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【925】Improving oral vaccine efficacy through the study of antibody–bacterial glycan interactions and gut dynamics

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Interactions between mucosal secretory IgA (sIgA) and bacterial surface glycan (O-antigen) protect against Salmonella Typhimurium (S. Tm) infection. sIgA binding induces “enchained growth,” reducing the number of single bacteria and enhancing enchained pathogen clearance in fecal stream. Half-life of long bacterial chains depends on detailed force-dependent kinetics of sIgA–O-antigen interactions, mechanical gut stress, and bacterial division rate. Using AFM and SPR, we quantified sIgA–O-antigen interactions parameters which were then integrated into a model that simulated bacterial chain stability against gut stress. By relating sIgA variants’ binding characteristics to bacterial chain stability, we aim to optimize oral vaccine effectiveness against bacterial surface glycans.

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