PPAR Research

Hindawi

Special Issue on

Cross Talk between PPARs and Signaling Molecules in Cardiovascular Biology

CALL FOR PAPERS

The peroxisome proliferator-activated receptors (PPARs) constitute a subfamily of nuclear receptors comprised of three isoforms: PPARα (NR1C1), PPARβ/δ (NR1C2), and PPARγ (NR1C3). Upon specific ligand binding, PPARs heterodimerize with the retinoid X receptor (RXR) to induce the transcriptional activation of target genes that regulate metabolic homeostasis in a tissue/cell-specific manner.

PPARs are expressed differentially in most types of cells within the cardiovascular system. Based on the abundance of research using synthetic ligands and genetic models, PPARs have been considered as central regulators controlling multiple branches of cardiovascular biology, including vascular restriction, angiogenesis, cardiac remodeling, and atherosclerosis. These biological processes are mediated by various signaling molecules such as metabolites, hormones, cytokines, and microRNAs. To serve their function in the cardiovascular system, PPARs interplay with signaling molecules in two major patterns: (1) by acting as cellular sensors that respond to ligands (e.g., fatty acids) directly or a host of critical signaling molecules (e.g., growth factors) indirectly via different intracellular signal pathways (e.g., Wnt/β-catenin, mTOR, and MAPK) and (2) by functioning as transcription factors that can regulate the expression of target genes which may regulate the intercellular signaling cascades (e.g., TGF-β signaling) and signaling molecules in cell-to-cell communication in an autocrine and/or paracrine fashion (e.g., the release of proinflammatory cytokines from monocytes and endothelin from endothelial cells). Moreover, along with their direct role in cardiovascular biology, PPARs can regulate the function and excretion of signaling molecules in distal tissue sites (e.g., FGF21 secreted from liver, adiponectin secreted from adipose tissue), which may affect the cardiovascular system via an endocrine mechanism. Understanding the complex cross talk between PPARs and related signaling molecules will promote the development of novel treatment strategies for cardiovascular disease, which is the leading cause of mortality throughout the developed world.

Here, we invite investigators to contribute high quality original research articles as well as review articles that will expand our knowledge regarding the cross talk between PPARs and other signaling molecules in the context of cardiovascular biology. Since cardiovascular function and disease are often grouped within the milieu of metabolic disorders, research focusing on obesity and type II diabetes is also encouraged. Particularly, considering the complexity of PPARs and their extensive regulatory network, research using high throughput technologies and bioinformatics is urgently needed.

Potential topics include but are not limited to the following:

- PPARs-regulated signaling molecules in cardiovascular systems (e.g., vascular smooth muscle cells, endothelial cells, cardiomyocytes, and monocytes/macrophages)
- PPARs-involved signaling pathway in the development of cardiovascular systems and pathophysiology of cardiovascular diseases (e.g., angiogenesis, fibrosis, atherosclerosis, inflammation, oxidative stress, hypercoagulability, and cardiomyopathy)
- Effects of signaling molecules on cardiovascular biology mediated by PPARs; the mechanism includes the regulation of the expression or stability of PPARs, recruitment of coactivators, and levels of ligands by hormones, cytokines, metabolites, microRNAs, or other signaling pathways
- PPARs-involved signaling pathway in other systems (e.g., liver, adipose tissue, skeletal muscle, and CNS) that affect cardiovascular biology
- PPARs-related studies in obesity and type II diabetes, which have secondary implications in cardiovascular biology
- Lipidomics, proteomics, metabonomics, transcriptomics, genomics, and bioinformatics based studies that help understand the cross talk between PPARs and relative signaling molecules in cardiovascular biology
- New PPAR ligands as potential drug targets to fight cardiovascular disease

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ppar/cpsmc/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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