ANTICANCER BIOLOGICAL ACTIVITY OF SOME PYRROLE-SUBSTITUTED IMIDAZO[1,2-a]PYRIDINE AND PYRIDO[1,2-a]PYRIMIDINE DERIVATIVES

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Pyrido[1,2-a]pyrimidine derivatives exhibit a wide range of biological activities, including antibacterial, antitumor, anti-inflammatory, and antiviral properties. These compounds are used in the development of pharmaceutical drugs for the treatment of various diseases such as infections and tumors. Additionally, they are applied in agriculture as components for combating infectious diseases in plants and animals [1].

The imidazo[1,2-a]pyridine scaffold is a key structure in many pharmaceutical compounds. Derivatives of this heterocycle demonstrate a broad spectrum of biological activities, including antibacterial, antifungal, anti-inflammatory, and antitumor effects. They are used in the synthesis of various drugs aimed at treating infections, inflammatory diseases, and cancer. Furthermore, these compounds are utilized in agriculture for plant protection against pathogens [2].

As mentioned above, imidazo[1,2-a]pyridine and pyrido[1,2-a]pyrimidine derivatives are widely used in medicine as pharmaceutical agents. Based on this information, we investigated the biological activity of the synthesized compounds, including 5-amino-7-(1H-pyrrol-2-yl)-2,3-dihydroimidazo[1,2-a]pyridine-6,8-dicarbonitrile, 6-amino-8-(1-methyl-1H-pyrrol-2-yl)-3,4-dihydro-2H-pyrido[1,2-a]pyrimidine-7,9-dicarbonitrile, and 3-acetyl-6-amino-5-cyano-1-phenyl-4-(1H-pyrrol-2-yl)pyridinium-2-olate. Their potential anticancer activities were evaluated against several cancer cell lines.

For this purpose, breast adenocarcinoma cell lines (MDA-MB-231 and MCF7), rat glioma (C6), human colorectal cancer (HT29), and healthy fibroblast cells (L929) were obtained from the American Type Culture Collection (ATCC) and used in the study. The cells were cultured in 89 % Dulbecco's Modified Eagle Medium (DMEM), supplemented with 10 % fetal bovine serum (FBS) and 1 % penicillin solution. They were incubated at 37 °C in a humidified atmosphere containing 95 % humidity and 5 % CO_2.

The cytotoxic effects of all synthesized compounds on L929, MDA-MB-231, MCF7, HT29, and C6 cells were determined using the MTT assay (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl-tetrazolium bromide test). Subsequently, the percentages of dead, viable, early, and late apoptotic cells were analyzed using the Muse Cell Analyzer (Millipore).

The anticancer activity of the synthesized compounds was evaluated through MTT assays against five different cell lines: MCF7, MDA-MB-231, C6, HT29, and L929. Cisplatin, a well-known chemotherapeutic drug, was used as a negative control. The results confirmed that the tested compounds exhibited significant biological activity against cancer cells.

1. Anil Kumar Verma, Abha Bishnoi, Shaheen Fatma, Huda Parveen and Vineeta Singh, *Chemistry Select* 2017, 2(2017), 4006-4009

2. Aakash Deep, Richa Kaur Bhatia, Ramanjot Kaur, and [et. al.], *Current Topics in Medicinal Chemistry*, 2017,17(2), 238-250