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QUESTION

Neoplastic cells typically evade immunosurveillance. Explain how this occurs and describe how targeting tumour-mediated immune suppression has led to novel cancer immunotherapeutics

ANSWER

By impairing CTL activity through the release of a number of immune-suppressive cytokines, tumours can avoid immune surveillance. Both cancer cells and non-cancerous cells, particularly immunological and epithelial cells, that are part of the tumour microenvironment can cause it.

The activation of the enzyme indoleamine 2,3-dioxygenase is one of the many elements that encourage immune escape and tumour development in cancer cells (IDO). IDO is an enzyme that turns tryptophan (Trp) into kynurenine (Kyn) and is implicated in the development of tumours and the inhibition of the immune system.
It is preferable to think of the immune response to cancer cells as a particular type of immunity where the malignant cell has evolved and learned how to survive.
Burnet and Thomas, who independently developed the immunological surveillance theory, proposed that the immune system continuously scanned the body for the existence of cancerous cells, which can perpetually develop as a result of mutations.

Based on the knowledge that cancer cells do, in fact, express tumor-associated antigens (TAAs) or tumor-specific antigens (TSAs), which the immune system can identify as foreign substances, immune surveillance has the potential to be effective.
The ability of tumour cells to avoid immune recognition can be used to explain the onset of cancer. This ability can be attributed to the immune system's inability

to function properly, the induction of immune tolerance, or other inhibitory mechanisms that enable the tumour to avoid immune detection and elimination.