Quantitative Microarray of Intact Glycolipid CD1d Interaction and Correlation with Cell-Based Cytokine Production

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摘要

The protein CD1d binds self and foreign glycolipids for presentation to CD1-restricted T cells by means of TCR recognition, and activates TH1 and TH2 chemokines release. In this study, a variety of glycolipid ligands were attached to a microarray surface and their binding with CD1d investigated. An alpha-galactosyl ceramide (alpha-GalCer) bearing a carbamate group at the 6'-OH position was tethered to the surface and the dissociation constant with CD1d determined. Competition assays were used to determine the dissociation constants (Ki) of the new and intact glycolipids. The para-fluoroheptaphenyl-modified alpha-GalCer (18) was found to bind most strongly with CD1d (Ki 0.14 uM), two orders of magnitude stronger than alpha-GalCer and more than three times more selective for IFN-release. Various alpha-GalCer analogs were analyzed and the results showed that the binding affinity of glycolipids to CD1d correlates well with IFN production, but poorly with IL-4 secretion by NKT cells, suggesting that tighter binding ligands could bias cytokine release through the TH1 pathway.

技術優勢

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應用範圍

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