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论著

流感病毒感染小鼠肺巨噬细胞Dll1和MHC Ⅰ表达研究

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摘要：

目的探讨小鼠肺巨噬细胞Dll1及MHC Ⅰ与细胞毒性T淋巴细胞（CTL）为主的细胞免疫应答的关系，为制备有效的新型抗流感病毒疫苗提供理论依据。方法将小鼠随机分为3组，异型免疫组（用rL H5株重组二联活疫苗免疫）、同型免疫组（用A/H1N1流感病毒免疫）和未免疫感染组（用PBS代替疫苗），不同疫苗免疫小鼠后均感染A/H1N1型流感病毒，比较3组小鼠肺巨噬细胞Notch Dll1及MHC Ⅰ表达情况，并研究干扰素（IFN）γ、T细胞水平变化。结果异型免疫组感染4 d和7 d后，肺巨噬细胞Notch Dll1［分别为（0.01460±0.00125）和（0.01750±0.00196）］及MHC Ⅰ mRNA 表达水平［分别为（0.03050±0.0029）和（0.0495±0.0024）］显著高于感染前［分别为(0.00045±0.00004)和(0.0120±0.0018)］，未免疫感染组感染4 d和7 d后Notch Dll1［分别为（0.01010±0.00107）和（0.01320±0.00143）］和MHC Ⅰ mRNA表达水平［分别为（0.0219±0.0024）和（0.0248±0.0022）］均高于感染前［分别为(0.00032±0.00007)和(0.0090±0.0013)］；异型免疫组感染4 d和7 d，后Notch Dll1和MHC Ⅰ mRNA表达水平均高于同型免疫组［感染4 d和7 d后，Notch Dll1分别为（0.00089±0.00018）和（0.00143±0.00096），MHC Ⅰ mRNA分别为（0.0038±0.0008）和（0.0008±0.0002）及未免疫感染组，差异均具有统计学意义(均P<0.05)。感染后第7天，异型免疫组IFN γ、CD8+T细胞的百分比含量为（3.31±0.34）%，高于同型免疫组和未免疫感染组［分别为（0.38±0.06）%和（1.58±0.27）%］；感染后第5 天，异型免疫组流感病毒量为［（6.26×105）±（3.7×105）］copies/μL，低于未免疫感染组［（6.85×107）±（2×107）］copies/μL，而高于同型免疫组（400±250）copies/μL (均P<0.05)。结论小鼠肺巨噬细胞Dll1及MHC Ⅰ的表达可能在以CTL为主流感病毒异型交叉保护免疫应答反应中起重要作用。

关键词： 流感病毒 巨噬细胞 异型 Notch Dll1 MHC Ⅰ 细胞毒性T淋巴细胞

Notch Dll1 and MHC Ⅰ expression in pulmonary alveolar macrophages of mice infected with influenza virus

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Abstract:

ObjectiveTo study the relationship between Notch ligand Delta like 1 (Dll1), MHC class I molecule (MHC Ⅰ) in mice pulmonary alveolar macrophages (PAM) and cellular immunity response based on cytotoxic T lymphocytes(CTLs) ,and provide theoretical basis for the preparation of vaccine against influenza virus. MethodsMice were randomly divided into 3 groups: heterosubtypic immune group (immunized with recombinant virus vaccine rL H5), homosubtypic immune group (immunized with A/H1N1 influenza virus vaccine), and viral infection group(immunized with PBS). Mice immunized with different vaccines were all infected with A/H1N1 influenza virus. mRNA expression of Notch Dll1 and MHC Ⅰ among 3 groups were compared, levels of IFN γ and T cells in 3 groups were studied. ResultsAt day 4,7 of post infection, in heterosubtypic immune group, mRNA expression of Notch Dll1 ([0.01460±0.00125]), [0.01750±0.00196]) and MHC Ⅰ ([0.03050±0.0029] , [0.0495±0.0024]) were both higher than those before infection ([0.00045±0.00004] , [0.0120±0.0018]) , in viral infection group, mRNA expression of Notch Dll1([0.01010±0.00107] , [0.01320±0.00143]) and MHC Ⅰ ([0.0219±0.0024] , [0.0248±0.0022])were both higher than those before infection ([0.00032±0.00007] , [0.0090±0.0013]); At day 4,7 of post infection , mRNA expression of Notch Dll1 and MHC Ⅰ in heterosubtypic immune group were both higher than those in homosubtypic immune group (Notch Dll1 [0.00089±0.00018] , [0.00143±0.00096] ; MHC Ⅰ [0.0038±0.0008] , [0.0008±0.0002]) and viral infection group, the difference was statistically significant(all P<0.05). At day 7 of post infection, the percentage of IFN γ and CD8+T cells in heterosubtypic immune group was（3.31±0.34）% , which was significantly higher than homosubtypic immune group （ [0.38±0.06] %）and viral infection group ([1.58±0.27] %) ; At day 5 of post infection , viral load of heterosubtypic immune group （ [6.26×105±3.7×105] copies/μL) was lower than that of viral infection group （ [6.85×107±2×107] copies/μL), but higher than that of homosubtypic immune

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group（［400±250］copies/μL）(all P<0.05). ConclusionNotch Dll1 and MHC Ⅰ in mice PAM may play active roles by promoting CTL differentiation during heterosubtypic immune against influenza virus.

Keywords: influenza virus; macrophage heterosubtypic; Notch Dll1; MHC Ⅰ; cytotoxic T lymphocyte

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