Visualization of MMP12 activity by using membrane-bound FRET

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We describe here the development of a ratiometric FRET reporter specific for MMP12 (LaRee1) that is lipidated and targeted to the plasma membrane. The part of the sensor bearing the FRET donor is internalized only after proteolytic cleavage by MMP12, thereby producing a memory effect on cells with pericellular MMP12 activity. Furthermore, soluble reporters were designed to measure extracellular MMP12 activity not restricted to the plasma membrane with high sensitivity. Both types of sensors were used in combination to investigate MMP12 activity in cultured RAW macrophages and in bronchoalveolar lavage (BAL) from wild-type (WT) and MMP12-knockout (*Mmp12*−/−) mice challenged with particulate matter as a model of acute pulmonary inflammation.

紹介論文

Membrane-bound FRET probe visualizes MMP12 activity in pulmonary inflammation.

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要旨

MMP12 is a metalloproteinase implicated in inflammation. We synthesized a membrane-targeted reporter (LaRee1) based on Foerster resonance energy transfer (FRET) to monitor its activity. LaRee1 detects MMP12 activity by loss of FRET plus internalization of the lipidated fragment. LaRee1 detected MMP12 activity at the surface of activated macrophages in bronchoalveolar lavages from a mouse model of pulmonary inflammation. LaRee1 may become a powerful tool for monitoring lung disease.

参考論文

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