Abstract Title: Stability and interactome analysis of key components of the Cag-type IV secretion system of *Helicobacter pylori.*

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Abstract:

Helicobacter pylori (*H. pylori*) is the causative agent for numerous gastric maladies. It harbors a unique protein and DNA translocation machinery called the Cag-type IV secretion system (Cag-T4SS). The Cag-T4SS is composed of 27 putative genes and some of them show sequence or structural similarity with *virB* genes of *Agrobacterium tumefaciens*. However, *H. pylori* Cag-T4SS system also includes additional components without any sequence or structural similarity to any other known T4SS system naming few such as CagU, CagN, Cagδ, CagF, CagZ, CagI, CagM and CagD etc. Our detailed research revealed different localization, stability, interactome and functions of two unique components CagU and CagN. CagU (HP0531) is an inner membrane associated protein, partially processed at the C-terminus and interacts with the VirB6 and VirB8 homologues CagW and CagV, respectively. The level of expression of CagU is partially affected in the absence of *cagX*, *cagW* and *cagV*. Deletion of *cagU* aborts surface localization of CagA and affects the expression levels of CagI and CagH that are involved in the Cag-T4SS pilus formation. CagN exists both in the cytoplasmic/periplasmic and membrane associated pools. Deletion of *cagδ*, *cagM* and *cagT* lowers CagN levels whereas the deletion of *cagN* affects the stability of CagM in the Cag-T4SS. We further show that CagN interacts with outer membrane associated components Cagδ, CagM, CagX, CagT and inner membrane associated component CagE. Since deletion of *cagN* affects the stability of CagM, which is absolutely essential for the Cag-T4SS function, we hypothesize that this could be a possible reason of the intermediate effect of *cagN* deletion on the Cag-T4SS function. Overall, our studies add on in depth understanding of structural assembly and function of the Cag-T4SS of *H. pylori*.

Keywords: *Helicobacter pylori*, Cag-type IV secretion system, CagU, CagN.

Professional Biography:

I have completed my PhD in January 2017, thesis entitled- "Studies on *Helicobacter pylori* Cag-T4SS Unique components CagU and CagN" from Jawaharlal Nehru University, New Delhi, India and Master of Science (M.Sc.) (2009-2011) in Life Sciences from the same university. By this month (May 2018), I am going to join University of Alabama at Birmingham, Alabama, USA as a Postdoctoral Research employee.

PUBLICATIONS

1. Kumari R, Shariq M, Kumar N, Mukhopadhyay G. Biochemical Characterization of the Helicobacter pylori Cag-T4SS Unique Component CagU. FEBS Lett. 2017 Jan 19. doi: 10.1002/1873-3468.12564. PMID: 28103624.

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