

Studies of human Interferon α , β and γ activities on different cell cultures against rubella virus

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Abstract

Human interferon (IFN) has complex effects but probably the main antiviral action is to reduce the translation of viral mRNA. IFNs induces the antiviral state of the cell when they bind to specific receptor. In our study, showed that at least two functional IFN receptors on human cells. IFN α and β bind to one type of receptor, whereas IFN γ bind to another.

Natural cell culture (HAC) which was used in the present study containing both receptors to IFN α , β and γ while MRC-5 which treated with some chemicals to be diploid cells lost the receptors IFN γ . HeLa cells on the other hand which is malignant cells lost both receptors on the other hand all types of interferon are non toxic at concentration up to 1000 unit/ml to all types of tissue culture involved in this study, while all types of interferon inhibit rubella virus growth at concentration of (2.5 unit/ml) and by use of therapeutic index (TI) which is the ratio of the dose of interferon which is just toxic to the dose which is just effective. If this index is one or less it is not possible to use in man, if this index is larger than the margin of study is great. The (TI) of interferon against rubella virus was more than 500, therefore interferon if used in such concentration (around 5 unit /ml) in human have no side effect.

Introduction

Since the discovery of interferon (IFN) it has been evident that IFN is in theory at least the ideal antiviral agent. It is naturally occurring, relatively non toxic and display a broad spectrum of activity against essentially all viruses. Clinical trials in man were generally disappointing until the purification IFN was developed in late 1970 [1]. After that time investigations about the antiviral effect of IFN have been numerous, but their results are difficult to compare because of lack of standardized dosages and titer. In addition, such research has until recently been hampered by the scarcity and expanse associated with obtaining natural IFN (1).

IFN is subdivided into three classes α , β and γ followed by the techniques of recombinant DNA to manufacture

recombinant IFN [2,3,4,5,6,7,8] and various subtypes of IFN (α and β and also γ) are now available. However virtually all the studies that compare recombinant and natural IFN revealed that they are not identical and their effect is different [9,10,11,12,13,14].

IFN is administrated to treat many viral diseases such as viral hepatitis B, C and D [15,16,17], and it is generally assumed that IFN constitutes the first line of defense against viral infection in man and other animals. Although IFNs do not act directly on intact virus, they act on the cells and inducing antiviral state.

The development of antiviral activity requires metabolic activity on the part of the cells [22]. Thus, the antiviral state induced by IFN is directed against a wide variety and maybe all viruses while antiviral antibodies which are

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