

Jornada Informativa en Bioeconomía. Retos Colaboración 2016

*Novel Multifunctional Nanoplatfom as Theranostic
Technology for the Alzheimer Disease.*

NANOTHERAD



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Cooperación Interplataformas

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PROPOSAL: LAB ON A CHIP

Diagnosis

Subcutaneous lab on a chip, to detect miRNA in asymptomatic patients of risk groups (documented) as early diagnosis, as well as in suspected patients, with definitive diagnosis (also documented). The novelty of this approach lies in the early detection of the miRNA107 (a very well known biomarker), for definitive diagnosis in vivo in real time, With this method, isotopic labelling or amplification of the sample, are not required.⁶ Besides, the sensitivity of the cantilever, of an order of fM, is very high.

Rationale: *The specific role of miRNA 107 as biomarker, as well as its inability for effective control of BACE1 enzyme, genes, etc., are known as a clear sign of injury in early-stages of A.D.⁶*

Treatment

Controlled release of mesoporous silicon nanoparticles loaded with recombinants of nucleic acids and enzymes, as therapeutic agents by nasal aspiration.

The novelty of this approach represent the most direct method to transport drugs to the CNS,^{7,8} (noninvasive alternative). This route will bypass the blood-brain barrier and will limit the systemic side effects, using natural therapy.

MAIN OBJECTIVES

- 1.- Development of advanced technological solutions for in vivo diagnosis: biosensor for nucleic acid detection.*
- 2.- Development of Smart molecular drug delivery system for targeted and effective pharmacological therapy.*
- 3.- Development a specific ICT infrastructure for the direct transmission of clinical data biosensors and drug delivery systems to the electronics health record*

- Early diagnosis, at least 20 years before symptoms are detected.*
- Definitive diagnosis (confirms or discard presumptive clinical diagnosis).*
- Real-time detection in vivo of biomarker indicating brain damage in AD, at the beginning of neurodegeneration.*
- Minimum sample quantities are required.*
- High sensitivity fM and high specificity.*
- No isotopic labelling, or amplification of the sample are required.*
- Minimally Invasive, only an incision to implant the sensor.*

Social Contribution

- Effective treatment.*
- Allows restore cellular and molecular physiology in situ, as one of the first signs of injury that could eventually lead to neurodegeneration, through natural molecules such as enzymes and nucleic acids.*
- Intranasal administration, offers an alternative, noninvasive means of drug delivery to the brain because nanoparticles delivered by this way can bypass the BBB and directly transport drugs to the CNS.*
- Identifies epigenetic factors involved, allowing acting on them.*

Promoter

GECOTEND Ltd. is a scientific research group leaded by PhD. Maria del Carmen Dona (Cuba), composed of several professionals, whose main objective is the knowledge and technology management of neurodegenerative diseases such as Alzheimer, Parkinson, Huntington, Amyotrophic Lateral Sclerosis (ALS) and Multiple Sclerosis, (MS) working to develop theranostic technologies (combination of diagnostic and therapy) to solve all these disorders.

Two patents have been applied for; one for early diagnosis by way of the Elisa test and the second, a natural treatment of Alzheimer's dementia type using Huperzine A.

GECOTEND Ltd also offers coaching services for geriatricians and gerontologists as well as for caregivers of patients with dementia.

PARTNERS



POLITÉCNICA

MEMBERS

Ing. Marisa López-Vallejo
Ing. Pablo Iturero

TASKS

Data gathering,
generation, evaluation
standardization and
validation

OBJECTIVES

Develop innovative
biosensor to detect nucleic
Acid. (miRNA) as
biomarker in AD
diagnostic
Static piezoelectric
Nanocantilever.



MEMBERS

Dr. Antonio Cuadrado IDIPAZ

TASKS

Recruitment
Creation of study groups
Laboratory exams
Surgical implant biosensor
Detecting positive
Providing treatment to positive
patients
Data base.

OBJECTIVES

Clinical study for biosensor
technology investigate and Drug
Delivery Tecnology



TASKS

Nano Spray Dryer Technology

Manufacturing of NanoSpray
Dried with nanocapsules
containing nucleic acid and
Thioredoxin in particles of
respirable size in a high yield.



Potential partners

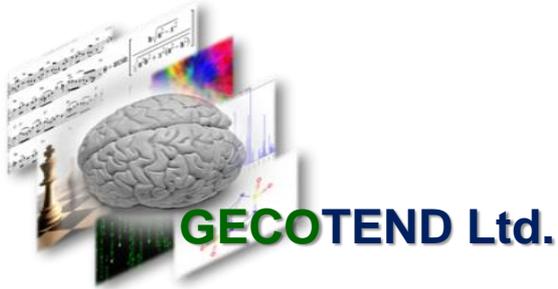


TASKS

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CONTACTO

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