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Syncytia formation of human transformed cell lines by simian sarcoma virus type I (SSV-I/SSAV-I).

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Abstract

Human cells derived from malignant tumors (HeLa, HEp-2 and KB) and human cells transformed by tumor viruses (KCand RSb) formed syncytia by simian sarcoma virus type I (SSV-I/SSAV-I), but human diploid or non-transformed cells (WI-38, HEL and HEC) did not.

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—— BRIEF NOTE ——

SYNCYTIA FORMATION OF HUMAN TRANSFORMED CELL LINES BY SIMIAN SARCOMA VIRUS TYPE I (SSV-I/SSAV-I)

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Abstract. Human cells derived from malignant tumors (HeLa, HEp-2 and KB) and human cells transformed by tumor viruses (KC and RSb) formed syncytia by simian sarcoma virus type I (SSV-I/SSAV-I), but human diploid or non-transformed cells (WI-38, HEL and HEC) did not.

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Several RNA tumor viruses induce cell fusion, leading to syncytia formation in some types of cells (1–13). Simian sarcoma virus type I and simian sarcoma associated virus type I complex (SSV-I/SSAV-I), a primate C-type RNA tumor virus originally isolated from a woolly monkey fibrosarcoma (14), is known to induce syncytia formation in XC cells (15). XC cells are a Wister rat cell line transformed by the Prague strain of Rous sarcoma virus (16).

We investigated syncytia formation in several human cultured cells which originated from malignant tumor, virus-transformed cells, or normal embryonic cells by SSV-I/SSAV-I.

SSV-I/SSAV-I obtained from Dr. R. R. Friis (Giessen, West Germany) was infected to human embryonic lung cells (HEL) which were pretreated with 20 μg/ml of polybrene in the culture medium for 30 min. Progeny virus production was detected by XC syncytia formation (15) and electron microscopy (EMS). One week after virus infection, XC syncytia formation was detected and EMS using the ultrathin section method revealed C-type virus particles but no other virus or mycoplasma was observed. In the mock-infected control cells, no virus-like particles were detected. SSV-I/SSAV-I producing HEL was cocultivated

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with several human cultured cells in 6 cm dishes as follows: 2.5×10^5 cells of SSV-I/SSAV-I producing HEL were mixed with 1×10^6 cells of each human cultured cells to test for syncytia formation. After overnight incubation at 37°C, each dish was fixed in methanol and stained with Giemsa. The presence of syncytia was observed under a light microscope.

HeLa, HEp-2 and KB cells which were derived from human malignant tumors formed syncytia when cocultivated with SSV-I/SSAV-I producing HEL (Fig. 1). KC cells (118MG-EH cells), a human glioma cell line transformed by Rous sarcoma virus, and RSb cells, human embryonic cells transformed by simian virus 40 and Rous sarcoma virus, also formed syncytia when cocultivated with SSV-I/SSAV-I producing HEL (Fig. 2). No syncytia formation was observed in the control culture with mock-infected HEL. On the other hand, WI-38, HEL and human embryonic cells (HEL) did not form syncytia when

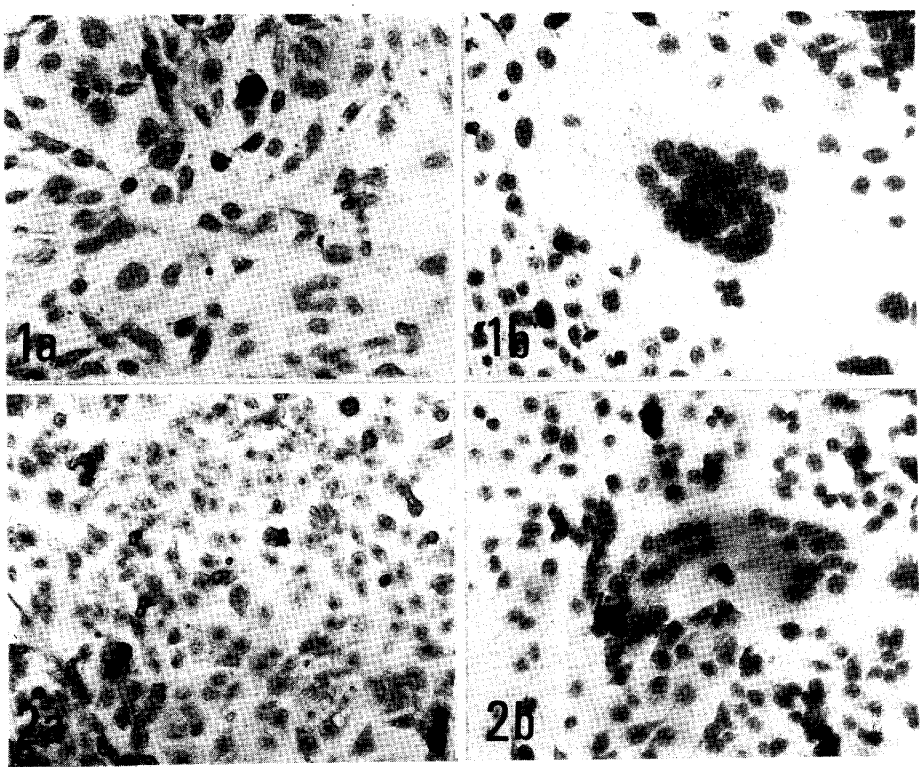

Fig. 1a: RSb cells cocultivated with virus non-infected HEL. ×300
Fig. 1b: Syncytia formation by cocultivation of RSb cells with SSV-I/SSAV-1 producing HEL. ×300
Fig. 2a: KB cells cocultivated with virus non-infected HEL. ×300
Fig. 2b: Syncytia formation by cocultivation of KB cells with SSV-I/SSAV-I producing HEL. ×300

cocultivated with SSV-I/SSAV-I producing HEL. WI-38 cells are diploid cells. HEL and HEC were primary culture from our laboratory and were used between 5 to 10 passages.

Human cultured cells which formed syncytia in response to SSV-I/SSAV-I were transformed cells, while neither diploid nor non-transformed cells, so far tested formed syncytia. Syncytia formation by RNA tumor viruses are confined to the specific cells represented by rat XC and human KC cells both carrying Rous sarcoma virus genome. But our results indicate that SSV-I/SSAV-I would form syncytia over a wide range of human transformed cells and does not always require Rous sarcoma virus genome for syncytia formation.

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