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MOLECULAR ASPECTS

MicroRNA-155 knockout mice are susceptible to Mycobacterium tuberculosis infection

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summary

MicroRNAs (miRNAs) are short, conserved, non-coding RNA molecules that repress translation, followed by the decay of miRNA-targeted mRNAs that encode molecules involved in cell differentiation, development, immunity and apoptosis. At least six miRNAs, including microRNA-155 (miR-155), were upregulated when bone marrow-derived macrophages from C57BL/6 mice were infected with Mycobacterium tuberculosis Erdman. C57BL/6 mice intravenously infected with Erdman showed up-regulation of miR-155 in livers and lungs. Following infection, miR-155-deficient C57BL/6 mice died significantly earlier and had significantly higher numbers of CFU in lungs than wild-type mice. Moreover, fewer CD4⁺ T cells, but higher numbers of monocytes and neutrophils, were present in the lungs of Erdman-infected miR-155 knockout (miR-155^{-/-}) than of wild-type mice. These findings indicated that miR-155 plays a critical role in immune responses to M. tuberculosis.

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