

## **A unique mode of bacterial cell-to-cell and gut bacterial-intestinal host cell interaction**

**Gyanendra P. Dubey\* and Bindu Vani Gotla**

Department of Biotechnology and Bioinformatics, School of Life Sciences, University of Hyderabad 500046, India

**\*Correspondence:** Gyanendra P. Dubey, **Email:** [gpdubey\\_rrf@uohyd.ac.in](mailto:gpdubey_rrf@uohyd.ac.in)

**ORC iD - 0000-0001-5725-7278**

### **Abstract**

It is evident that bacteria directly communicate with their encounter parts in an ‘inter-and-intra species’ manner and interact with their host. We have uncovered that, when bacteria reside close by, they interconnect with each other via membranous nanotubes and exchange their cytoplasmic molecules, notably resistance to the antibiotics both in a transient and hereditary manner. I will describe how bacteria physique these nano-tubular networks and their molecular architectures, remarkably independent of classical conjugation. Such bacterial attributes are highly prominent in the host microbiota, where bacteria not only communicate with each other but also interact with the host cells. We grew the premier gut symbiotic bacteria, Segmented Filamentous Bacteria (SFB) in an in vitro environment with intestinal cells and in vivo conditions in germ free mice models. Utilizing higher resolution cell biology tools, we found that only the single-celled intracellular offspring (IOs) harbors flagella. The IOs flagella are specific to their holdfast which attaches with host epithelium, thus regulating almost all the immune systems and host pathophysiology. I believe that such fascinating bacterial physiology are likely to change our view on how molecular cross-talk, and ongoing <<war-and-peace>> between bacteria and host cells, results in the emergence of symbiosis and/or pathogenesis.

**Keywords:** Gut Symbiotic Bacteria, Antibiotics, SFB, IOs