

## Abstract

Interferon  $\gamma$  is an important T-cell helper type 1 (Th1) cytokine involved in antimicrobial immunity. It is a part of the inflammatory immune response in the site of infection. However, for its proper function, the regulation of immunity is necessary to avoid injury of the tissue caused by long-term inflammation. While interferon  $\gamma$  triggers expression of proinflammatory genes, it also regulates genes which inactivate immune response. The B7-H1 molecule belongs among these inhibitory regulators.

Furthermore, antitumour effect of interferon  $\gamma$  is well-known as well. After extensive experiments, interferon  $\gamma$  was tested as an immunotherapeutic drug against melanomas in clinical trials. However, the trials had to be terminated prematurely because of unsuccessful results. It started to be clear that interferon  $\gamma$  could have also a protumour effect. Interferon  $\gamma$  upregulates the expression of B7-H1 molecule which aids tumour in escape from immunity. The B7-H1 molecule possesses a binding site for interferon regulatory factor 1 (IRF-1) in its promoter region. This IRF-1 is induced by interferon  $\gamma$  – JAK/STAT signalling pathway.

In our previous research, we observed interferon  $\gamma$  induced DNA demethylation of promoters in genes that are involved in antigen presenting machinery. Additionally, DNA methylation of interferon regulatory factors was observed in different tumours. Owing to these facts, I wanted to clarify the possible role of DNA methylation of B7-H1 molecule via IRF-1 transcription factor after interferon  $\gamma$  treatment.

The elucidation of the B7-H1 regulation might contribute to better design of anticancer immunotherapy based on interferon  $\gamma$ .