Oncogene Encyclopedia Article

Oncogene

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Contents

Oncogene Encyclopedia Article.....1

Contents.....2

Oncogene.....3

Oncogene

Oncogenes are a special type of **gene** that is capable of transforming host cells and triggering carcinogenesis. The name is derived from the Greek *onkos*, meaning bulk, or mass, because of the ability to cause **tumor** growth. Oncogenes were first discovered in retroviruses (viruses containing the enzyme **reverse transcriptase**, and **RNA**, rather than **DNA**) that were found to cause **cancer** in many animals (for example: feline leukemia **virus**, simian sarcoma virus). Although this is a relatively common mechanism of oncogenesis in animals, very few oncogene carrying viruses have been identified in man. The ones that are known include the papilloma virus HPV16 that is associated with cervical cancer, HTLV-1 and HTLV-2 associated with T-cell leukemia, and HIV-1 associated with Kaposi sarcoma.

Rather than viral infection, studies of humans led to the discovery of related genes called proto-oncogenes that exist naturally in the human **genome**. hese genes have DNA sequences that are similar to oncogenes, but under normal conditions, the proto-oncogenes do not cause cancer. However, specific mutations in these genes can transform them to an oncogenic form that may lead to carcinogenesis. So, in humans, there are two unique ways in which oncogenesis occurs, by true viral infection and by **mutation** of proto-oncogenes that already exist in human cells.