

Segmented Filamentous Bacteria - SFP

Prevalence

- Commensal organism of both mice and rats. Impacts the development of mucosal immunity in rodents.

Significance

- SFB are instrumental in physiological inflammation that maintains intestinal homeostasis. If an imbalance occurs, SFB may become dynamic in the development of disease when immunoregulation becomes impaired. SFB can cause mucosal immunity changes which may impact research. SFB is suggested to play a significant role in disease prevention by impeding colonization of pathogens such as *Escherichia coli* and *Salmonella enterica*.

Disease

- Gram positive, spore-forming commensals. Obligate anaerobes
- Size in diameter- 0.7-1.8µm; length- 80µm
- Primarily resides in the small intestine- ileum. Attaches itself end-on to Enteric cells

Transmission

- Colonization of SFB in the ileal mucosa of mice and rats occur shortly before weaning. Transference of SFB is likely to occur via maternal immunity during the suckling period. High numbers occur shortly after weaning due to the development of the pups own mucosal immunity. A nipple-like appendage known as the holdfast inserts itself into the plasma membrane of the enterocyte without damaging or penetrating the cell.

Isolation and Diagnosis

- PCR on faeces.
- Histopathology of ileum.
- Non-invasive screening of fresh faeces; Gram stain; low sensitivity

Strains

- Potentially all animals.

Screening

- PCR and Histological examination of the ileum.

Duration

- The life cycle of Segmented Filamentous bacteria is thought to be around 2-3 days due to the rapid shedding of the intestinal epithelium of rodents.

Durability

- These organisms are most prevalent after weaning and reduce in number with age.

Prevention and Control

- SFB are not considered a primary pathogen. Either additional signals prompted by the host microbiota or other pathogens or an enteric immunity phenotype are needed to activate deleterious intestinal inflammation.

Reading

- Segmented Filamentous Bacteria: Commensal Microbes with Potential Effects on Research. *Comparative Medicine* 2014 64(2):90-98.
- Histopathology and Ultrastructure of Segmented Filamentous Bacteria-Associated Rainbow Trout Gastroenteritis: *Veterinary Pathology* 2010 47(2):220-230.
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- Segmented Filamentous Bacteria: Commensal Microbes with Potential Effects on Research. Ericsson A.C. et al. 2014, *CompMed* 64, 2:90–98
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- Segmented filamentous bacteria take the stage. Ivanov I.I. et al *Mucosal Immunol.* 2010; 3(3): 209–212. doi:10.1038/mi.2010.3.
- Apathogenic, Intestinal, Segmented, Filamentous Bacteria Stimulate the Mucosal Immune System of Mice. Klaasen, H.L.B.M. 1993, *Infection and Immunity*, 61, 1:303-306
- Colonization and induction of Th17 cells by segmented filamentous bacteria in the murine intestine. Farkas, A.M. 2015, *J Immunol Methods*; 421: 104–111. doi:10.1016/j.jim.2015.03.020.