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The IL-1 family of ligands and receptors has a central role in both innate and adaptive immune responses and is tightly controlled by antagonists, decoy receptors, scavengers, dominant negative molecules, miRNAs and other mechanisms, acting extracellularly or intracellularly. During evolution, the development of multiple mechanisms of negative regulation reveals the need for tight control of the biological consequences of IL-1 family ligands in order to balance local and systemic inflammation and limit immunopathology. Indeed, studies with gene targeted mice for negative regulators and genetic studies in humans provide evidence for their non-redundant role in controlling inflammation, tissue damage and adaptive responses. In addition, studies have revealed the need of negative regulation of the IL-1 family not only in disease, but also in homeostatic conditions. In this review, the negative regulation mediated by decoy receptors are presented and include IL-1R2 and IL-IL-18BP as well as atypical receptors, which include TIR8/SIGIRR, IL-1RAcPb, TIGIRR-1 and IL-1RAPL. Particular emphasis is given to IL-1R2, since its discovery is the basis for the formulation of the decoy paradigm, now considered a general strategy to counter the primary inflammatory activities of cytokines and chemokines. Emphasis is also given to TIR8, a prototypical negative regulatory receptor having non-redundant roles in limiting inflammation and adaptive responses.