

Technology Offer

Compounds and methods for the detection of calprotectin

Ref.-No. M06/14

Areas of application

Diagnostics, biomarker

Keywords

Calprotectin, ELISA, inflammatory diseases

Development Status

Proof of concept

Commercial Opportunity

The technology is offered for in-licensing and co-development

Publication

J Clin Invest., 2018, 128(5): 1852-1866, „Autoinhibitory regulation of S100A8/S100A9 alarmin activity locally restricts sterile inflammation.“
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Patent Status

EP patent has been granted. (AT, BE, BG, CH, DE, DK, EE, FI, FR, GB, IT, LI, LT, LV, LU, MT, NL, PT, SE, SI)

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Introduction

The calcium-binding proteins S100A8 and S100A9 have been proposed as suitable and reliable biomarkers to indicate the severity of certain inflammatory diseases. Both S100 proteins show strong pro-inflammatory activities in many inflammatory reactions, e.g., sepsis, lung and skin infections, arthritis and autoimmune diseases. However, for the diagnosis and assessment of an inflammatory disease *in vivo* only heterodimers of S100A8/S100A9 are important, while homodimers are not physiological and tetramers inactive. Therefore, when using conventional S100A8/S100A9-ELISAs for quantification of these proteins in biological samples, which are based on diverse antibody combinations against one or both proteins, it currently cannot be differentiated whether the measured values represent the dimeric or tetrameric form. Accordingly, there is a need in the art for new means and methods that allow for a differentiation between S100A8/S100A9 heterodimers and tetramers and an accurate detection of S100A8/S100A9 heterodimers in a biological or patient sample.

Invention

The present invention discloses for the first time that S100A8/S100A9 heterodimers having at least one mutation in the high- or low-affinity calcium binding region of S100A8 or S100A9 are well suited standards for use in a method of detecting S100A8/S100A9 heterodimers in a sample. This is so, because these S100A8/S100A9 heterodimers are no longer able to tetramerize and thus are particularly useful for the reliable evaluation of the amount of S100A8/S100A9 heterodimers in biological samples (e.g. those obtained from the respective patients). The present invention provides methods for detecting, evaluating, diagnosing acute and chronic inflammatory diseases in humans by using the S100A8/S100A9 heterodimer standard of the present invention.

Advantages of the invention

The method of the present invention would allow the recognition of the structural state of S100A8/S100A9 proteins in order to reflect reliably the progression of acute and chronic inflammatory diseases. In particular, this method would allow for the exact quantification of the biological active form of the S100A8/S100A9 complex. Moreover, even the detection of subclinical residual activities of inflammation at an early inflammatory state would be possible.

