

Astellas, KEK sign deal for neglected diseases research

26 September 2012 | News | By BioSpectrum Bureau

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Singapore: The High Energy Accelerator Research Organization (KEK) and Japan-based Astellas Pharma have concluded an agreement to begin collaborative research to discover new drugs for the treatment of neglected tropical diseases through the use of synchrotron X-ray crystallography.

Neglected tropical diseases, prevalent mainly in poor remote rural areas, are infectious diseases spread by parasites or bacteria. Approximately one billion people are affected worldwide and some 500,000 die each year as a result. These diseases are a serious healthcare issue that is being addressed on a global scale.

A valuable approach to new drug development that has evolved rapidly in recent years is the design of pharmaceuticals based on the three-dimensional structure of proteins. This method involves designing drugs for the target protein by analyzing and comparing the structure of various compounds and complex conjugates in order to develop an overall understanding of the mechanism by which protein activity is inhibited (or activated).

Since 2006, KEK and Astellas have been progressing drug discovery research using synchrotron X-ray beams. The synchrotron radiation beam produced in the Photon Factory in KEK has high-brilliant and high-energy properties conferring advantages such as the ability to conduct experiments on small crystals that would have been difficult to analyze using conventional X-rays and to acquire data in an extremely short period that would otherwise take vast amounts of time.

The target of this research is infectious diseases caused by parasitic protozoans, namely leishmaniasis, Chagas disease and Sleeping sickness, and will be divided into two major phases. The first phase involves elucidating the three-dimensional structure of parasitic protozoan proteins that are potential drug targets, allowing the identification of inhibiting compounds that block the action of pathogenic proteins. The second phase consists of the structural analysis of target proteins in complex with the inhibitory compound. Crystallization robots and dedicated beamlines developed by KEK will be employed with structural analysis performed efficiently and over a short time period.

Structural data obtained through the successful application of this collaborative research will contribute to the discovery of

new drugs for the treatment of parasitic protozoan diseases.