

# *Acta Medica Okayama*

---

*Volume 33, Issue 2*

1979

*Article 8*

APRIL 1979

---

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

Munehiko Ocho\*

Hajime Ogura<sup>†</sup>

Terukazu Tanaka<sup>‡</sup>

Takuzo Oda\*\*

\*Okayama University,

<sup>†</sup>Okayama University,

<sup>‡</sup>Okayama University,

\*\*Okayama University,

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

Munehiko Ocho, Hajime Ogura, Terukazu Tanaka, and Takuzo Oda

## Abstract

Human cells derived from malignant tumors (HeLa, HEp-2 and KB) and human cells transformed by tumor viruses (KCa 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.

**KEYWORDS:** simian sarcoma virus, syncytia formation, cell fusion, human transformed cell lines, human cell strains

---

\*PMID: 224650 [PubMed - indexed for MEDLINE]

Copyright (C) OKAYAMA UNIVERSITY MEDICAL SCHOOL

— BRIEF NOTE —

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

Munchiko OCHO, Hajime OGURA<sup>1</sup>, Terukazu TANAKA  
and Takuzo ODA

*Department of Biochemistry, Cancer Institute, Okayama University  
Medical School, Okayama 700, Japan*

*Received December 22, 1978*

*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.

*Key words:* simian sarcoma virus, syncytia formation, cell fusion, human transformed cell lines, human cell strains

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 Wistar 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

1. Present address: Department of Virology, Cancer Institute, Okayama University Medical School, Okayama 700, Japan.

with several human cultured cells in 6 cm dishes as follows:  $2.5 \times 10^5$  cells of SSV-I/SSAV-I producing HEL were mixed with  $1 \times 10^6$  cells of each human cultured cells to test for syncytia formation. After overnight incubation at  $37^\circ\text{C}$ , 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

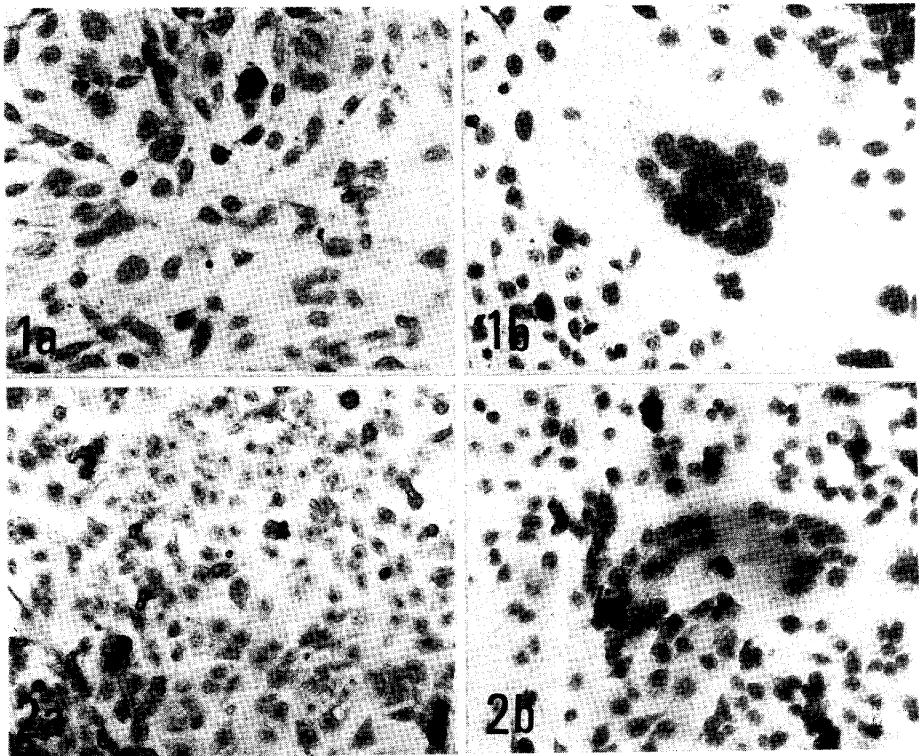


Fig. 1a: RSb cells cocultivated with virus non-infected HEL.  $\times 300$

Fig. 1b: Syncytia formation by cocultivation of RSb cells with SSV-I/SSAV-I producing HEL.  $\times 300$

Fig. 2a: KB cells cocultivated with virus non-infected HEL.  $\times 300$

Fig. 2b: Syncytia formation by cocultivation of KB cells with SSV-I/SSAV-I producing HEL.  $\times 300$

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.

*Acknowledgment.* This work was supported by a Grant-in-Aid for Cancer Research from the Ministry of Education, Science and Culture of Japan.

#### REFERENCES

1. Klement, V., Rowe, W. P., Hartley, J. W. and Pugh, W. E. : Mixed culture cytopathogenicity: A new test for growth of murine leukemia viruses in tissue culture. *Proc. Natl. Acad. Sci. USA* **63**, 753-758, 1969.
2. Wong, P. K. Y., Yuen, P. N. and Kaufman, S. J. : Induction of syncytia by moloney leukemia virus in myoblasts defective in differentiation. *J. Virol.* **23**, 436-438, 1977.
3. Koga, M. : Titration of murine leukemia viruses with rat cell line RFL. *J. Virol.* **23**, 436-438, 1977.
4. Rangan, S. R. S., Wong, M. C., Moyer, P. P. and Jenses, E. M. : Cytopathogenic test for feline leukemia virus infections. *Appl. Microbiol.* **23**, 628-636, 1972.
5. Rand, K. and Long, C. : Syncytial assay for the putative human C-type virus, RD-114, utilizing human cells transformed by Rous sarcoma virus. *Nature (New Biol)* **240**, 187-190, 1972.
6. Klement, V., Mcallister, R. M. : Syncytial cytopathic effect in KB cells of a C-type RNA virus isolated from human rhabdomyosarcoma. *Virology* **50**, 305-308, 1972.
7. Noronha, F., Dougherty, E., Poco, A., Gries, C., Posc, J. and Richard, C. : Cytological and serological studies of a feline endogenous C-type virus. *Arch. Ges. Virusforsch.* **45**, 235-248, 1974.
8. Ahmed, M., Korol, W., Yeh, J., Schildovsky, G. and Mayyasi, S. A. : Detection of Mason-Pfizer virus infection with human KC cells carrying Rous virus genome. *J. Natl. Cancer Inst.* **53**, 383-387, 1974.
9. Ahmed, M., Korol, W., Larson, D. L., Harewood, K. R. and Mayyasi, S. A. : Interactions between endogenous baboon type C virus and oncogenic viruses. 1. Syncytium induction and development of infectivity assay. *Int. J. Cancer* **16**, 747-757, 1975.
10. Diglio, C. A. and Ferrer, J. F. : Induction of syncytia by the bovine C-type leukemia virus. *Cancer Res.* **36**, 1056-1067, 1976.
11. Ferrer, J. F. and Diglio, C. A. : Development of an *in vitro* infectivity assay for the C-type bovine leukemia virus. *Cancer Res.* **36**, 1068-1073, 1976.
12. Graves, D. C. and Ferrer, J. F. : *In vitro* transmission and propagation of the bovine leukemia virus in monolayer cell cultures. *Cancer Res.* **36**, 4152-4159, 1976.
13. Ogura, H., Paulsen, J. and Bauer, H. : Cross-neutralization of ovine and bovine C-type leukemia virus-induced syncytia formation. *Cancer Res.* **37**, 1486-1489, 1977.
14. Theilen, G. H., Gould, P., Fomler, M. and Dungworth, D. L. : C-type virus in tumor tissue

- of a woolly monkey (*Lagothrix*) with fibrosarcoma. *J. Natl. Cancer Inst.* **47**, 881-889, 1971.
15. Rangan, S. R. S., Wong, M. C., Ueberhorst, P. J. and Ablashi, D. V.: Mixed culture cytopathogenicity induced by virus preparations derived from cultures infected by simian sarcoma virus. *J. Natl. Cancer Inst.* **49**, 571-577, 1972.
16. Svoboda, J.: Presence of chicken tumor virus in the sarcoma of the adult rat inoculated after birth with Rous sarcoma tissue. *Nature* **186**, 980-981, 1960.