Technology Offer

Liposome-based immunotherapy for type 1 diabetes

Summary

Two Catalan research groups experienced in nanoparticles and immunology of the diabetes have developed a new nanotherapy based on liposomes to treat autoimmune disorders, preferably type 1 diabetes. The groups are seeking companies working in autoimmune diseases or diabetes for technical cooperation and/or license agreement to bring it to the market.

Expiration Date 15 February 2017
Reference TOES20150817001
Profile link

Details

Description

Type 1 Diabetes (T1D) is one of the most common metabolic diseases in childhood and its incidence is growing in developing countries. In addition, T1D has been increasing throughout the world at 3% per year in recent decades. The peak age for diagnosis of T1D is 12-14 years, but the average age of T1D onset has decreased in the past two decades and a second peak at 4-6 years has been observed. T1D can also be diagnosed in adults. Currently, there is no treatment to restore endogenous insulin secretion in patients with T1D and lifelong insulin therapy is required. Additional, health problems often develop later in life. Because of this and its chronic nature T1D is a costly disease, not only for the affected individual and his/her family, but also for the health authorities. Consequently, the development of new therapies to induce long-term tolerance has been an important medical health challenge.

Researchers from two Catalan research groups focused on nanoparticles and diabetes have developed a technology that uses autoantigen-encapsulating liposomes for the prevention or treatment of autoimmune disorders, preferably T1D, in preference during the pre-clinical state. The invention is based on a previous strategy of the group, consisting on a cell immunotherapy based on autologous dendritic cells (DCs) loaded with apoptotic β-cells for the treatment of autoimmunity in experimental T1D.
To overcome the difficulties of apoptotic β-cells source, a synthetic therapy based on liposomes rich in PS (phosphatidylserine) loaded with insulin peptides has been developed.
The researchers demonstrated that the present liposomes are effectively engulfed by DCs, thus inducing tolerance to the antigen and down-modulating the autoimmune cascade. This process is able to decrease the incidence and delay the onset of experimental T1D.
Apoptotic mimicry provided by liposomes can offer a solution to the complexity of cell-based therapies with many benefits, as they are low-cost, easy to produce and standardize, to generate on large-scale and customize.

The groups are seeking pharmaceutical or biotech companies working in diabetes or autoimmunes diseases for license or technical cooperation agreement to bring it to the market.

Advantages and Innovations

- The antigen-specificity of treatment would not require immunosuppressants

- The potential for personalizing the treatment makes it a promising strategy for the clinical use

- The facility of manufacture, standardization and relative low-cost of production are key characteristics for the development of the therapy

Stage of Development

Under development/lab tested

IPR Status

Patent(s) applied for but not yet granted

Keywords

Technology

06001013	Medical Technology / Biomedical Engineering
06001015	Pharmaceutical Products / Drugs
06004	Micro- and Nanotechnology related to Biological sciences

Market

05003005	Drug delivery and other equipment
05005003	Endocrinology
05006	Anatomy, Pathology, Immunology, Physiology
05007002	Pharmaceuticals/fine chemicals
05007007	Other medical/health related (not elsewhere classified)

NACE

M.72.1.1	Research and experimental development on biotechnology
Q.86.1.0	Hospital activities
Q.86.9.0	Other human health activities

Open for EOI : Yes

Dissemination

Send to Sector Group

Bio Chem Tech

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
French
Spanish

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

- Type of partner sought: Pharmaceutical and biotech companies

- Specific area of activity of the partner: Autoimmune diseases, especially Type 1 diabetes.

- Tasks to be performed by the partner sought: development the technology to bring it to the market

Type of Partnership Considered

License agreement
Technical cooperation agreement

Technology Offer

Mitochondrial dysfunction and targeting

Summary

A French biotech company is focused on detection of mitochondrial injury, a key regulator of cell death. They have developed a platform combining specific screening assays (in-vitro testing) to detect the toxicity and efficacy of compounds. It is an unique mechanistic platform to identify compounds which target mitochondria with applications in cancer, cardio-protection, neuro-protection, diabetes, obesity. Research cooperation agreement as well as services agreement are sought.

Expiration Date	27 April 2017
Reference	TOFR20160121002
Profile link	

Details

Description

Organo-toxicity risk especially drug-induced liver injury (DILI) in humans is difficult to predict using classical in vitro cytotoxicity screening and regulatory animal studies. This explains why numerous compounds are stopped during clinical trials or withdrawn from the market due to hepatotoxicity.

The French company's multi-parametric platform performed on both isolated mitochondria and cells in culture helps to improve early prediction of organo-toxicity risks in human.

This assay is also a valuable tool for assessing the mitochondrial toxicity profile and investigating the mechanism of action of new compounds and marketed compounds.

The French biotech company has developped several mitochondrial assays on its 3 proprietary platforms:
1/ toxicity assays on isolated healthy mitochondria allowing detection of mitochondrio-toxic compounds presenting toxicity risk on human health (hepato- or cardio-toxicity) completed with cellular assays;
2/ efficacy assays on healthy and tumor mitochondria allowing the identification of tumor specific-compounds and their mechanism of action;
3/ targeting assays (validation of mitochondrial targets, mitochondrial protection assays).

The main application fields of the technology are: toxicology, oncology, cardio-protection, neuro-protection, metabolic diseases.

Nowadays the biotech company is looking for research cooperation agreement as well as services agreement with academics, industries, SMEs active in the area of research in biology, chemistry.

Advantages and Innovations

Both mitochondrial integrity and functionnality are measured in such very innovative assays, reflecting the global mitochondrial behaviour. These in vitro alternative methods are of economic and ethical interest (medium throughput, low cost, high predictivity, reduction of animal experimentation).

Experiments performed directly on purified mitochondria allow the identification of compounds with direct mitochondrial targeting.

Stage of Development

Already on the market

IPR Status

Secret Know-how

Profile Origin

Other

Keywords

Technology

06001015	Pharmaceutical Products / Drugs
06002002	Cellular and Molecular Biology
06002007	In vitro Testing, Trials
06002010	Toxicology

Market

04006	Cellular and Molecular Biology
04009	In vitro Testing, Trials
04012	Toxicology

NACE

M.72.1.1	Research and experimental development on biotechnology

Open for EOI : Yes

Dissemination

Send to Sector Group

Healthcare

Client

Type and Size of Organisation Behind the Profile

Industry SME <= 10

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Languages Spoken

English
French

Client Country

France

Partner Sought

Type and Role of Partner Sought

- Type of partner sought:
The partner sought is an industrial partner (SME or large company) or an academic team. The partner is interested in mitochondrial-targeting compounds in oncology, cardio-protection...

- Specific area of activity of the partner:
research in biology, chemistry.

- Role of partner:
The partner sought develops potential therapeutic compounds and needs expertise to set-up specific assays to understand compound mechanism of action or toxicity. The assays can be valorized by the partner as an innovative method.

- Task to be performed by the partner sought:
1) Using the proprietary platforms in order to perform a research cooperation agreement or
2) Partners interested in using in vitro alternative methods through services agreement.

Type of Partnership Considered

Services agreement
Research cooperation agreement

New tool for molecular farming: Novel DNA methylation system or epigenetic breeding tool for the generation of transgene-free plants with modified phenotype

Summary

A German research organization offers a novel DNA methylation system. It allows targeted generation of economic plants with a phenotype modified by gene silencing, while no foreign DNA is contained in the produced plant. Excellent opportunities are opened for new plant breeding techniques (NPBT) and the development of high value crops for health, chemical and agricultural sectors. Licensing, technical cooperation and research partnership agreements are offered to industrial or academic partners.

Expiration Date	30 July 2017
Reference	TODE20150521003
Profile link	

Details

Description

The mission of the German research organization is to do research and development in the field of plant biotechnology. It understands itself as a link between basic research and industrial application. It is running six technology platforms (molecular breeding, virology, tissue culture, genomics, proteomics, epigenetics) which are contributing to the research priorities “fruit diseases, phytoplasmas”, “grapevine biotechnology” and “RNA-mediated gene regulation. Its research activities base upon high-profile national and international R&D collaborations with both industry and academia.

Molecular farming involves the production of pharmaceutical and industrial compounds in plants through advanced technologies and it offers a competitive platform for the manufacturing of high-end products, e.g. plant derived vaccines, commercially valuable proteins and small molecules. In addition, the scalability allowed by plants exceeds that of other production systems. However, expansion of molecular farming is strongly restricted by European legislation, as standard transgenic genetic modification technologies transfer foreign DNA in the target genome.

The novel DNA methylation system allows the targeted generation of economic plants with a modified phenotype by gene silencing, whereas the transgene does not remain in the progeny of the formerly transformed plant. Furthermore, the requested phenotypic characteristics are being transferred to the plant’s descendant over several generations. This is achieved by so called RNA-directed DNA methylation (RdDM) which allows modifying the methylation pattern of genomic sequence specifically.

The innovation of this technology is based on the insertion of a transgene consisting of an

"inverted repeat" (IR) construct within an intronic sequence, whereas the IR construct comprises sequences of the target gene. While transcription of the RdDM construct, double stranded RNA (dsRNA) is being formed, which remains - different from conventional RNAi methods - in the nucleus, where it leads to de novo methylation of the target gene's promoter. This results in a specific transcriptional inactivation of the promoter sequence and therewith in silencing of the target gene.

By epigenetic heredity, the RdDM-driven methylation pattern is transferred to the plant's next generation. As a result, the target gene remains inactivated, while the transgene is removed by outbreeding. All in all, the RdDM method enables the generation of transgene-free plants which have a modified gene expression pattern.

The research organisation is interested in exploiting its know-how technically and econommically and further developing the described technology. Various kinds of international cooperation are possible.

Partners are welcome, who are active in the development of new pharmaceutics and compounds, such as proteins, vaccines or small molecules and other industrial bioproducts. Out-licensing of the technology is possible.

Plant breeders looking for new plant breeding technologies may be interested in applying the proposed technology, e.g. within a technical cooperation or joined further development.

The research organisation is also very interested in finding partners preparing a project proposal in response to relevant forthcoming HORIZON 2020 calls. (e.g. Leadership in Enabling and Industrial Technologies / Biotechnology).

The above mentioned kinds of cooperation are examples. The research organisation is open to discuss further opportunies.

Advantages and Innovations

1)
Contrary to e.g. classic mutagenese methods, this epigenetic methylation system allows targeted modification of economic plants’ characteristics and avoids undesired genome changes.

2)
Efficiency of methylation is considerably higher compared to conventional technologies.

3)
No vertical or horizontal gene transfer as in common molecular engineering technologies. Therefore it is less restricted by European legislation, while the requested phenotypic characteristics are being transferred to the plant’s descendants with high stability.

Stage of Development

Available for demonstration

IPR Status

Patents granted

Comment Regarding IPR status

PCT granted

Profile Origin

Other

Keywords

Technology

06002005	Genetic Engineering
06002009	Molecular design
06003001	Bioinformatics
06003002	Gene Expression, Proteome Research
07001004	Crop Production

Market

04001001	Agricultural genetic engineering applications
04001002	Industrial genetic engineering applications
04001003	Medical genetic engineering applications
04001004	Other recombinant DNA
05008002	Food and feed ingredients

NACE

A.01.2.1	Growing of grapes
A.01.2.4	Growing of pome fruits and stone fruits
A.01.2.8	Growing of spices, aromatic, drug and pharmaceutical crops
A.01.3.0	Plant propagation
M.72.1.1	Research and experimental development on biotechnology

Open for EOI : Yes

Dissemination

Send to Sector Group

Bio Chem Tech

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

1996

Turnover

1 - 10M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
German
French

Client Country

Germany

Partner Sought

Type and Role of Partner Sought

Ideal industrial or academic partners should be:

- active in the development of new pharmaceutics and compounds, such as proteins, vaccines or small molecules

- aiming to exploit minor, underutilized and non-food crops suitable for the extraction of bioactive compounds

- aiming to improve crops to grow more efficiently and have higher yields of the target bio-product, while being more tolerant to adverse environmental conditions

- The partner should be interested in applying the proposed technology and/ or jointly adapt it to further pupose

Type and Size of Partner Sought

SME 11-50,University,R&D Institution,SME <10,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

License agreement
Technical cooperation agreement
Research cooperation agreement

Attachments

Gene silencing of a tobacco plant's phytoene desaturase gene.jpg

