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Authors: Maitrayee Chatterjee, Anju Choorakottayil Pushkaran, Anil Kumar Vasudevan, Krishna Kumar N. Menon, Raja Biswas, Chethampadi Gopi Mohan



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Understanding the adhesion mechanism of a mucin binding domain from *Lactobacillus fermentum* and its role in enteropathogen exclusion

Maitrayee Chatterjee¹, Anju Choorakottayil Pushkaran¹, Anil Kumar Vasudevan²,

Krishna Kumar N. Menon¹, Raja Biswas*¹ rajabiswas@aims.amrita.edu, Chethampadi

Gopi Mohan*¹ cgmohan@aims.amrita.edu

Running title: Mucin binding domain of *Lactobacillus fermentum*

¹ Centre for Nanosciences and Molecular Medicine, Amrita University, Cochin 682041, Kerala, India.

² Department of Microbiology, Amrita Institute of Medical Sciences and Research Centre, Amrita University, Cochin 682041, Kerala, India.

*To whom correspondence should be addressed: Raja Biswas or Chethampadi Gopi Mohan

Abstract:

Lactobacillus species possesses surface exposed Mucin Binding Protein (MucBP) which plays a role in adhesion to gastrointestinal mucin. MucBP contains one or more mucin binding domain (MBD), the functionality of which has yet not been characterized thoroughly. Here, we have characterized a 93-amino acid MBD (MBD₉₃) of MucBP (LAF_0673) from *Lactobacillus fermentum*. Multiple sequence alignment of *L. fermentum* MBD₉₃ exhibited ~60% sequence homology with MBDs from other *Lactobacillus* species. Further, we cloned, expressed and purified MBD₉₃ from *Escherichia coli* as N-terminal histidine-tagged protein (6X His-MBD₉₃). The purified MBD₉₃ was able to bind to mucin and showed strong affinity towards the terminally expressed mucin glycans viz. N-acetylgalactosamine (GalNAc), N-acetylglucosamine (GlcNAc), Galactose (Gal), and Sialic acid (N-acetylneuraminic acid;

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