Rubino I., Coste A., Roger T., Le Roy D., Jaton K., Boeckh M., Monod M., Latgé J.P., Calandra T. and Bochud P.Y. (2012). Species-specific recognition of *Aspergillus fumigatus* by Toll-like receptor 1 and Toll-like receptor 6. *Journal of Infectious Diseases 205:* 944-954.

BACKGROUND:

Aspergillus fumigatus causes invasive aspergillosis, a potentially fatal infection in oncohematological patients. Innate immune detection of A. fumigatus involves Toll-like receptor (TLR) 4 and TLR2, which forms a heterodimer with either TLR1 or TLR6. The role of those coreceptors in Aspergillus sensing is unknown.

METHODS:

Cytokine production was measured in bone marrow-derived macrophages (BMDMs) from wild-type (WT) and TLR-deficient mice after incubation with a WT and an immunogenic RodA-deficient (ΔrodA-47) strain of A. fumigatus and in lungs from these mice after intranasal mold inoculation. Aspergillus fumigatus-mediated NF-κB activation was measured in HEK293T cells transfected with plasmids expressing mouse or human TLRs.

RESULTS:

Bone marrow-derived macrophages from TLR1- and TLR6-deficient mice produced lower amounts of interleukin 12p40, CXCL2, interleukin 6, and tumor necrosis factor α than BMDMs from WT mice after stimulation with A. fumigatus. Lungs from TLR1- and TLR6-deficient mice had diminished CXCL1 and CXCL2 production and increased fungal burden after intranasal inoculation of ΔrodA A. fumigatus compared with lungs from WT mice. ΔrodA strain-mediated NF-κB activation was observed in HEK293T cells expressing mouse TLR2/1, mouse TLR2/6, and human TLR2/1 but not human TLR2/6.

CONCLUSIONS:

Innate immune detection of A. fumigatus is mediated by TLR4 and TLR2 together with TLR1 or TLR6 in mice and TLR1 but not TLR6 in humans.