Nanotech improves cystic fibrosis antibiotic by 100,000-fold
13 May 2021

"CF is a progressive, genetic disease that causes persistent, chronic lung infections and limits a person's ability to breathe," Thorn says.

"The disease causes thick, sticky mucus to clog a person's airways, attracting germs and bacteria, such as Pseudomonas aeruginosaa, which leads to recurring infections and blockages.

"Tobramycin is commonly used to treat these infections but increasingly antibiotics are failing to make any significant difference to lung infections, leaving sufferers requiring life-long antibiotic therapy administered every month.

"Our research successfully treats advanced human cell culture lung infections using nano-enhanced Tobramycin and shows how it can eradicate serious and persistent infections after only two doses.

"This could be a real game-changer for people living with CF."

Researchers enhanced the Tobramycin with a biometric, nanostructured, lipid liquid crystal nanoparticle (LCNP)-based material, testing it on a new lung infection model to showcase its unique ability to penetrate the dense surface of the bacteria and kill the infection.

Dr. Nicky Thomas, who is supported by a Mid-Career Fellowship from The Hospital Research Foundation Group, says the discovery continues the global battle to eradicate and prevent Pseudomonas aeruginosaa.

Tobramycin works by inhibiting the synthesis of bacteria and causing cell membrane damage. Yet, as it's a concentration-dependent antibiotic, achieving a sufficiently high concentration is critical," Dr. Thomas says.
"Our technology improves the performance of Tobramycin without increasing the toxicity of the drug, so what we're doing is a far more effective and efficient treatment for chronic lung infections."

The technology is currently entering pre-clinical trials and hopes to be on the market in the next five years.


Provided by University of South Australia

*This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.*