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ESTABLISHMENT AND CHARACTERIZATION OF A THYMIDINE-KINASE DEFICIENT CELL LINE FROM JAPANESE QUAIL CELL LINE, QT35.

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Thymiaine-kinase deficient (TK^-) cell lines of serveral mammalian cells have been established, and recombinant viruses that have foreign genes within the viral TK gene have been constructed by using the TK^- cell lines. In the present study, I established a TK^- cell line (QT-TK^- cells) from Japanese quail cell line QT35, and examined the biological characteristics of QT-TK^- cells for use in the selection of TK^- avian viruses. A TK^- mutant cell line, QT-TK^-, which was resistant to 100 μ g/ml bromodeoxyuridine (BUdR) was established by multi-step selection with BUdR. The QT-TK^- cells could not grow in HAT medium. The uptake of ^{3}H-thymidine, the TK activity in the cell extract, and the rate of cells that incorporated BUdR of QT-TK^- cells were significantly decreased to 0.3%, 0.5%, and 0.6% respectively, when compared with those of QT35 cells.

The thymidylate synthase activity, the karyotype, and the sensitivity to two avian viruses of QT-TK^- cells were similar to those of QT35 cells, indicating that the biological characteristics of these two cell lines were similar, except for the TK activity.

Fowlpoxvirus (FPV) strain H and strain FC126 of herpesvirus of turkeys(HVT) did not grow in QT-TK^- cells in the presence of 25～50 μg/ml of BUdR, indicating that QT-TK^- cells were useful for the selection of TK^- viruses. Therefore, QT-TK^- cells were thought to be useful for the construction of recombinant avian viruses that have a foreign gene within the TK gene of the viral DNA.

Furthermore, the TK activity induced by FPV-H and HVT FC126 could be measured specifically in QT-TK^- cells. Thus, QT-TK^- cells may also be useful in analyzing the viral TKs of avian viruses.