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# Anthrax stifles dendritic cells

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Tudor Toma
**Email**: t.toma@imperial.ac.uk

*Bacillus anthracis*, the causative agent of anthrax, can cause immunosuppression with uncontrolled bacteraemia, multisystem dysfunction, and, ultimately, death. The critical virulence factor of *B. anthracis* is lethal toxin (LT), which affects many cell types, including macrophages. The interaction between *B. anthracis* components and dendritic cells results in the activation of immune suppression mechanisms, but the precise nature of these systems has been unclear. In the July 17 Nature, Anshu Agrawal and colleagues at the Emory Vaccine Research Center show that LT impairs the function of dendritic cells and host immune responses by disrupting MAP kinase signaling (*Nature* 2003, **424:**329-334).

Agrawal *et al.* used mouse splenic dendritic cells exposed to LT *in vitro* and *in vivo*. They observed that when stimulated with lipopolysaccharide, dendritic cells did not upregulate costimulatory molecules, secreted greatly diminished amounts of proinflammatory cytokines, and did not effectively stimulate antigen-specific T cells *in vivo*. Injections of LT into mice induced a profound impairment of antigen-specific T- and B-cell immunity. In addition, they showed that LT caused impairment of phosphorylation of p38 and ERK1/2, which mediates the suppressive effects on dendritic cells.

"These data suggest a role for LT in suppressing host immunity during *B. anthracis* infections, and represent an immune evasion strategy, where a microbe targets MAP kinases in dendritic cells to disarm the immune response... LT or its derivatives may also represent potential therapeutic tools in the regulation of deleterious immune responses in autoimmunity or transplantation," conclude the authors.

# References

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