TRANSPOSABLE ELEMENTS IN CANCER

In healthy cells, transposable elements (TEs) are typically inactivated by methylation. But in cancer cells, these elements can become demethylated, enabling them to be expressed (1). Some transposable elements code for proteins such as endonuclease and reverse transcriptase (2). The activity of these proteins enables transposable elements to reinsert themselves into DNA, causing damage and mutations (3). TEs that are unable to reverse transcribe may still be translated into antigens, which can subsequently be expressed on the cell surface (4). The expression of transposable elements can also activate the cell’s innate immune response in various ways, such as through DNA damage or via the presence of TE-derived RNA in the cytoplasm (5), an effect that may subsequently alter a cancer’s ability to spread.