真菌医学研究センター　Monthly セミナー

平成２７年７月３０日（木）　１６：００～１７：００

東京大学医科学研究所　２号館２階 小会議室

(東京メトロ南北線・都営地下鉄三田線 白金台駅下車)

Dr. Benoit Marteyn

Institut Pasteur, France, Unité de Pathogénie moléculaire et Microbienne

Title: Oxygen modulation of *Shigella flexneri* virulence and neutrophils physiology

Abstract:
Enteric pathogens must survive in the anaerobic environment of the large intestine, and many of them use shared mechanisms to sense lack of oxygen and to enhance their virulence (e.g. Type Three Secretion Systems, T3SSs). *Shigella* spp. are the leading cause of bacillary dysentery, and are able to invade non-epithelial cells in the gastrointestinal (GI) track. During the infectious process, *Shigella* has to resist to neutrophils bactericidal activity, as they represent the most abundant immune cell population recruited during *Shigella* invasion.

Exploiting *in vivo* models (rabbit, guinea pig) and *in vitro* approaches (epithelial cells culture), we have shown that *Shigella* infection is associated with hypoxia induction within the colonic mucosa. We observed that neutrophils recruitment and activation is the leading cause of hypoxia. Additionally, we have shown that neutrophils viability is maintained under anoxic conditions, which promote their bactericidal functions upon infiltration in infected tissues.

We characterized the adaptation of *Shigella* to low oxygen conditions in order to successfully colonize the colonic mucosa. We demonstrated that *Shigella* virulence is modulated by oxygen abundance, through the regulation of the T3SS function (Marteyn et al. 2010, Nature). We also identified a novel cell-division protein, named ZapE, which is essential for *Shigella* growth under low oxygen conditions (Marteyn et al. 2014, mBio).

Altogether, we demonstrate that *Shigella* and the innate immune system adapt to low oxygen environments. We aim at deciphering respective benefits of such physiological conditions on bacteria virulence and host response efficiency.

世話人：笹川千尋（千葉大学真菌医学研究センター長・東京大学名誉教授）
芦田　浩（東京大学医科学研究所 細菌感染生物学社会連携研究部門 ）
連絡先：芦田　浩（Tel：03-5449-5253,　E-mail： hashida@ims.u-tokyo.ac.jp ）

千葉大学 真菌医学研究センター　＆　東京大学 医科学研究所　細菌感染生物学社会連携研究部門・特別推進研究「病原細菌の自然免疫克服戦略の解明とその応用」 共催