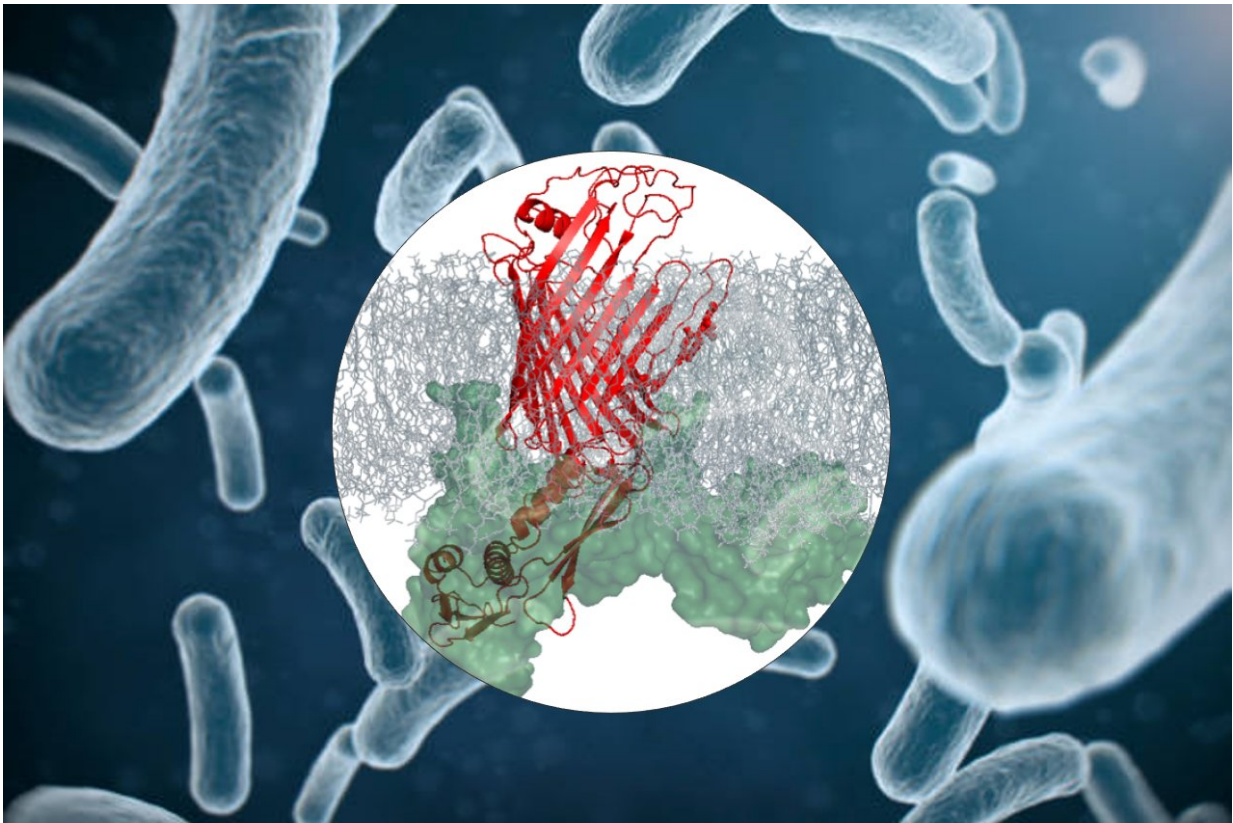


# Novel functional insight in protein complex, possible new target for antibiotics

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The protein complex (red) in the bacterial outer membrane. Credit: Utrecht University Faculty of Science

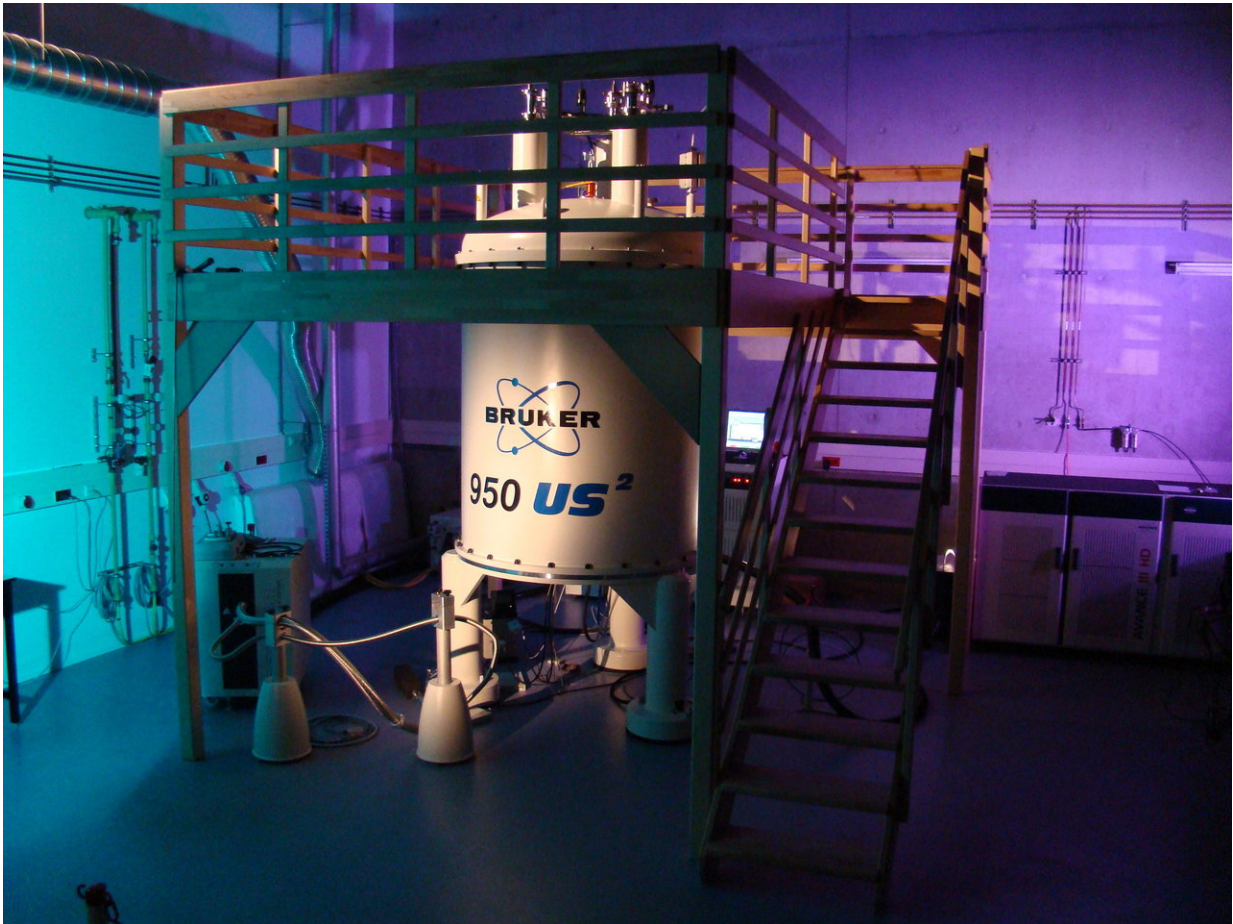
Researchers at Utrecht University have gained new insights into the

structure and function of a protein complex that maintains the outer membrane of a bacteria. Shutting down this protein complex makes it impossible for the membrane to maintain itself, causing the bacteria to die. This protein could present a promising target for novel antibiotics. The researchers will publish their findings in *Nature Communications* on 8 October.

"Many of our current antibiotics kill [bacteria](#) by making a hole in the [outer membrane](#)," says Marc Baldus, professor of NMR Spectroscopy and lead author of the publication. "With this new knowledge, we now know that we can attack the membrane in another way: by preventing the bacteria from maintaining its membrane. It's as if we'd found another way to sabotage a car—not by destroying the engine, but by deactivating the oil pump, which causes the car to overheat and break down on its own."

## Protein complex in action

Scientists have long known that this protein complex plays a role in the bacteria's outer membrane. "But we didn't know exactly what role that was," Baldus explains. The researchers studied the protein complex using NMR, [nuclear magnetic resonance](#) in functional membranes. "It works a bit like an MRI scanner at a hospital, but then at the atomic level. For the first time, we've been able to watch the [protein complex](#) in action, which helps us to better understand how the protein machine works, and that it is essential in keeping the cell alive."



The NMR facility at Utrecht University. Credit: Utrecht University

These insights could lead to new types of antibiotics, Baldus says. "Bacteria that have developed a resistance to current antibiotics are still susceptible to this new area of attack." Antibiotics resistance is a growing problem, and an increasing number of bacteria are able to defend against the available medications. "We'll still need to do a lot more research to develop this new type of antibiotics, but this knowledge is a vital first step forward."

**More information:** Formation of the  $\beta$ -barrel assembly machinery

complex in lipid bilayers as seen by solid-state NMR, Cecilia Pinto, Deni Mance, Tessa Sinnige, Mark Daniëls, Markus Weingarth and Marc Baldus, *Nature Communications*, 8 October 2018, [DOI: 10.1038/s41467-018-06466-w](https://doi.org/10.1038/s41467-018-06466-w)

Provided by Utrecht University Faculty of Science

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