

1 **Abstract:**

2 T-cell acute leukemia and lymphoma have a poor prognosis. Although new therapeutic
3 agents have been developed, their therapeutic effects are suboptimal. α -Pinene, a
4 monoterpene compound, has an antitumor effect on solid tumors; however, few
5 comprehensive investigations have been conducted on its impact on hematologic
6 malignancies. This report provides a comprehensive analysis of the potential benefits of using
7 α -pinene as an antitumor agent for the treatment of T-cell tumors. We found that α -pinene
8 inhibited the proliferation of hematological malignancies, especially in T-cell tumor cell lines
9 EL-4 and Molt-4, induced mitochondrial dysfunction and reactive oxygen species
10 accumulation, and inhibited NF- κ B p65 translocation into the nucleus, leading to robust
11 apoptosis in EL-4 cells. Collectively, these findings suggest that α -pinene has potential as a
12 therapeutic agent for T-cell malignancies, and further investigation is warranted.