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The microbiome, microbial-generated amyloids and Alzheimer's disease (AD)

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Abstract

Atypical amyloid generation, folding, aggregation and impaired clearance are characteristic pathological features of human neurodegenerative disorders including Alzheimer's disease (AD). What is generally not appreciated is that a major secretory product of human microbiome-resident bacteria is amyloid, and that the contribution of microbial amyloid to the pathophysiology of the human central nervous system (CNS) is potentially very substantial. While earlier findings suggested that these amyloids may serve some immune-evasive strategy, it has recently become evident that humans have a tremendously heavy systemic burden of amyloid which may contribute to the pathology of progressive neurological diseases with an amyloidogenic component. What is also particularly interesting is that dietary fiber appears to regulate the abundance and type of amyloid generated by the gastrointestinal (GI) tract microbiome. In addition, bacterial microRNA (miRNA) signaling may impact altered amyloid neurobiology in neurological disorders with an amyloidogenic component. This presentation will highlight some recent inroads made into our understanding of the enigmatic role that dietary fiber, microRNAs and microbial amyloids may play in the homeostasis and etiopathology of progressive, age-related CNS disorders with particular reference to AD, prion disease (PrD) and age-related macular degeneration (AMD) wherever possible.

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