

Jihočeská univerzita v Českých Budějovicích

Přírodovědecká fakulta



**Activated CD8<sup>+</sup> T cells contribute to clearance of  
gastric *Cryptosporidium muris* infections**

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Rigorózní práce

České Budějovice 2011



Kváč M., Kodádková A., Sak B., Květoňová D., Jalovecká M., Rost M., Salát J. (2011)  
Activated CD8<sup>+</sup> T cells contribute to clearance of gastric *Cryptosporidium muris*  
infections. *Parasite immunology*. Accepted article. doi:10.1111/j.1365-  
3024.2010.01271.x

**Annotation:** The role of CD4<sup>+</sup> and CD8<sup>+</sup> T-lymphocytes in the development of protective immune response against *C. muris* infection was studied by reconstitution of severe combined immunodeficiency (SCID) mice with well-defined populations of either naive or immune CD8<sup>+</sup> or CD4<sup>+</sup> T-lymphocytes. Significant biological impact of activated CD8<sup>+</sup> T-cells against gastric cryptosporidiosis was approved, since SCID mice reconstituted with these cells were able to recover the infection. Moreover, reconstitution of SCID mice with immune CD8<sup>+</sup> T-lymphocytes resulted in the relevant suppression of oocyst excretion and shortening of patent period. Thus, our results prove the involvement of activated CD8<sup>+</sup> T-lymphocytes in the protection of murine hosts against gastric cryptosporidiosis.

Prohlašuji, že v souladu s § 47b zákona č. 111/1998 Sb. v platném znění souhlasím se zveřejněním své rigorózní práce, a to v úpravě vzniklé vypuštěním vyznačených částí archivovaných Přírodovědeckou fakultou elektronickou cestou ve veřejně přístupné části databáze STAG provozované Jihočeskou univerzitou v Českých Budějovicích na jejích internetových stránkách.

V Českých Budějovicích dne 3. ledna 2011

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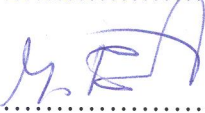
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V Českých Budějovicích dne 20.12. 2010

## Activated CD8<sup>+</sup> T cells contribute to clearance of gastric *Cryptosporidium muris* infections.

Short title: **Role of CD8<sup>+</sup> T-cells during gastric cryptosporidiosis**

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**Key words:** *Cryptosporidium muris*, T-cell mediated immunity, CD8<sup>+</sup> T-lymphocytes, CD4<sup>+</sup> T-lymphocytes

### Abstract

The role of CD4<sup>+</sup> and CD8<sup>+</sup> T-lymphocytes in the development of a protective immune response against *Cryptosporidium muris* infection was studied by the reconstitution of severe combined immunodeficient (SCID) mice with well-defined populations of either naive or immune CD8<sup>+</sup> or CD4<sup>+</sup> T-lymphocytes. Adoptive transfer of both naive and immune CD4<sup>+</sup> T-lymphocyte subpopulations protects SCID mice against cryptosporidiosis. Moreover, a significant biological impact of activated CD8<sup>+</sup> T-cells against gastric cryptosporidiosis was observed. The significant difference in the course and intensity of the infection in reconstituted SCID mice was found to be dependent on the protective function of both the CD4<sup>+</sup> and CD8<sup>+</sup> T-cell populations transferred. While SCID mice reconstituted with either immune or naive CD4<sup>+</sup> or immune CD8<sup>+</sup> T-cell subpopulations resolved the infection within 29, 37 and 51 days post infection, respectively, those reconstituted with naive CD8<sup>+</sup> T-cells suffered from chronic infection similar to control SCID mice. Reconstitution with CD4<sup>+</sup> T-cells resulted in suppression of oocyst excretion and shortening of patent period in comparison with SCID mice reconstituted with CD8<sup>+</sup> T-cells. Thus, although CD4<sup>+</sup> T-cells are considered important in protective immunity, our results are the first to demonstrate involvement of activated CD8<sup>+</sup> T-lymphocytes in the protection of mice against gastric cryptosporidiosis.