Ferritin-labelled Antibody Study of RD-114 Virus

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SUMMARY

Comparative studies by the ferritin-labelled antibody technique showed differences between the surface antigens of RD-114 and feline leukaemia viruses (FeLV). Guinea pig and rabbit antisera to RD-114 virus reacted with RD-114 virus but not with FeLV. Dog antiserum to FeLV reacted with FeLV but not with RD-114 virus.

Although RD-114 virus was considered at first to be either a candidate human type C virus or a representative of a new class of feline virus (McAllister et al. 1972, 1973), recent reports confirm the possibility that it is endogenous feline type C virus with properties distinct from those of the previously described feline type C viruses (Fischinger et al. 1973; Livingston & Todaro, 1973; Okabe, Gilden & Hatanaka, 1973; Sarma et al. 1973).

The following virus-infected cell systems were used in this study: the line of human rhabdomyosarcoma (RD) cells infected with either RD-114 virus (McAllister et al. 1973) or with FeLV (F-8) (Oshiro et al. 1971; Riggs et al. 1973); and the line of dog cells (D-17) infected with RD-114 virus or with FeLV (F-8). The D-17 cell line was established in this laboratory from an osteosarcoma which had metastasized to the lung. Virus-infected cells were grown on coverslips in Petri dishes. The nutrient medium consisted of Eagle’s MEM in Earle’s balanced salt solution and contained 10% foetal calf serum. Antiserum to RD-114 virus was prepared by immunizing guinea pigs or rabbits with RD-114 virus grown in RD cells and purified by sucrose density gradient centrifuging. Tagging with ferritin-labelled antibodies consisted of treating the virus-infected cells for 30 min at 37 °C with the antisem against either RD-114 virus or FeLV, washing thoroughly with phosphate-buffered saline solution (pH 7.2) and then treating with ferritin-labelled goat anti-(guinea pig or rabbit) γ-globulin-serum. The antibody globulins were coupled to ferritin using the m-xylylene diisocyanate as described by Singer (1959) and modified by Rifkind, Hsu & Morgan (1964).

Application of ferritin conjugated antibody technique revealed distinct antigenic differences between RD-114 virus and FeLV. The incubation of dog anti-FeLV serum (Gardner et al. 1970) with either FeLV-infected RD cells or with RD-114 virus-infected RD cells resulted in tagging of FeLV (Fig. 1) but not of RD-114 virus (Fig. 2). Conversely, the incubation of guinea pig anti-RD-114 virus serum with RD-114 virus or FeLV-infected dog cells resulted in tagging of RD-114 virus (Fig. 3), but not of FeLV (Fig. 4). Similar results were obtained when rabbit anti-RD-114 virus serum was used as the intermediate serum and followed by ferritin-labelled goat anti-rabbit γ-globulin serum (Figs. 5, 6). When the same antisera were tested by the indirect fluorescent antibody technique, the results were similar to those obtained with ferritin-labelled antibodies.

The application of the ferritin conjugated antibody technique, using guinea pig or rabbit anti-RD-114 virus sera in conjunction with an antiserum to FeLV, identified specific reactivity with the homologous antisera and the lack of reactivity with heterologous antisera. These observations demonstrated clearly that the surface antigens of RD-114 virus differ...
Fig. 1. Feline leukaemia virus particles are tagged with ferritin-labelled antibody when treated with anti-feline sarcoma virus serum.

Fig. 2. RD-114 virus is not tagged when treated with anti-feline sarcoma virus serum. Note that ferritin is caught in a vacuole next to a budding virus particle but no tagging occurs.

Fig. 3. RD-114 virus is tagged with ferritin-labelled antibody when treated with guinea pig anti-RD-114 virus serum.

Fig. 4. Feline leukaemia virus is not tagged when treated with guinea pig anti-RD-114 virus serum.

Fig. 5. RD-114 virus particles are tagged with ferritin-labelled antibody when treated with rabbit anti-RD-114 virus serum.

Fig. 6. Feline leukaemia virus is not tagged when treated with rabbit anti-RD-114 virus serum.

from those of feline leukaemia viruses (McAllister et al. 1972). This is in accord with the report of other differences between RD-114 and FeL viruses released from RD cells (McAllister et al. 1973), and supports other studies which show that the major internal protein component (gs-1) of RD-114 virus differs from that of feline leukaemia viruses (Gilden, Lee & Long, 1972; Oroszlan et al. 1972). Moreover, Klement & McAllister (1972), using rabbit
anti-RD-114 virus serum, showed by serum neutralization tests that RD-114 virus differed from feline leukaemia virus. Finally, Boone, Church & McAllister (1973), using the paired label antibody technique, demonstrated the uniqueness of the cell surface antigens induced in RD cells infected with RD-114 virus or FeLV.

These studies indicate that when the RD-114 virus (an endogenous feline type C virus) or the feline leukaemia virus are grown in and released from RD cells, their surface antigens show no relationship demonstrable by the present methods.

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REFERENCES


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Short communications


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