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July 12th, 2018

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Researchers Maria Martins, Filipe Folgosa and Miguel Teixeira. Credit: Instituto de Tecnologia Química e Biológica- ITQB

Clostridium difficile is a pathogenic bacterium that is the cause of intestinal diseases with symptoms ranging from mild diarrhea to severe, potentially lethal, inflammatory lesions such as pseudomembranous colitis, toxic megacolon or bowel perforation. *Clostridium difficile* is an anaerobe that colonizes the human gut, where oxygen is scarce but still present. The mechanism that enables *C. difficile* to survive oxygen and nitrogen was unclear, but now researchers from Miguel Teixeira Lab at ITQB NOVA have described in detail the bacterial enzyme responsible for that process. The results were published in *Scientific Reports*, a Nature group publication.

"Flavodiiron proteins (FDPs) are O₂- or NO-reducing enzymes responsible for the ability of many pathogens to survive a host's immune system. These enzymes also allow anaerobes to cope with fluctuating concentrations of oxygen. What we have now found is that *Clostridium difficile* encodes two of these enzymes, one that is similar to other known FDPs but the other with a larger polypeptide chain, CD1623, with two extra domains," says Miguel Teixeira, leader of Metalloenzymes and Molecular Bioenergetics Lab and corresponding author of this article. "This multi-domain protein is the most complex flavodiiron protein characterized thus far and our results show that it operates as a standalone enzyme, precluding the need for extra partners. Its selectivity to oxygen may be the key to the survival of *C. difficile* in the human gut and in the environment."

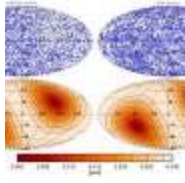
More information:

Filipe Folgosa et al. The multidomain flavodiiron protein from *Clostridium difficile* 630 is an NADH:oxygen oxidoreductase, *Scientific Reports* (2018). DOI: 10.1038/s41598-018-28453-3

Provided by Instituto de Tecnologia Química e Biológica- ITQB

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