Yeast holds clues to Parkinson's disease

September 9 2010

Yeast could be a powerful ally in the discovery of new therapeutic drugs to treat Parkinson's disease says a scientist presenting his work at the Society for General Microbiology's autumn meeting in Nottingham today.

Dr Tiago Fleming Outeiro from the Instituto de Medicina Molecular in Lisbon, Portugal describes how his group is slowly uncovering the molecular basis of Parkinson's disease by studying the associated human protein in yeast cells.

Parkinson's disease is a neurodegenerative disorder without any known cure that affects around 6 million people worldwide. The symptoms, which include rigidity, difficulty in initiating movements and resting tremors, are all related to the specific death of dopamine-producing neurons in the brain. These neurons characteristically contain protein deposits, known as Lewy bodies. A small protein called alpha-synclein is the main component of these deposits.

Dr Outeiro explains how baker's yeast, Saccharomyces cerevisiae, is helping researchers learn how alpha-synuclein might lead to Parkinson's disease. "Yeast is a very simple but powerful model in which to study how alpha-synuclein actually works as, remarkably, many of the biochemical pathways involved are similar between yeast and humans," he said. "There is still a lot we don't know about the function of this protein, but we do know that even small increases in the level of alpha-synuclein in cells lead to cell death."

Dr Outeiro, along with colleagues in the USA, screened a library of 115,000 small compounds to try and identify those that are able to block the toxic effects of alpha-synuclein. Several of these molecules have proved effective in preventing Parkinson's disease in worms and blocking alpha-synuclein toxicity in rat neurons. If developed further, they could form the basis of future drugs to treat Parkinson's disease in humans.

New treatments for neurodegenerative diseases are urgently needed. "With the ageing of the human population the number of people affected by Parkinson's disease will continue to increase. This means the disease will become an even greater problem for modern societies due to the tremendous socio-economic costs associated," Dr Outeiro said. "It's therefore imperative that treatments for such neurodegenerative diseases are developed. Our studies in yeast have enabled us make a step towards this."

Provided by Society for General Microbiology