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Abstract (poster session)

An example of collateral damage: cytomegalovirus infection and immune senescence

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Introduction: Immune senescence defined as the age-associated dysregulation and dysfunction of the immune system is characterised by a loss of protective immunity and by decreased efficacy of vaccines. Recent clinical, epidemiological and immunological studies suggest that Cytomegalovirus (CMV) infection and CMV-driven memory T cell accumulations may be associated with accelerated immune senescence, possibly by restricting the remaining naïve T cell repertoire. However, direct evidence whether and how CMV-infection is implicated in immune senescence is still lacking. Objectives: In this study, we have investigated whether latent mouse CMV (MCMV) infection alters antiviral immunity of young and aged mice. Results: After infection with lymphocytic choriomeningitis virus (LCMV) or recombinant Vaccinia virus (Vac-LCMV-GP) specific antiviral T cell responses were significantly reduced in aged MCMV-infected but not in young mice. More importantly, control of LCMV-replication was more profoundly impaired in aged MCMV-infected mice compared to age-matched or young mice. In addition, MCMV-infection reduced immunisation efficacy in old but not young mice. In contrast to the prevailing hypothesis, we find similar total naïve T cell numbers in MCMV-infected compared to non-infected mice. Instead, MCMV-infection significantly expands the total CD8+ T cell pool by a massive accumulation of effector memory T cells. Conclusions: Based on these results, we propose a new model of increased competition between CMV-specific effector memory T cells and any ‘de novo’ immune response after infection or immunisation of aged individuals. In summary, our results demonstrate for the first time in a mouse model that CMV-infection impairs immunity in old age.