Extended Abstract Insights in Immunology 2019
Vol.2 No.1

Rekombinant parvoviruses in gene therapy of Cancer

Salka M bareck

laboratoir national, Mauritania

Abstract

The Cancer is the second most common cause of death after cardiovascular disease The therapy is currently predominantly with traditional methods, which include the surgical removal of tumors,Chemotherapy and radiotherapy count. The chemo- and radiotherapy lead as well as strong cytotoxic side effects in healthy body cells significantly affects the quality of life of patients.

Gene therapy approaches to fight cancer:

In cancer gene therapy, three approaches are currently dominating:

(i) the direct Correction of genetic defects (for example mutations) in tumor cells,

(ii) the Pursuit of new strategies for drug therapy and

(iii) the Improvement of immunotherapy.

The Methods of improved drug therapy and immunotherapy usually aim at an active destruction of the tumor cells, while the Method of correction at the genetic level a causal therapy of the causes represents.

Correction of genetic defects in tumor cells: Tumor cells show by a loss of function of tumor suppressor genes (for Example p53, p21) and / or an overactivity of tumor-promoting oncogenes

(For example, ras, c-myc, bcl-2) an altered genetic material compared to normal

Body cells on. The goal of so-called causal therapy is to remedy this genetic defect. In a hyperactivity of oncogenes, theGene expression by inhibition of protein synthesis or equivalent

Transcription factors are inhibited. This method is considered very promising, but requires the most selective gene transfer in the

Tumor. The introduction of a tumor suppressor gene, for Example p53, already showed strong antitumoral effects in clinical trials.This gene is present in normal body cells anyway, the vector must be there have no absolute tumor selectivity. However, for an efficient Therapy all tumor cells are taken. This absolute tumor targeting poses still the fundamental problem of gene therapy dar.

Introduction:

The parvoviruses (parvo meaning small) are a gaggle of very small DNA viruses that are ubiquitous and infect many species of animals. The small amount of DNA contained within the viruses doesn't carry sufficient genetic information to direct its own replication in host cells. As a result, parvoviruses have unusual requirements for replication, like a simultaneous helper virus or rapidly dividing cells. They are divided into two groups on the basis of these requirements. The parvoviruses that multiply only in cells coinfected with a helper adenovirus constitute the genus dependovirus (previously called the adeno-associated viruses [AAVs]). These viruses have not been shown to cause disease in humans. The second group of parvoviruses, constituting the genus Parvovirus, do not require a helper virus for replication. However, they multiply only in cells that are within the process of replicating their own DNA. The diseases caused by autonomous parvoviruses reflect their requirement for actively dividing cells. The human autonomous parvovirus, B19 virus, replicates in erythroid precursor cells and hence produces aplastic crisis in predisposed individuals with underlying haemolytic anaemia or immunodeficiency. Other clinical manifestations of B19 virus infection are due to the host immune response to the virus.Erythema infectiosum, also known as fifth disease, is the most common clinical manifestation of B19 virus infection. Clinical symptoms develop in a biphasic fashion. Some 7 to eight days after infection, a prodromal influenza-like illness develops, characterized by headache, malaise, chills, and pyrexia. Individuals are then asymptomatic for a week. The second phase of illness occurs 17 to 18 days after infection, with the development of a mild febrile illness and a maculopapular rash. The first sign of illness is marked erythema of the cheeks (“slapped-cheeks” appearance) followed by a rash on the trunk and limbs. The rash initially features a discrete erythematous maculopapular appearance then becomes reticular, disappearing in 1 to three weeks. Erythema infectiosum often resembles the rash of rubella. A rash doesn't always occur following B19 viral infection , and therefore the only manifestation of the second phase of the illness could also be a light , influenza-like illness. Joint involvement occurs in most women and much less frequently in men and children. The most common presentation is of an acute-onset, symmetric arthritis involving the small joints of the hands, wrists, ankles, and knees. Recovery usually occurs within 2 to 4 weeks. B19 arthropathy may also occur in the absence of the rash. Transient lymphopenia, neutropenia, and thrombocytopenia are complications of B19 virus infection, but are rarely severe enough to cause problems.Human B19 virus is a nonenveloped, icosahedral virus with a diameter of 18 to 26 nm. The virus capsid is composed of two structural proteins. Structural proteins VP-l and VP-2 have molecular weights of 83,000 and 58,000, respectively, and account for 60 to 80 percent of the virion mass. The DNA genome is 5.5 kilobases long and therefore the virus packages plus and minus DNA strands into separate virions with equal efficiency. It is very hardy and viral infectivity is immune to ether, chloroform, deoxyribonuclease (DNase) and ribonuclease (RNase) treatment. Both the production method, as well as the storage of viruses can be the viral Strongly influence infectiousness. Iodixanol gradients lead to higher levels Yield of infectious virus as CsCl gradient. A longer storage decreases usually the infectiousness of a virus stick. A recombinant virus stick should therefore be best directly and targeted for a particular application getting produced. Thus, the initial higher infectivity potential of the . Exploited virus production and avoided a loss of quality

The broad field of gene therapy promises variety of innovative treatments that are likely to become important in preventing deaths from cancer. In this review, we discuss the history, highlights and way forward for three different gene therapy treatment approaches: immunotherapy, oncolytic virotherapy and gene transfer. Immunotherapy uses genetically modified cells and viral particles to stimulate the system to destroy cancer cells. Recent clinical trials of second and third generation vaccines have shown encouraging results with a wide range of cancers, including lung cancer,

pancreatic cancer, prostate cancer and malignant melanoma. Oncolytic virotherapy, which uses viral particles that replicate within the neoplastic cell to cause necrobiosis , is an emerging treatment modality that shows great promise, particularly with metastatic cancers. Initial phase I clinical trial trials for several vectors have generated excitement over the potential power of this system . Gene transfer may be a new treatment modality that introduces new genes into a cancerous cell or the encompassing tissue to cause necrobiosis or slow the expansion of the cancer. This treatment technique is extremely flexible, and a good range of genes and vectors are getting used in clinical trials with successful outcomes. As these therapies mature, they'll be used alone or together with current treatments to assist make cancer a manageable disease.