Oncolytic viruses are examined to serve as anticancer therapeutics. It is expected that in addition to direct oncolytic effect their action will also help eliciting a solid antitumor immunity. In presented series of experiments we have employed two HPV16-transformed mouse cell lines, TC-1 and MK16, and reovirus type 3, strain Dearing (RV). Both cell lines are highly susceptible to RV and produce large amounts of infectious virus in vitro. Still, some differences were encountered. When inoculating high doses of infected cells into syngeneic animals their oncogenic activity was strongly suppressed, nearly completely in the case of MK16 cells but less efficiently in the case of more oncogenic TC-1 cells. When immunized animals were challenged with TC-1 cells, the irradiated cells proved to be a much better immunogen that the infected cells. However, when challenged with MK16 cells the opposite was true. In another study we demonstrate that RV replicates preferentially in tumor cells and that the virus is able to overcome cellular adaptation to hypoxia (1% O2) and infect and kill hypoxic tumor cells. RV can both replicate in a hypoxic tumor microenvironment and can cause cytophatic effect and subsequently induce cell death. We found that a large proportion of cells are in hypoxia killed by caspase independent mechanisms. Furthermore, we learned that cell death induced by RV in hypoxic conditions is not caused by autophagy.