

ABSTRACT

Leukemia is a heterogeneous group of hematological malignancies that result from the abnormal proliferation of immature blood cells. One of the hallmarks of tumor cells is their altered metabolism. Therefore, therapy targeting deregulated metabolic processes is an attractive strategy for the treatment of malignancies, including hematological ones. Amino acid metabolism is an important part of cellular metabolism, and targeting it appears to be a key attractive strategy in the treatment of leukemia. Glutamine, a conditionally essential amino acid, plays a crucial role in energy metabolism and maintaining the redox balance of leukemia cells, thereby contributing to their growth and proliferation. Strategies to treat leukemia by targeting glutamine metabolism include glutamine depletion, the use of glutamine transporter inhibitors and glutaminase enzyme inhibitors. To ensure the effectiveness of leukemia treatment, it is essential to recognize that glutamine is involved in numerous metabolic pathways, each of which is regulated by multiple factors. As a result, therapies targeting glutamine metabolism should be carefully designed to avoid affecting healthy cells and patient immunity. This thesis describes leukemia, including its types and treatments, and glutamine metabolism and its potential targeting in leukemia treatment. Attention is also given to the enzyme L-asparaginase, which is used in the treatment of acute lymphoblastic leukemia and has both glutaminase and asparaginase activity.

Key words: leukemia, glutamine, L-asparaginase, therapy, metabolism