Abstract

The effects of targeted therapies in the treatment of cancer have been extensively researched and tested in many clinical trials. In contrast to conventional chemotherapy treatment, targeted therapy should act specifically on cancer cells with limited toxicity and lower risk of side effects. One type of targeted therapy exploits the Achilles heel of cancer - the specificity of tumour metabolism. With knowledge of the metabolic differences between tumor and normal cells, we can set up conditions that normal cells easily bridge, while tumor cells die as a result. This can be achieved by removing certain amino acids from the extracellular environment on which cancer cells depend. A well-known enzyme that has been used therapeutically for many years is asparaginase. However, asparaginase therapy is only successful in some cancers, so further development is needed, as well as the search for enzymes with similar effects. Over the years, four other enzymes that could become an integral part of the treatment of cancer patients in the future have been discovered – arginine deiminase, arginase, methioninase and cyst(e)inase. Past and current studies have investigated their effects on cancer cells *in vitro* and *in vivo*. Successful elimination of cancer cells often comes with limitations as immunogenicity and resistance. With each new study come new answers, but also more challenges we need to deal with if these enzymes would help to fight off one of the most feared diseases of the last few decades.