Abstract
Chronic venous insufficiency (CVI) is accompanied by a marked inflammatory response that is thought to contribute to the development and progression of the disorder. While compression therapy has long been considered the standard treatment for CVI, recent studies suggest that treatment with flavonoids may also be beneficial. The purpose of this review is to summarize how plant flavonoids attenuate inflammation and the immune response through their inhibition of important regulatory enzymes. Certain flavonoids are potent inhibitors of the production of prostaglandins, a group of powerful proinflammatory signaling molecules. Studies have shown that this effect is due to flavonoid inhibition of key enzymes involved in prostaglandin biosynthesis (i.e., lipoxygenase, phospholipase, and cyclooxygenase). Flavonoids also inhibit phosphodiesterases involved in cell activation. Much of this effect is upon the biosynthesis of protein cytokines that mediate adhesion of circulating leukocytes to sites of injury. The protein kinases are another class of regulatory enzymes affected by flavonoids. The inhibition of kinases is due to the competitive binding of flavonoids with ATP at catalytic sites on the enzymes. These modes of inhibition provide the mechanisms by which flavonoids inhibit the inflammation response and suggest that this class of molecules may be effective in the treatment of CVI.