

论著

军团菌逃逸巨噬细胞杀伤效应的分子机制研究

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摘要 目的: 通过体外构建军团菌感染的细胞模型, 探索caspase 3激活与军团菌逃逸巨噬细胞杀伤作用的相互关系。方法: 军团菌感染巨噬细胞后, 用激光共聚焦显微镜和荧光阅读机测定胞内caspase 3的活性。并在caspase 3抑制剂应用前后对军团菌在发生凋亡的巨噬细胞内的生长复制状况进行检测。结果: 激光共聚焦显微术以及caspase 3荧光底物的分析结果显示, 嗜肺性军团菌毒力株感染巨噬细胞后能够大幅度激活caspase 3, 而去除毒力的突变菌株不具备这种能力。军团菌在感染巨噬细胞后不同的时间内, 军团菌在胞内不断地复制繁殖, 而毒力去除的突变株却没有复制能力。当胞内caspase 3的活性被抑制后, 军团菌毒力株的复制繁殖能力也有了显著性的抑制。结论: 军团菌感染巨噬细胞后能够在极短的时间内激活 caspase 3, 并通过诱导巨噬细胞的凋亡来逃逸巨噬细胞的杀菌作用和发挥致病效应。

关键词 [军团杆菌属](#); [逃逸](#); [巨噬细胞](#); [半胱氨酸天冬氨酸蛋白酶3](#)

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Molecular mechanisms involved in the evasion of Legionella from the killing effect of macrophages

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Abstract

AIM: To explore the relationship between caspase activation and the evasion of Legionella from macrophage elimination through a Legionella-infected macrophage model. METHODS: After infected by Legionella, the activity of caspase 3 in macrophages was analyzed by confocal microscopy as well as fluorescence reader. Growth and replication of Legionella in macrophage was assayed. Replication of Legionella was analyzed again to see the effect of caspase 3 inhibition on the growth of Legionella after use of caspase 3 inhibitor. RESULTS: Both confocal microscopy and caspase 3 fluorescent substrate analysis showed that Legionella virulent strain had powerful capability of activating caspase 3 while the mutant non-virulent strain did not have this capability. The virulent strain highly replicated in macrophages and the replication was significantly inhibited by caspase 3 inhibitor. CONCLUSION: Our results indicate that the intracellular caspase 3 is activated shortly after infection by Legionella virulent strain. The evasion of Legionella from the elimination of macrophages may be mediated by caspase 3 activation to a great degree.

Key words [Legionella](#) [Evasion](#) [Macrophages](#) [Caspase 3](#)

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