

## B lymphocytes promote *P. gingivalis*-mediated periodontal disease and inflammation in obesity

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Chronic inflammatory periodontal diseases (PD) are among the most common unresolved infections. Type 2 diabetes (T2D) is a similarly prevalent disease that represents a major risk factor for PD. Patients who develop T2D and PD suffer significant morbidity from the seemingly cyclical nature of one disease confounding the other. Mechanisms underlying the relationship between PD and T2D remain poorly defined, but one unifying link between T2D and PD is altered B lymphocyte function. Our new analyses using the standard *P. gingivalis* oral gavage model to induce PD in lean mice demonstrates B lymphocytes play minor roles in PD bone loss in this context. To the contrary, comparison of the obese/insulin resistant WT and B cell-null mouse responses to *P. gingivalis* gavage demonstrates B lymphocytes promote PD bone loss in obesity. Our data furthermore show that obesity-associated changes in B lymphocytes promote increased responses to oral pathogen ligands, as evidenced by elevated B cell production of TNF- $\alpha$  and MIP-2 when the cells are *in vivo* primed by a combination of obesity plus *P. gingivalis*, then *in vitro* challenged with *P. gingivalis* LPS or other toll-like receptor ligands. These data recapitulate our demonstration that B lymphocytes from PD patients hyper-produce TNF- $\alpha$  and the human MIP-2 ortholog (IL-8), thus suggest relevance of the mouse model to human PD. We conclude B lymphocytes promote obesity-associated PD and oral pathogen-associated systemic inflammation. Our data therefore raise the radical possibility that FDA-approved B cell depletion drugs may effectively break the feed-forward inflammatory loop between T2D and PD.

### Biography

Barbara Nikolajczyk completed her Ph.D. at the University of North Carolina at Chapel Hill, and post-doctoral work at Tufts University and Brandeis University. She is currently an Associate Professor at Boston University School of Medicine in the Departments of Microbiology and Medicine. She has published more than 30 papers in reputed journals and has spoken widely on the role lymphocytes play in type 2 diabetes with a particular interest in patient-based analyses.

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