Nuclear Receptors as Targets for Drug Development: Preface

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Nuclear receptors that are ligand-dependent transcription factors play various important roles on physiological functions in living things. It has now been about 20 years since the first nuclear receptors, glucocorticoid and estrogen receptors, were cloned. During these two decades, there have been many significant discoveries and advances such as cloning of other nuclear receptors, identification of endogenous ligands for orphan receptors, and profiling of target genes. Thus, the recent advances in studies of nuclear receptors are remarkable, and thus nuclear receptors should be considered to be important targets for drug development strategies.

The reviews presented introduce recent advances in studies on the physiological roles of nuclear receptors and discuss their applications for drug development. The first article presented by Tsuchida and colleagues clearly demonstrates roles of peroxisome proliferator-activated receptor (PPAR) γ, CBEB-binding protein (CBP), and adiponectin in obesity and diabetes using knockout mouse models. Their interesting article suggests that PPARγ and CBP antagonists and adiponectin receptor agonists may be applicable for the treatment of obesity and diabetes. In the second article, Katayama and colleagues clearly show the critical role of cytokines on the decision of mesenchymal stem cell differentiation towards osteoblasts rather than adipocytes by suppressing PPARγ function. Finally, Maeyama and colleagues, based on their pharmacological analysis, demonstrate the role of nuclear receptors in the differentiation and function of mast cells. Since mast cells play an important role in inflammation and allergic diseases, their observations are important considerations when developing a therapeutic strategy.

This forum minireview is based on the symposium on “Nuclear Receptors on Diseases: Nuclear Receptors as Targets for Drug Development” at the 77th Annual Meeting of The Japanese Pharmacological Society held on March 8, 2004, Osaka. The authors would be happy if this forum minireview helps to increase understanding of the roles of nuclear receptors both in physiological process and diseases.