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Reverse transcriptic mutation

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Autoimmune phenomena caused by hepatitis C virus (HCV) infection-a non-retroviral infection-are well known, anti-dsDNA antibodies that are highly specific for systemic lupus erythematosus (SLE)have been observed. These antibodies are present in 70% of SLE cases, whereas they appear in only 0.5% of people without SLE. The mechanisms underlying this association have, however, not been elucidated. Retroviral infections have been little studied in humans, although they have been implicated in carcinogenesis in a number of non-human animals. The above-mentioned points are examined in terms of the following hypothesis(Reverse transcriptic mutation; RTM): RNA viruses cause chronic infections. A few mutations affecting part of the reverse transcriptase(RT) process(RdRp->RdDp[RNA-dependent DNA polymerase]) or all enzyme activity arise(RdRp->RT) in RdRp. Mutants of (RdRp->RdDp), which give rise to induce an autoimmune mechanism due to the production of a DNA antigen(1a). Next, complete RT activity is recognized, then a malignant transformation mechanism, similar to that caused by retroviruses (2), occurs. Moreover, other autoimmune mechanisms, resulting from the production of DNA antigen, occur when the variant strain exhibits only RdDp processes due to a point mutation of RT (1b).
Autoimmune type:(1a)RdRp->RdDp(SLE:R2dR2p->R2dD2p),(1b)RT->RdDp
Cancer type:(2)RdRp->RT.Support of the hypothesis: Host cells rarely have RNA polymerase activity, and RNA viruses cause an increase in the expression of two enzymes: RT and RdRp. A study that compared the amino acid sequences of these two enzymes found the sequences to be similar and not change significantly by evolution. There are only a few amino acids in the active sites of these enzymes, and the identification of NTP or dNTP are only having OH basis of the carbohydrate. RT transcribes single-stranded (ss) RNA into a double-stranded (ds) DNA provirus, and this proviral DNA is integrated into the host genome. The process depends on the activity of three enzymes: RNA-dependent DNA polymerase, RNase H, and DNA-dependent DNA polymerase.Regarding the SLE antibodies to a dsDNA antigen, most RNA viruses that infect humans are single stranded. However, the Reoviridae are double-stranded viruses, and are therefore ideal when thinking from the RTM. SLE is a global disease, and viruses in the family Reoviridae, such as reoviruses(orthoreoviruses) and rotaviruses, are also found worldwide. Furthermore, reoviruses can be cultured in human and monkey kidney cells but rotaviruses can only be cultured in monkey cells: the fetal rhesus monkey kidney cell . SLE is probably caused by an reovirus. With regard to the autoantibodies related to lupus, significant elevation in the antibody titers to a number of viruses, including measles; rubella; parainfluenza types 1, 2, and 3; reovirus type 2; mumps; and Epstein Barr (EB) virus has been reported in SLE (Cannavan et al.). EB virus is a dsDNA virus. In addition to normal causes of infectious mononucleosis in primary infection, which show no clinical symptoms and are due to a decline in immune function, there is Burkitt's lymphoma caused by reactivation of a latent virus infection and nasopharyngeal cancer Ninety percent of Japanese people have antibodies against this virus and therefore should not be susceptible to SLE. Other RNA viruses, except for reovirus type 2, are single stranded. Reovirus gives rise to a dsDNA antigen, which causes SLE. In contrast, the other viruses probably give rise to a ssDNA antigen by RTM.Furthermore, when considered from the perspective of an RNA

world hypothesis, this can be expressed as RdRp->RT and RT->RdRp. This scenario is plausible if we accept that RdDp could be changed to RdRp by mutation. It seems that a more detailed examination of the RNA world hypothesis is required.

Keywords: Reverse transcriptic mutation, RNA dependent RNA polymerase, Reverse transcriptase, SLE, RNA world, Origin and evolution of life