Press Release

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Harmless or lethal? Insilico Furthers Research on Fungal Infections

(Stuttgart) – *Candida albicans* is a harmless yeast fungus – at least most of the time. However, if the immune system is weak, then the fungus normally found on everyone's skin and mucous membranes can become a lethal threat. Insilico Biotechnology is participating in a joint project funded by the German Federal Ministry of Education and Research (BMBF), in which interactions between fungus and human host cells are to be studied on the molecular level with the aim of developing new strategies for the prevention, diagnosis and therapy of fungal infections.

Candida albicans is just one of the many organisms which belong to the normal microflora on the human skin and mucous membranes (e.g. mouth and intestinal tract). When a person is in a healthy state, the fungus is kept under control by the immune system and poses no problems. However, if the immune system has been weakened by illness, an operation, antibiotics or chemotherapy then the fungus can change from Dr. Jekyll to Mr. Hyde. Candida infections can spread throughout the entire body and damage inner organs irreparably with lethal effects. Up to 70 percent of all fungal infections found in hospitals are caused by *Candida albicans* which underlines the medical relevance of this organism.

How does the fungus influence the immune response of human host cells and how do host cells influence the metabolism of the fungus? What conditions must incur for their harmless coexistence to become out of balance? Which factors and metabolic processes are responsible for illnesses and how are these regulated on the molecular level? Conclusive answers to all these questions will be sought in the project with Insilico bringing in its renowned expertise in modelling and simulating cell metabolism.

The cooperative research project has been designed to match data from experiments and computer models continuously so that they complement each other. The course of an infection will be simulated in cell cultures under controlled conditions and the biomolecules present will be analysed qualitatively and quantitatively at all infection stages. Insilico will use this data to reconstruct, simulate and visualise the infection process with high-performance computing in close cooperation with its project partners.

This will lead to the very first comprehensive picture of the complex relationship between host and fungus. Insilico Biotechnology and its partners hope that they can then identify markers to detect the threat of an invasion on host tissue at a very early stage. Insilico simulations will be used to find out how processes can be influenced from the outside e.g. through the virtual addition of agents which influence certain targeted biochemical reactions. New forms of diagnosis and therapy will then be within grasp.

The cooperative project with eight partners is being carried out under the direction of the Helmholtz Center for Infection Research and will last initially for three years. The BMBF is funding the project during this period with a total of three million euro.

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Insilico Biotechnology designs and optimises biotechnological processes for the chemical and pharmaceutical industries. Successful in business since 2001, Insilico has internationally renowned expertise and a unique technology platform for connecting cell model libraries with simulation processes. Insilico analyses the latest biotech data and integrates it in genome-wide network models. With high-performance computing techniques, Insilico develops new improved solutions for manufacturing biochemicals and biopharmaceuticals and achieves considerable cuts in the time needed for the development of bioprocesses. Insilico is a privately-owned company, located in Stuttgart, Germany.

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