

It takes a village: Mechanism alerts neighbors to amplify immune response

November 18 2010

New research reveals a clever strategy that enables a host organism to outsmart an invading bacterium by counteracting its efforts to suppress the innate immune response. The study, published by Cell Press in the November 24th issue of the journal *Immunity*, describes a mechanism by which an infected cell can quickly alert unsuspecting (and uninfected) neighboring cells that can join the fight, amplify the immune response and defeat the invader.

The pathogen *Shigella flexneri* invades the cells that line the gut and causes Shigellosis, a disorder characterized by [diarrhea](#) and sometimes even death in humans. *S. flexneri* subverts the normal immune response of the host by interfering with the ability of the infected cell to secrete chemicals called chemokines that stimulate inflammation. Inflammation is a complex response to [pathogens](#) that attracts [white blood cells](#) to destroy the bacteria. Despite the documented ability of *S. flexneri* to suppress inflammation in infected cells, [intestinal cells](#) do secrete large amounts of chemokines and exhibit substantial inflammation during Shigellosis.

Professor Cécile Arrieumerlou from the University of Basel in Switzerland led a study designed to investigate the molecular mechanisms that control inflammation during bacterial infection. Using a sophisticated microscopic technique that allowed analysis of *S. flexneri* infection at the single cell level, the researchers discovered that activation of proinflammatory signaling pathways is propagated from infected cells to adjacent uninfected cells, leading to chemokine

secretion from the bystander cells. "We found that this mechanism was mediated by specialized intercellular connections called gap junctions that allowed the infected cells to communicate with neighboring uninfected cells," explains Prof. Arrieumerlou.

Taken together, the results show that even when the immune response is suppressed in the infected cell, alerted bystanders can amplify the inflammatory response. "We have identified a novel mechanism of cell to cell communication that amplifies the immune response against bacterial infection by rapidly spreading signals via gap junctions to yet uninfected cells," concludes Prof. Arrieumerlou. "This mechanism enables the host to circumvent the immunosuppressive activity of [bacteria](#) and to massively amplify [inflammation](#) during bacterial infection."

Provided by Cell Press

Citation: It takes a village: Mechanism alerts neighbors to amplify immune response (2010, November 18) retrieved 19 April 2024 from <https://medicalxpress.com/news/2010-11-village-mechanism-neighbors-amplify-immune.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--