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**MICROBIOLOGY & MOLECULAR GENETICS**

**Departmental Journal Club**

**MICR 6120**

**Monday**

**February 20th, 2017**

11:30am-12:20pm

RM 215 LSE.

Presented by

Prakash Sah
PHD Student

Title:    Direct targeting of membrane fusion by SNARE mimicry: Convergent evolution of Legionella effectors

Authors: Xingqi Shi,Partho Halder,Halenur Yavuz, Reinhard Jahn, and Howard A. Shuman

Legionella pneumophila, the Gram-negative pathogen causing Legionnaires’ disease, infects host cells by hijacking endocytic pathways and forming a Legionella-containing vacuole (LCV) in which the bacteria replicate. To promote LCV expansion and prevent lysosomal targeting, effector proteins are translocated into the host cell where they alter membrane traffic. Here we show that three of these effectors [LegC2 (Legionella eukaryotic-like gene C2)/YlfB (yeast lethal factor B), LegC3, and LegC7/YlfA] functionally mimic glutamine (Q)-SNARE proteins. In infected cells, the three proteins selectively form complexes with the endosomal arginine (R)-SNARE vesicle-associated membrane protein 4 (VAMP4). When reconstituted in proteoliposomes, these proteins avidly fuse with liposomes containing VAMP4, resulting in a stable complex with properties resembling canonical SNARE complexes. Intriguingly, however, the LegC/SNARE hybrid complex cannot be disassembled by N-ethylmaleimide-sensitive factor. We conclude that LegCs use SNAREmimicry to divert VAMP4-containing vesicles for fusion with the LCV, thus promoting its expansion. In addition, the LegC/VAMP4 complex avoids the host’s disassembly machinery, thus effectively trapping VAMP4 in an inactive state.