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Scientists make progress infight against slimy bacterial infections

Toronto, Canada - A team of researchers at the Hospital for Sick Children in Toronto, Canada have taken an important step towards understanding bacterial “slime” infections. Scientists obtained the first atomic image of a component of a bacterial machine that makes alginate, a complex sugar that helps bacteria cause these infections in cystic fibrosis patients. Cystic fibrosis (CF) is a genetic disease causing a patient’s lungs to malfunction, leaving them highly susceptible to bacterial infections. The main culprit responsible for these infections is *Pseudomonas aeruginosa* which causes debilitating biofilm infections that persist for years and lead to progressive lung damage. A biofilm is a community of bacteria attached to a surface and covered in a thick slime. Biofilm infections are notoriously difficult to eradicate because they are more resistant to antibiotics and a patient’s immune system.

Scientists have begun exploring new ways of treating biofilm infections. Dr. Lynne Howell, a senior scientist at the Hospital for Sick Children in Toronto, believes that one way of doing this is to prevent bacteria from forming a biofilm in the first place. Dr. Howell’s research team is studying the production of a sugar chain known as alginate that forms the bulk of *Pseudomonas aeruginosa* biofilms infecting the lungs of CF patients. Scientists believe alginate is produced in bacteria by a large machine made of several components. How this machine works or what it looks like remains a mystery. Recently, Dr. Howell’s lab has obtained the first image of a protein within the machine called AlgK. This image shows that AlgK carries a distinctive pattern suggesting that it plays a role in the assembly of the machine. Dr. Howell and her team are hopeful that their research will lead to the design of novel antibiotics that interfere with alginate synthesis and prevent biofilm infections in the lungs of CF patients.

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