondazione Monte Paschi di Siena.

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