## Flagellar Motility plays critical role in biofilm formation of *Bacillus cereus* and *Yersinia enterocolitica*

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**Background:** Bacteria live either independently as planktonic cells or in organized surface associated colonies called as biofilms. Biofilms play an important role in increased pathogenesis of bacteria and it is assumed that, motility is one of the contributing factor towards biofilm initiation.

**Aims:** This study was planned to identify the role of flagella in biofilm formation by constructing flagellated (wild type) and physically disrupted variants (non-motile).

**Methods:** Total 10 clinical bacterial strains were screened. Based on morphological variation and motility, only two highly resistant trains were characterized biochemically, physiologically and genetically. Biofilm formation capacity of strains was analyzed using three methods including Congo red assay, test tube assay and liquid-interface coverslip assay. Afterwards, flagellar disintegration was induced by blending and centrifugation for 5, 10 and 15 minutes.

**Results:** Our results showed these strains as *Bacillus cereus* and *Yersinia enterocolitica* identified by 16S rRNA sequencing. Both strains produced significant biofilm by all three above mentioned methods. A motility test of these blended variants showed partial leading to completely diminished motility with increased blending time. The significant loss in biofilm formation after 15 minutes of blending confirmed the important contribution of flagella to the initiation of biofilm formation. This biofilm defect observed in flagella paralyzed/minus variants presumably may be due to defects in attachments to surface at early stages.

**Conclusion:** This study indicated that flagellar motility is crucial initially for surface attachment and subsequently for biofilm formation.

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