

# PD-L1/PD-1 Check Point in Anaplastic Large Cell Lymphoma, ALK<sup>+</sup>: A Case Report with Immunohistochemical and Molecular Study

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## Abstract

Anaplastic large cell lymphoma, ALK<sup>+</sup> (ALK<sup>+</sup> ALCL) is a T-cell lymphoma consisting of large and pleomorphic lymphoid cells, often with horseshoe-shaped nuclei, with a chromosomal translocation involving the *CESS* gene and

normal immune response against microorganisms, to protect the involved tissues from excessive damage incurred during such a response and to prevent its potential autoimmune complications. PD-L1 has been

from ALK<sup>+</sup> ALCL tumors, with frequencies of PD-L1<sup>+</sup> cases varying from 34 to 100% of the analyzed cases [13-15].

What is particularly interesting, Marzec et al. showed that activation of the transcription factor STAT3 by the NPM-ALK fusion protein could be responsible for the increased expression of PD-L1 at the cell surface of ALK<sup>+</sup> tumor cells. Moreover, the same group showed that NPM-ALK induces the activation of the IL-10 and TGF- $\beta$  cytokines. Since IL-10 can also activate JAK/STAT signaling *via* STAT3, and thus