Ultrastructural analysis of HERV-K virus particles produced by human melanoma cells

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Cell lines derived from human germ cell tumors (teratocarcinoma and seminoma) produce large amounts of virus particles of the human endogenous retrovirus type K (HERV-K). These particles are characterized by morphological features such as the lack of an electron lucent area between core and shell and by the fact that most particles adhere to the producing cell[1]. They could never be shown to be infectious. Patients suffering from germ cell tumors develop often high titers of antibodies to HERV-K[2].

Recently it was observed that also patients with melanoma may develop an immune reaction to HERV-K[3, 4]. In melanoma cell lines HERV-K sequences as well as proteins are expressed and reverse transcriptase activity was demonstrated [5].

We show here, that a subclone of the human melanoma cell line UKRV-Mel2 produces virus-like particles, structurally similar to HERV-K. These particles react with monoclonal antibodies directed against HERV-K. Despite their resemblance to human teratocarcinoma derived particles, there are some obvious structural differences, namely the prominent spikes on the viral surface.

1. K. Bieda et al., J. Gen. Virol. **82(3)** (2001) p591.
2. K. Boller et al., J. Virol. **71(6)** (1997) p4581
3. J. Humer et al., Cancer Res. **66(3)** (2006) p1658
4. S. Hahn et al., AIDS Res Hum Retroviruses **24(5)** (2008) p717
5. T. Muster et al., Cancer Res. **63(24)** (2003) p8735

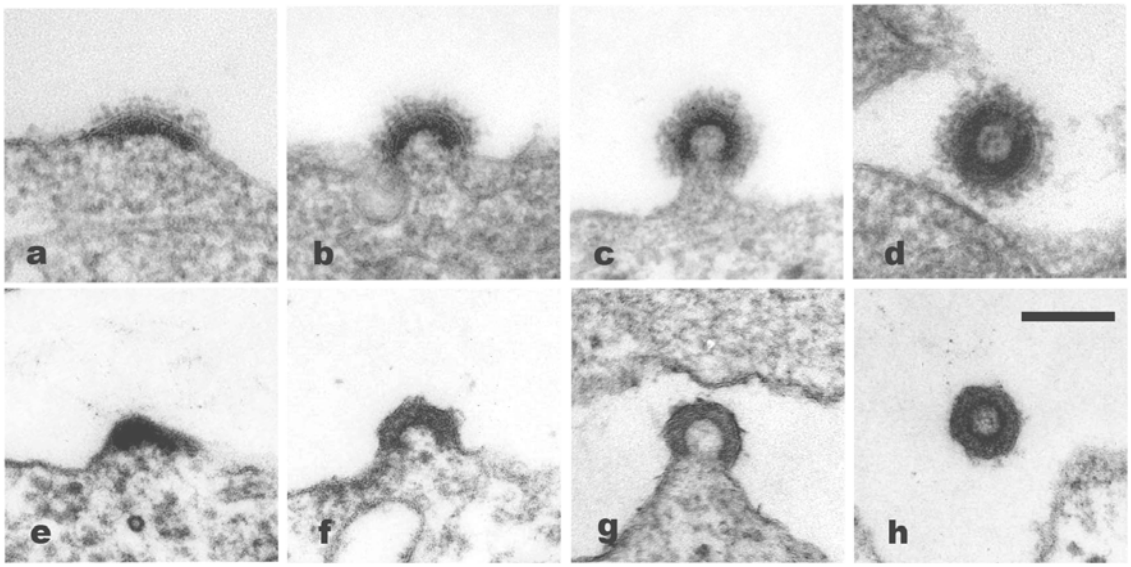

Figure 1. Virus particles of human endogenous retrovirus HERV-K budding from the human melanoma cell line UKRV-Mel2 (a – d) and from the human teratocarcinoma cell line GH (e – f). Particles from melanoma cells show a fuzzy layer of surface proteins while particles from teratocarcinoma cells appear smooth. Bar represents 150 nm.

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