THE HOST FACTOR EARLY GROWTH RESPONSE GENE (EGR-1) IS REGULATED DURING VACCINIA VIRUS INFECTION AND PLAYS A CRITICAL ROLE IN VIRAL BIOLOGY

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Host cell factors strongly influence the outcome of viral infections. Poxviruses modify the host cell environment to achieve favorable replication conditions. Here we showed that the early growth response gene (*egr-1*) is one of the host cell factors intensely modulated by *Vaccinia virus* (VACV). The 82-KDa phosphoprotein early growth response factor (EGR-1) belongs to a family of transcription factors that also includes EGR-2-4 and NGFI-B. Its activation moiety is equipped with C_2H_2 zinc fingers. In this study we showed that VACV stimulates EGR-1 protein expression, from 1-18 hours post-infection, via the requirement of ERK/MEK pathway. In addition, fluorescence microscopy analysis revealed that EGR-1 protein is localized in both the nuclear and the cytoplasmic compartment of infected host cells. Furthermore, the knockout (KO) of *egr-1* gene caused a 1 log decrease in virus multiplication and also a decrease in viral plaque size. Interestingly, however, in *egr-1* KO cells the expression of virus genes such as SPI2, H3L, A13L, A14L, D8L and F18R is not altered. Electron microscopy analysis is under way to investigate possible defects in VACV morphogenesis in the absence of *egr-1.*