

Association of dietary nutrients with inflammation and oxidative stress in periodontal disease

With the support from the National Natural Science Foundation of China and the Ministry of Science and Technology of China, Prof. Yin Huiyong's laboratory at the Institute for Nutritional Sciences, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, reported the alterations in salivary redox status and fatty acid metabolism in response to inflammation and oxidative stress in periodontal disease identified by mass spectrometry-based metabolomic profiling, which was published in *Free Radical Biology and Medicine* (2014, 70: 223–232, <http://www.sciencedirect.com/science/article/pii/S0891584914001014>).

Periodontal diseases represent the most common chronic inflammatory diseases in humans and a major cause of tooth loss. Periodontitis is a complex multifactorial disease and accumulating evidence indicates that chronic inflammation, redox imbalance, and oxidative stress contribute to the disease onset and progression. However, the exact mechanism that leads to local and systemic redox alteration in periodontal diseases remains poorly defined.

Prof. Yin and his team studied a cohort of nonsmoker subjects with chronic periodontitis using mass spectrometry-based ionomics and a targeted lipidomics on fatty acids metabolites. They observed that the levels of redox active metal ions including Mn, Cu, Zn in the periodontal group were decreased, consistent with a decreased level of superoxide dismutases (SODs) in saliva and serum. They also found that the major metabolites of arachidonic acid and linoleic acid in saliva, including PGE₂, PGD₂, and PGF₂, TXB₂, 5-HETE, were increased in the periodontal group, and the levels of salivary F₂-isoprostanes, free radical lipid peroxidation products and a gold standard for oxidative stress *in vivo*, were also increased. These observations highlight the importance of redox status in periodontitis and provide rationale to prevent periodontal disease by dietary interventions aiming to restore redox balance. This work was collaborated with Dr. Zhang Meifang from the Department of Clinical Nutrition at Shanghai No. 9 People's Hospital.

