

Abstract

Indoleamine 2,3-dioxygenase (IDO) is an enzyme that is physiologically expressed in many tissues including small intestine, lung, female genital tract and placenta. It is a key enzyme in metabolism of tryptophan and catalyses the first rate-limiting step in the conversion of tryptophan to kynurenine. IDO plays an important role in immune system in fighting against various pathogens. Its expression is actively induced by inflammatory mediators and it has also an immunosuppressive function. Inducible counter-regulation of inflammation is very important for controlling its potential harmful effects. Depletion of tryptophan and production of kynurenines causes local suppression of effector T lymphocytes and activation of regulatory T cells. It can also support differentiation of dendritic cells toward an immunosuppressive phenotype. IDO expression has been observed in several cancer cell types including acute myeloid leukaemia, ovarian cancer or colorectal carcinoma and plays a major role in suppression of anti-tumour immunity. Thus, the inhibition of IDO may improve the efficacy of chemotherapy and immunotherapeutical protocols. Some IDO inhibitors are currently being tested in clinical trials and preliminary results seem promising so that it may become a new anticancer strategy.

Key words

indoleamine 2,3-dioxygenase (IDO), cancer, suppression of immune response, malignant transformation, IDO inhibition, cancer therapy