Sugary bugs subvert antibodies

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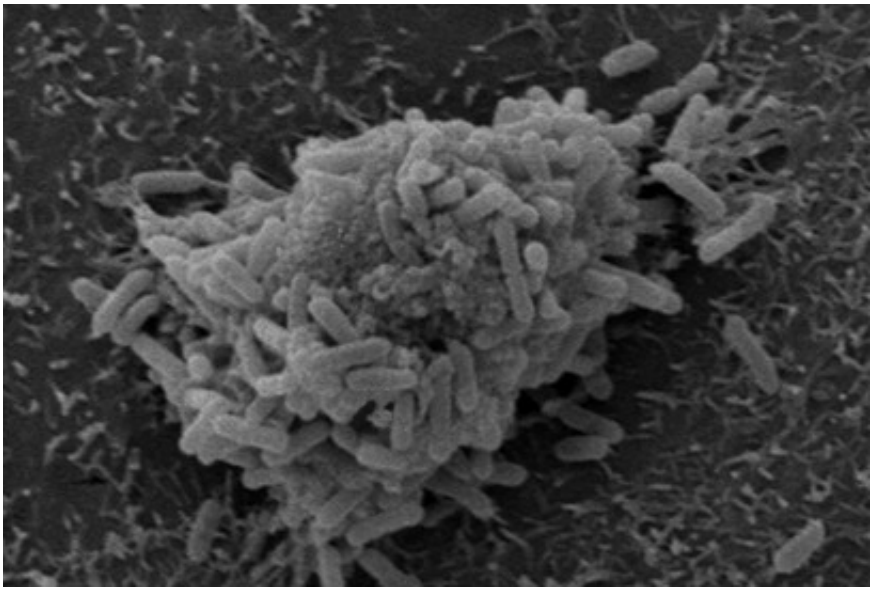

Researchers show how the body's antibody response can protect—not destroy—the bacterium *Pseudomonas aeruginosa* (pictured). Credit: ©Kierbel, A., et al. 2007. *J. Cell Biol.* doi:10.1083/jcb.200605142

A lung-damaging bacterium turns the body's antibody response in its favor, according to a study published in *The Journal of Experimental Medicine*.

Pathogenic bacteria are normally destroyed by antibodies, immune proteins that coat the outer surface of the bug, laying a foundation for the deposition of pore-forming "complement" proteins that poke lethal holes in the bacterial membrane. But despite having plenty of antibodies

and complement proteins in their bloodstream, some people can't fight off infections with the respiratory bacterium *Pseudomonas aeruginosa*. And chronic infection can lead to a condition called bronchiectasis, characterized by persistent cough, shortness of breath, and chest pain.

A group of researchers at the University of Birmingham, England, now find that the antibody response to *Pseudomonas* can get in its own way. In a subset of infected bronchiectasis patients with particularly poor lung function, they noticed an abundance of one specific type of antibody, called IgG2, which stripped the blood of its normal bug-killing capacity. The IgG2 proteins bound to extra-long sugars on the bacterial surface, a feature unique to the bugs infecting these patients. When these sugar-specific antibodies were removed, the blood's antibacterial prowess was restored.

Exactly how these IgG2 molecules protect the bug is unclear, but they may lure complement proteins away from more vulnerable parts of the bacterial surface. The discovery of antibodies that protect the bug instead of the person may help to explain why two vaccines based on these extra-long sugars resulted in worse disease in immunized individuals.

More information: Wells, T.J., et al. 2014. J. Exp. Med. DOI: 10.1084/jem.20132444

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