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Research promising for cystic fibrosis

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New University of Toronto research holds promise for developing innovative therapies against cystic fibrosis and may also serve as a model for future therapies against the HIV virus.

Led by Professor Igor Stagljar, University of Toronto scientists have identified several compounds that block activity of a key protein (exoenzymeS or ExoS). One of these compounds, exosin, significantly inhibited infections in mammalian cells, showing promise for increasing the effectiveness of antibiotics in the treatment of chronic and acute bacterial respiratory infections in cystic fibrosis patients.

Past studies have shown it is possible to prevent or delay the onset of certain chronic or deadly infections in cystic fibrosis patients with early antibiotic treatment. But the current availability of antibiotics against Pseudomonas aeruginosa, a pathogen that can cause urinary tract infections, respiratory system infections, dermatitis, soft tissue infections, bacteremia, bone and joint infections, gastrointestinal infections and a variety of systemic infections, is limited and the pathogen shows signs of drug resistance.

In an article published in the online edition of the journal PLoS Genetics, a team of investigators, including first author and U of T graduate student Anthony Arnoldo, identified several drugs that block a Pseudomonas aeruginosa toxin called ExoS.

"These studies created a road map to the rational design of more potent, highly selective inhibitors against other similar toxins using a totally

novel yeast-based approach," says lead author Stagljar. “This innovative approach is an important advance, not only for the value it may have in cystic fibrosis treatment, but also because this technique could be used to design novel therapies for any bacterial pathogen as well as the HIV virus.”

In the next phase of their research, Stagljar and his colleagues plan to test the action of their inhibitors in an animal model of cystic fibrosis. If successful, the therapeutics may provide an avenue for the treatment of this debilitating disease.

Source: University of Toronto

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