Combination of immunotherapy and histone deacetylase inhibitors in cancer treatment

BIOOPEN 2021 – POST-CONFERENCE COMMUNICATION

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Nowadays, there are many methods for treating cancer. Most of them have serious drawbacks such as a lack of effective treatment for patients with metastasis, and severe side effects. The greatest hope in cancer treatment lies in the combination of different types of therapy. One such strategy is the combination of immunotherapy and histone deacetylase inhibitors (iHDACs).

Histone acetyltransferases (HATs) and histone deacetylases (HDACs) are the key enzymes that participate in the modelling of chromatin structure by attachment or detachment of acetyl groups. This process regulates gene expression. Disorders of this process can lead to cancerogenesis. Overexpression of HDACs is frequently observed in cancer cells, causing alternation of tumour suppressor gene expression. Therefore, iHDACs are a promising therapeutic tool. Furthermore, it has been proven that the use of iHDACs might lead to an increase in the efficiency of immunotherapy, a treatment strategy that uses a person's own immune system to fight cancer. iHDACs have a positive effect on immune response by increasing the immunogenicity of the tumour, which facilitates the recruitment of immune system elements. Furthermore, iHDACs increase the vulnerability of cancer cells to the effects of the immune system and reduce the immunosuppressive impact of the tumour microenvironment.

The combination of immunotherapy and iHDACs is a highly promising method of cancer treatment. Nowadays, there are many preclinical and clinical trials that focus on searching for the most beneficial combination of iHDACs with immunomodulatory factors to achieve a proper synergistic effect.