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CD8+ T cell dynamics in untreated and treated hyperacute HIV infection: Implications for HIV vaccines and cure strategies

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Background: Early ART initiation is associated with substantial benefits such as reduced latently infected reservoir size and reduced mortality, but the impact of treatment initiation in hyperacute infection, before peak viremia, has not been determined. We investigated how antigen withdrawal through treatment of hyperacute infection affects phenotype, function and clonal repertoire of HIV-specific CD8+ T cell responses.

Methods: 10 subjects who initiated ART in hyperacute infection (early treatment, ETx) and 12 subjects with untreated hyperacute HIV infection (UTx) were studied. We conducted a comparative longitudinal analysis of the phenotype, functionality and clonal repertoire of HIV-specific CD8+ T cell responses. MHC class I tetramers and ICS assays were used to characterize HIV specific responses. T cell receptors (TCRs) were sequenced from tetramer sorted and bulk CD8+ T cells.

Results: Peak viral loads in ETx were 2 logs lower than UTx. Despite rapid antigen withdrawal, ETx led to detectable HIV specific CD8+ T cell responses with a distinct phenotypic profile, including heightened expression of interleukin-7 receptor alpha (CD127+) compared to untreated subjects (=0.0001). The majority of responses defined by HLA class-1 tetramers in ETx subjects persisted at relatively higher frequencies up to 12 months after initial detection of plasma HIV RNA. In contrast, >50% of the responses in untreated donors quickly became undetectable in the absence of discernible CTL driven escape mutations in the autologous plasma virus sequences. Furthermore, dominant TCR clonotypes of ETx subjects remained relatively stable over time compared to those from UTx donors.

Conclusions: We show that very early ART is associated with HIV specific CD8+ T cell responses that are functionally distinct from UTx responses. Our data show that limiting antigen exposure in the hyperacute stage of infection results in more functionally competent immune responses with potential for long-term survival.

The effect of *Malva* sylvestris extract on blood protein and gamma interferon of *Candida albicans* infected mice

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Various parts of *Malva sylvestris* have different medicinal properties such as antimicrobial activity. In this study the effects of *M. sylvestris* extract on protein electrophoresis pattern and gamma interferon of *C. albicans* infected mice was studied. Sixty female mice were divided randomly in six groups (three treatment groups, Candida, placebo and control groups). Treatment groups received aquatic extract of *M. sylvestrs* (50, 100 and 200 mg/kg) for 20 days every other day via injection in peritoneum. *C. albicans* was injected once after sixth injection of extract. Results showed significant decrease in the amount of albumin in three treatment groups. The β-globulin amount of 50 and 100 mg/kg groups and gamma interferon amount of all three treatment groups were increased significantly in proportion to control group. Clearing the body from pathogen organisms depends on cellular responses. It seems that *M. sylvestris* is capable of stimulating cellular immune response and can be used in studies about *C. albicans*.