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The recent development of therapeutic peptide candidates for bone disease

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Peptides are attractive for developing novel therapeutic reagents, since they are flexible in adopting and mimicking the local structural features of proteins. The capability of organic synthesis is another unique feature of peptides compared to protein-based medicines, such as antibodies. On the other hand, a disadvantage of using a peptide for a therapeutic purpose is its low stability and/or aggregation. We have developed several therapeutic peptide candidates for bone disease such as osteoporosis, rheumatoid arthritis, and periodontal disease. W9-peptide, one of the therapeutic peptide candidates on bone destruction, showed the inhibitory effects of bone resorption and stimulatory effects of bone formation. A W9-peptide, the tumor necrosis factor (TNF)-α antagonist, was originally designed to mimic the structural feature of the binding site of TNF-α on TNF type 1 receptor, and it was also proven to antagonize the actions of receptor activator of NF-κ B ligand (RANKL), thereby inhibiting osteoclastogenesis as well as reducing inflammation. The stimulatory mechanism of W9-peptide on bone formation is now under investigation. In this talk, I will introduce several therapeutic-peptide-candidates for bone disease including the W9-peptide, and also show the possible methods for overcoming the obstacles associated with using the therapeutic-peptide-candidates toward the clinical use.

Biography

Kazuhiro Aoki graduated from the Faculty of Dentistry of Tokyo Medical and Dental University at 1992 and has completed his Ph.D. at the age of 30 years from the same National University and postdoctoral studies from Yale University School of Medicine. He is the Associate Professor of Department of Bio-matrix of graduate school, Tokyo Medical and Dental University. He has published more than 70 papers in reputed journals and has been serving as a councilor of Japanese Association of Oral Biology, Japanese Society for Bone and Mineral Research, Japanese Society of Bone Morphometry and Japanese Pharmacological Society.

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