Pentamidine is a medication that is used to treat a variety of conditions caused by protozoan parasites. It is primarily used to treat leishmaniasis, a parasitic infection that is transmitted through the bite of an infected sandfly. It is also used to treat Pneumocystis jiroveci pneumonia (PCP), a type of lung infection that can occur in people with weakened immune systems.

Pentamidine works by interfering with the DNA and RNA of the parasites, which ultimately leads to their death. It is usually administered either by injection or by inhalation, depending on the condition being treated.

Like all medications, pentamidine can cause side effects. Some of the most common side effects include nausea, vomiting, diarrhea, abdominal pain, fever, and chills. In rare cases, it can cause more serious side effects such as kidney damage, low blood pressure, and irregular heart rhythm.

It is important to follow the instructions of your healthcare provider when taking pentamidine and to report any side effects you experience.

Among the 1301 agents, pentamidine-an antibiotic for Pneumocystis jirovecii-emerged as a successful antiglioma agent. Pentamidine treatment suppressed proliferation and stemness in glioma-initiating cell lines. Proliferation and migration were inhibited in all differentiated glioma-initiating cells and glioblastoma cell lines, with cell cycle arrest and caspase-dependent apoptosis induction. The in vivo study reproduced the same findings as the in vitro studies. Pentamidine showed a stronger antiproliferative effect on glioma-initiating cells than on differentiated cells. Western blot analysis revealed pentamidine inhibited phosphorylation of signal transducer and activator of transcription 3 in all cell lines, whereas Akt expression was suppressed in glioma-initiating cells but not in differentiated lines. In the present study, we identified pentamidine as a potential therapeutic drug for glioma. Pentamidine could be promising for the treatment of glioblastomas by targeting both glioma-initiating cells and differentiated cells through its multifaceted antiglioma effects [1)]

DNA-binding proteins are proteins composed of DNA-binding domains and thus have a specific or general affinity for either single or double stranded DNA.

Sequence-specific DNA-binding proteins generally interact with the major groove of B-DNA, because it exposes more functional groups that identify a base pair. However, there are some known minor groove DNA-binding ligands such as netropsin,[distamycin, Hoechst 33258, pentamidine, DAPI and others.

1)
Tamai S, Ichinose T, Jiapaer S, Hirai N, Sabit H, Tanaka S, Kinoshita M, Kobayashi M, Hirao A, Nakada M. Therapeutic potential of pentamidine for glioma-initiating cells and glioma cells through multimodal antitumor effects. Cancer Sci. 2023 May 4. doi: 10.1111/cas.15827. Epub ahead of print. PMID: 37142416.