

Structural dissection of streptococcal multi-domain fibrillar adhesins

Supervisory team:

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Project description:

Bacteria are able to survive in almost every environment on Earth, from the deepest oceans to the frozen polar ice caps. They are arguably the most successful form of life on the planet. One of the mechanisms that bacteria use to survive in challenging environments is to produce a family of sticky proteins called adhesins, which are attached to the surface of the bacteria. Bacteria use adhesins to secure themselves to the surfaces of materials, other microorganisms, or the cells of plants, animals and people. Adhesins work by recognising and tightly binding to specific target molecules present on cell and material surfaces, acting very much like biological Velcro. The goal of this project is to try to figure out how two particular adhesins from a family of bacteria called Streptococci are able to recognise and stick to molecules present on the surfaces of human and bacterial cells. This will tell us how these bacteria are able to survive inside people and potentially cause disease. Our plan is to look at the structure of this protein and use this information as a blue print to work out how they are able to recognise and bind their targets. Once we have this information, we hope to be able to design molecules that will block binding and could thus be used as novel preventative treatments for streptococcal infections.