Poster Presentation

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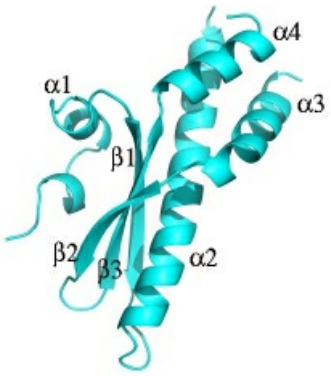
Function from structure: Lpp20 from the human pathogen Helicobacter pylori

Giuseppe Zanotti[1], Francesca Vallese[1], Nigam M. Mishra[1]
[1]*University Of Padua, Padova, Italy*
E-mail: giuseppe.zanotti@unipd.it

Helicobacter pylori is a bacterium that affects about 50% of the world population and, despite being often asymptomatic, it is responsible of several gastric diseases, from simple peptic ulcer to gastric cancer [1]. Moreover, this bacterium lives with humans since ancestral times, but the reciprocal influences of the bacterium on the host and vice-versa are not fully understood and they need more in depth investigation. The development of a vaccine against the bacterium has been sought for long time, at least since few years after the discovery of the bacterium. Several H. pylori proteins of the bacterium have been discovered to be antigenic and eventually proposed to become components of a vaccine. Among the possible target for a vaccine there is a protein called Lpp20 (HP1456), corresponding to the product of gene hp1456 [2]. Lpp20 plays an important role in bacterium development and survival, but its physiological role in the infection has not been clarified yet.
Lpp20 (HP1456) is a liproprotein bound to the external membrane of the bacterium and present in secreted vesicles along with other two proteins of the same operon, HP1454 and HP1457. The crystal structure, determined by SAD using a Se-Met derivative at 1.9 Å resolution, shows a alpha1-beta1-alpha2-alpha3-beta2-beta3-alpha4 topology, with a bent shape. Its fold results to be similar to that of Tip-alpha, a virulence factor from the same bacterium that induces in the host the expression of TNF-alpha and activates the NF-kB pathway [3]. The fact that both proteins are secreted and share a similar architecture have induced us to perform tests in vitro on the effects of Lpp20 on human cells. Cell migration, cell proliferation tests and real-time PCR indicate that Lpp20 is a virulence factor with a behavior similar to that of Tip.
[1] Graham (2015) Gastroenterology 148, 19-31
[2] Keenan et al., (2000) Infect. Immun. 68, 3337-3343
[3] Tosi et al., (2009) FEBS Lett. 583, 1581-1585



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