

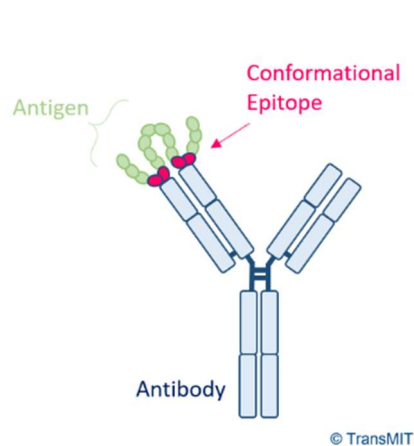
Method and kit for diagnosis of parasitic/fungal infections and de novo allergen identification via recognition of conformational epitopes (DNA-ICE)

in vitro diagnostics - IVD, epitopes, parasitic infections, allergens, fungal infections, diagnostic method

DESCRIPTION OF TECHNOLOGY

DNA-ICE is a newly developed method for *in vitro* diagnosis of fungal or parasitic infections, as well as identification of novel allergens via bonding of specific immunoglobulin E (IgE) to conformational epitopes under nearly natural conditions.

The nature-like bonding conditions of allergen and IgE recognition are achieved by attaching the IgE as molecular probe to a surface by use of a linker, which provides sufficient distance to the surface to prevent the deformation of the IgE.



The surface may be a macroscopic solid phase (if implemented as quick-test kit) or the surface of magnetic beads in case of implementation as automated laboratory test.

Because of the near-natural bonding conditions, the test is especially sensitive for detecting allergens, either known ones or novel yet unknown allergens.

APPLICATION FIELDS

- *In vitro* diagnostics e.g. ELISA Kits
- Fungal or parasitic infection diagnosis
- Discovery of yet unknown allergens (via conformational epitopes, especially relevant for respiratory allergens)
- Detection of already known allergens e.g. in food

AT A GLANCE ...

Application Fields

- Allergen Identification
- *In vitro* diagnostics of fungal or parasitic infections
- Tropical infectious diseases
- Human/animal/environmental and other biological samples

Business

- *In vitro* diagnostics manufacturers
- Research Institutions (e.g. tropical medicine, disease control & prevention)

USP

- Identification of **novel** allergens as well as diagnosis of infections with already known allergens
- Preservation of 3D folding of conformational epitopes during diagnostic recognition
- Simple process and screening results within a few hours

Development Status

- Technology concept formulated (TRL2)

Patent Status

Priority application filed on 15.07.2022 at the European Patent Office.
PCT application is possible.

ADVANTAGES OVER THE PRIOR ART

Current technologies are quite expensive, time consuming and work best with known (linear epitope) allergens.

The DNA-ICE method provides the following advantages:

- Universal applicability
- Preservation of conformational epitopes' 3D folding structure
- Identification of novel allergens and allergies
- Simple and fast (results within a few hours)

STATE OF PRODUCT DEVELOPMENT

The application as a tool for identifying yet unknown allergens has already been shown to work in a model experiment.

The model experiment for proving the application as diagnostic method is currently under way.

Cooperation for developing a certain IVD-test, for example regarding infections with Schistosoma, Taenia, Echinococcus, parasitic nematodes or fungal pathogens etc. are welcome.

MARKET POTENTIAL

The most common chronic diseases in humans are allergic airway diseases like asthma or allergic rhinitis. Between 10-50% of the population, depending on geographic location, are affected by allergic rhinitis. (WHO 2022)

GAFFI estimates that worldwide over 300 million people are afflicted with various forms of fungal infections and around 1.5 billion people are infected with soil-transmitted helminths alone, according to WHO, 2022.

Due to changing climate and weather patterns and globalisation, fungi and plants need to adapt and parasites, together with their vectors, are also more likely to spread to new territories and increase the likelihood of parasitic infections.

COOPERATION OPPORTUNITIES

On behalf of Justus-Liebig-Universität Giessen, TransMIT GmbH is looking for cooperation partners for further development or licensees worldwide.

References:

Global Action For Fungal Infections (GAFFI), 2022
<https://gaffi.org/why/fungal-disease-frequency/>

World Allergy Organization (WAO), 2022
<https://www.worldallergy.org/UserFiles/file/WorldAllergyWeek2022Announcement-final.pdf>

World Health Organization (WHO), 2022
<https://www.who.int/news-room/fact-sheets/detail/soil-transmitted-helminth-infections>

A TECHNOLOGY OF



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