Test for early diagnosis of rheumatoid arthritis based on chimeric fibrin and filaggrin peptides

CSIC and the Clinic Foundation have devised an ELISA test using chimeric citrullinated peptides derived from α-fibrin and filaggrin chains for early diagnosis of rheumatoid arthritis. This method, tested with sera from 900 patients, improves sensitivity for diagnosis and may have important prognostic value, identifying patients with aggressive disease and being able to detect the disease when other tests failed.

An offer for Patent Licensing and/or R+D collaboration

Improvement of diagnostic and prognostic RA values

Rheumatoid arthritis (RA) is a systemic autoimmune disease affecting 1% of the world population producing chronic joint inflammation, usually resulting in its destruction. Early diagnosis is mandatory to impair the disease progression by drugs, physiotherapy and, eventually, surgery.

Antibodies to citrullinated (arginine is replaced by a citrulline) proteins/peptides are the most specific serological markers for diagnosing RA. Here it is reported an ELISA assay based on three chimeric citrullinated synthetic peptides from filaggrin and the α-chain of fibrin as antigenic substrates.

This assay has been tested in more than 900 sera of patients with RA, erythematosus systemic lupus, psoriatic arthritis, chronic virus C – hepatitis and of healthy persons, establishing a specificity of 98%, sensitivity of 72-78% (80% when considered together) and positive predictive values greater than 97%. In addition, specificity against other rheumatic populations is higher than 90%, but showing antibody levels very low compared to RA patients. Analyses performed in early RA patients show better results as marker of joint destruction determined by radiography.

Early, intermediate and late symptoms of rheumatoid arthritis (left to right)

Main advantages and applications

- Covalently bonded citrullinated peptides of α-fibrin and filaggrin as antigens to detect serum antibodies show high sensitivity and specificity for RA when compared in a large series of patients with various rheumatic conditions in an early stage of disease.
- Results comparable to those obtained with commercial tests (CCP2 and CCP3). Ability to detect RA in the sera of patients that were no detected using the CCP2 test.
- Antibodies to these peptides can be good markers in patients with poor radiographic outcome and that need more aggressive therapy from the beginning of the diagnostic.
- Very useful in combination with other peptides to increase sensitivity in the identification of particular subsets of RA patients.
- Tested as an electrochemical immunosensor for further development of an automated, point-of care, rapid and low-cost diagnostic device.

Patent Status

Patent granted in USA and Europe

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CSIC
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FUNDACIÓ CLÍNIC BARCELONA