

## Technology Offer

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### Branch

drug therapy, type 1 diabetes

### Patent Situation

EP patent application filed  
(WO 2015/154795 A1)

### Offer

license or co-development

### Key Words

oral drug therapy, multiple sclerosis,  
drug repositioning

### Fraunhofer Institute for Molecular Biology and Applied Ecology IME

Branch for Translational Medicine  
and Pharmacology

Industriepark Höchst, Gebäude G879  
65926 Frankfurt am Main

Contact:

Prof. Dr. Mike J. Parnham  
phone: +49 69 8700-25071  
michael.parnham@ime.fraunhofer.de

[www.ime.fraunhofer.de](http://www.ime.fraunhofer.de)

## COMBINATION THERAPY OF TYPE 1 DIABETES

### Introduction

Type 1 diabetes (T1D) is a serious autoimmune disease which leads to the progressive destruction of insulin-producing  $\beta$ -cells in the islets of Langerhans of the pancreas. Without insulin replacement therapy, the resulting high blood glucose is ultimately fatal. Even with insulin treatment, long-term effects, such as blindness are unavoidable. Use of targeted drug monotherapy, as with anti-CD3 antibodies that target autoaggressive T cells, is of limited use, as the autoimmune response recovers. Combination therapy may be more effective.

### Invention

The invention relates to the use of combination therapy of T1D with two drugs each specifically targeted to a different mechanism. Treatment with anti-CD3 monoclonal antibodies (MAbs) is given together with a MAb targeted to a chemokine protein that selectively directs the migration of lympho-

cytes to sites of inflammation or injury. The major advantage of this combination therapy is that by slowing the recruitment of damaging T cells, the duration of action of the anti-CD3 MAbs in T1D is considerably prolonged, as shown in animal experiments. The new treatment approach, involving the neutralisation of damaging lymphocytes and the delayed recruitment of replacement cells to the  $\beta$ -cells, offers a new possibility to improve the drug therapy of T1D.

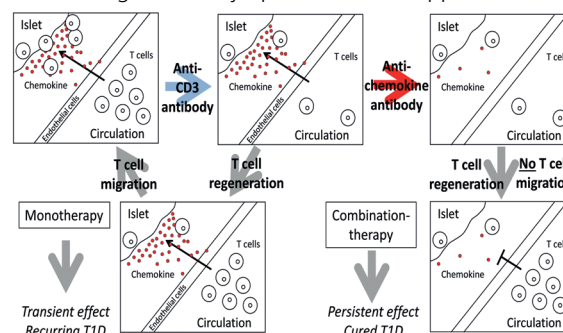
### Market Potential

Commercial applications:

- combination drug therapy of T1D
- combination therapy of other autoimmune diseases
- add-on therapy for chronic inflammatory and neurodegenerative diseases

### Development Status

The therapy approach has been laboratory tested and shown to prolong considerably the suppression of experimental T1D in mice.



Autoreactive T cells invade pancreatic islets, drawn by autoantigen and chemoattractive chemokines (top left). Anti-CD3 MAb in T1D deletes reactive T cells (top middle), but these regenerate and migrate again into islets, causing recurrence of T1D (bottom left). Anti-chemokine antibody neutralises chemokine, inhibiting T cell migration (top right) and synergises with anti-CD3 MAb to cause prolonged benefit in T1D (bottom right).