

PHENOTYPIC MIXING OF VESICULAR STOMATITIS VIRUS (VSV)
WITH VACCINIA VIRUS

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Phenotypic mixing (PM) is frequent in dual infections also with unrelated enveloped viruses (1, 2), including combinations as different as VSV and herpes simplex virus (3). To extend the spectrum tested for PM, we employed VSV, a rhabdovirus, and vaccinia virus, a poxvirus, because poxviruses are an extraordinary family of enveloped viruses, which do not mature by the budding process.

Mink Mv1Lu cells were first infected with vaccinia virus (0.025 PFU/cell). After 24 hr incubation at 37 °C only first signs of CPE developed, then the culture was superinfected with VSV at 20 PFU/cell; the progeny was harvested after 8 hr incubation. In parallel with pure-grown VSV, the harvests were appropriately diluted, mixed with anti-VSV and/or with anti-vaccinia serum (as well as with control sera) and incubated for 60 min at 37 °C. Finally, the reacting mixtures were diluted 10 times, plated on confluent Petri dish cultures of mink cells, to assay selectively the virions with VSV genome (plaques counted after 24 hr).

The Table shows that VSV can mix phenotypically with vaccinia virus. Optimum dilution of anti-VSV serum was 1 : 1000, but a twofold increase of this concentration resulted in neutralization of most of phenotypically mixed VSV virions. This contrasts with the properties of VSV pseudotypes formed with herpes (3) or bovine leukaemia virus (4), which resist the excess of anti-VSV within broad limits and resembles to the PM virions of VSV with antigens of Mason-Pfizer (5) or of reticuloendotheliosis (6) viruses. The present results bring more support for the suggestion that PM might occur between each of families of enveloped viruses.

Virus	Serum treatment		Survival ² (log PFU/ml)
	anti-VSV ¹	anti-pox	
VSV	0	0	9.04
	0	+	8.86
VSV + vaccinia	0	0	8.25
	0	+	8.03
	1000	0	4.49
	1000	+	2.75
	500	0	2.82
	500	+	2.97

¹ Reciprocals of anti-VSV serum dilution in reaction mixtures.

² Titres are calculated for undiluted infection fluids. 0 = no antiserum added.

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