Technology proposal 1

Currently in PoC program: device under development
Italian and PCT patent applications filed.
A similar technology is available for Irinotecan

CHEMOTHERAPY: IMATINIB DRUG MONITORING

PRIORITY NUMBER:

102019000008808

KEYWORDS:

Imatinib
Anti-cancer drugs
Therapeutic drug monitoring
Point-of-care

The effectiveness of many anticancer drugs varies greatly from patient to patient, with risks of incorrect dosages and adverse side effects. The invention provides for the first time an electrochemical method to measure the concentration of the drug Imatinib in patient's plasma and then to establish the optimal dose, with an on-site test readable in real time.

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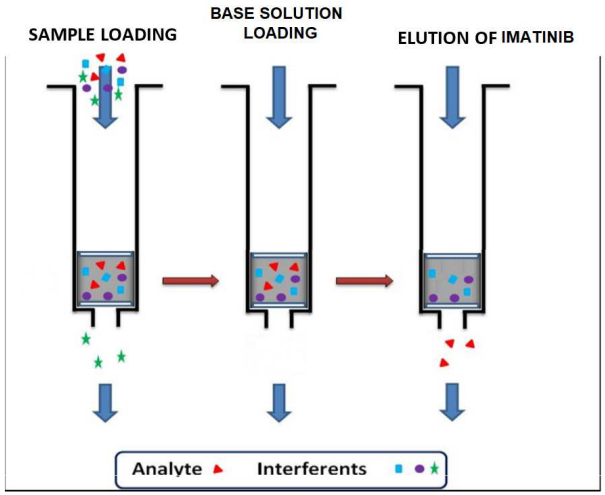
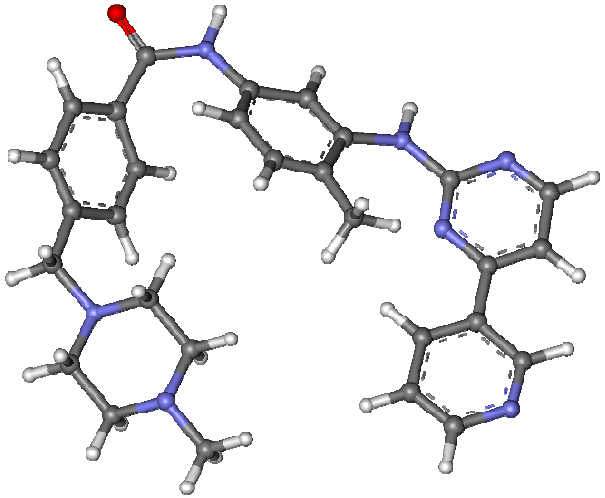


DESCRIPTION:

CHEMOTHERAPY: IMATINIB DRUG MONITORING

Imatinib is an anticancer drug used in particular for the treatment of Philadelphia chromosome-positive acute lymphoblastic leukemia. The therapeutic drug monitoring (TDM) greatly improves the effectiveness of the cancer treatment and helps to personalize the doses and to limit side effects. Quick procedures are therefore essential. The patented electrochemical method provides a simple, fast and cost-effective protocol for the measurement of Imatinib concentration through plasma collection; said method is suitable for the manufacturing of a device, that will make the test results readily and easily accessible at the patient's bed (point-of-care), avoiding long times required by specialized analysis. The method involves the selective extraction of the drug on a liquid-liquid extraction column and a following measurement of its concentration using an electrochemical technique, in particular adsorptive stripping voltammetry.



ADVANTAGES:

- Simple protocol to be performed also by non-specialized personnel;
- Rapid and accurate diagnosis on site;
- Minimum amount of plasma required;
- Results in real time;
- Determination of drug concentration and therefore of treatment effectiveness for a timely adjustment of individual dosage.

APPLICATIONS:

- Protocol to determine Imatinib concentration in patients' plasma;
- Suitable for developing a portable device to perform therapeutic Imatinib drug monitoring.

Technology proposal 2

Patent application filed in December 2020

Therapeutic agent delivery system based on Adipose Stromal/Stem Cells

Patent application n° 102020000030692 (14.12.2020)

Technology overview

Efficient targeted delivery system of therapeutic molecules (e.g. cytotoxic agents) based on ex-vivo expanded Adipose Stromal/Stem cells (ASCs).
The procedure to culture ASCs is compatible with Good Manufacturing Practice guidelines and it enables transient or stable genetic modification of ASCs by a non-viral method for clinical applications.

Applications

- **Cell therapy**: ASCs can be used both as autologous and as allogenic cell therapy product
  - **Oncology**: targeted delivery of cytotoxic agents
  - **Regenerative medicine**: delivery of trophic factors

ASC General Advantages

- Lower side effects compared to other approaches such as chemotherapy, radiotherapy and surgery
- Low immunogenic response
- Can be used both as autologous and as allogenic cell therapy product

Additional Advantages

- Rapid cell expansion rate
- Improved homing ability on cancer cells
- Improved efficiency of cell transfection
- Stable release kinetic of the therapeutic molecules

Technology proposal 2

Patent application filed in December 2020

The team and field of expertise:

Doctor Francesco Agostini is the research leader, he is experienced in production process design, quality control, and translation to the preclinical and clinical setting.

Doctor Mario Mazzucato is the director of the Stem cell unit at CRO-Aviano: such facility is in charge of collection, storage and manipulation of $CD34^+$ cells for autologous hematopoietic stem cell transplantation (JACIE accreditation). He is experienced in collaborating with companies and he is member of the scientific board of SediciDodici, a spin-off of CRO-Aviano developing an instrument to analyze blood coagulation.

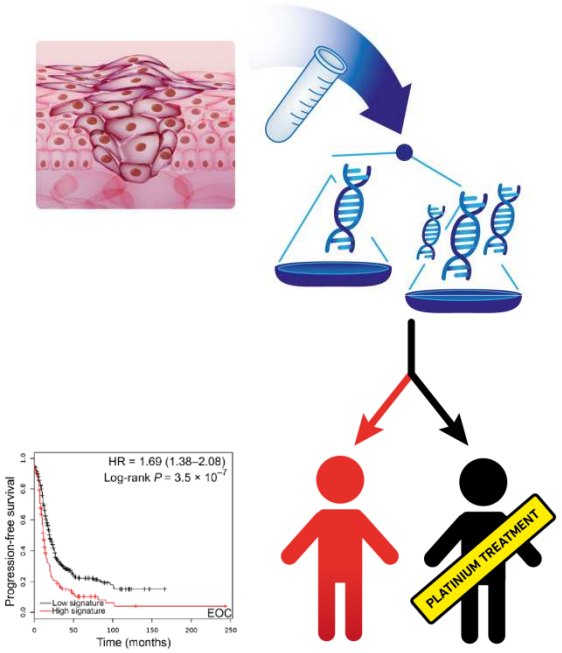
We are looking for partners to perform in vivo studies (murine models) and customize the technology with a selected cytotoxic agent against a specific tumor.

Further Reading: Agostini et al., J Transl Med. (2017) doi: 10.1186/s12967-017-1210-z; Agostini et al., PLoS One. (2018) doi: 10.1371/journal.pone.0203048; Agostini et al., Stem Cell Res Ther. (2018) doi: 10.1186/s13287-018-0886-1; Agostini et al., Ann Transl Med (2020) doi: 10.21037/atm.2020.04.25.

Technology proposal 3

Currently in PoC program Biovaria 2021

PREDICTIVE KIT FOR PLATINUM THERAPY



The invention consists in quantifying the expression of 10 genes from tumor cells to detect patients eligible for platinum treatment at higher risk of developing drug resistance and disease progression. Drugs such as cisplatin, oxaliplatin and carboplatin are used to treat various types of worldwide common cancer, but resistance is a frequent event. Patient stratification based on tumor gene expression profile allows to personalize treatment reducing side effects and costs.

PRIORITY NUMBER:

102019000000130

KEYWORDS:

Predictive analysis
Platinum Chemotherapy
Gene Expression
DNA - mRNA
Personalized medicine

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Technology proposal 3

Currently in PoC program Biovaria 2021

Formulation	Cancer type
cisplatin	Testicular cancer, ovarian cancer, bladder cancer, head and neck cancer, NSCLC, SCLC, gastric cancer, anal cancer
carboplatin	Ovarian cancer, NSCLC, SCLC, melanoma, head and neck cancer, thymic cancer, breast cancer
oxaliplatin	Colorectal cancer

- X. Kang, et al. Cancer Biol. Med. 12, 362–374 (2015) DOI: 10.7497/j.issn.2095-3941.2015.0063

Cancer type	Estimated new cases/year in the USA
breast	268600
colorectal	145600
bladder	80470
ovarian cancer	22500

- https://www.cancer.gov/types/common-cancers
- G. C. Jayson, et al., Ovarian cancer. Lancet 384, 1376–1388 (2014) DOI: 10.1016/S0140-6736(13)62146-7

DESCRIPTION:

PREDICTIVE KIT FOR PLATINUM THERAPY

Inventors observed a correlation between the expression of 10 genes in tumor cells of patients eligible for platinum treatment and the risk of developing drug resistance and disease progression.

"Platinum agents comprise…in 80% of clinical anticancer regimens as a single agent or combined with other anticancer drugs." (DOI: 10.7497/j.issn.2095-3941.2015.0063) "Unfortunately, the development of platinum-resistant tumor recurrences represents a very frequent event." (DOI: 10.1126/sciadv.aav3235) Moreover costs of platinum-free treatment can be lower than platinum based treatment. (DOI: 10.1200/JOP.2015.006700)

In this context, having the possibility to identify patients who will most benefit from drug specific treatment is economically and clinically relevant.

ADVANTAGES:

- Gene expression quantification can be performed with high throughput, widespread techniques
- Applicability in different tumor types treatable with platinum
- Reduction of treatment costs
- Improvement of patients life quality by avoiding ineffective treatment and potentially serious, useless side effects

APPLICATIONS:

- Disease: Epithelial Ovarian Cancer, Triple Negative Breast Cancer and potentially applicable to other cancer treatable with platinum
- Sample: mRNA extracted from cancer cells
- Technology: any technique to quantify nucleic acids

Technology proposal 4

App Prototyping is ongoing in collaboration with an IT company. We are looking for investors interested in supporting the App development.

COGNITIVE FUNCTION SELF-ASSESSMENT TOOL

Technology Overview

Novel tool for the evaluation of cognitive impairment that interfere with optimum quality of life:
18 items questionnaire with score correlated to clinical outcome and indications.

Cognitive Function refers to intellectual processes and all aspects of perception, thinking, reasoning, and remembering that are key in maintaining personal and social independence, working capability, and associated quality of life.

Technology Application

In cancer patients surgical treatment of Central Nervous System tumors, as well as radiotherapy, chemotherapy, and hormone-therapy, could induce transitory or long-term cognitive impairment due to damaged encephalic tissues or blood-vessels.
The tool can be applied for other non-neurological populations.

Development Stage

The tool is ready to use and well known around the world.
It was validated in cancer patients 1 to 3 years after diagnosis, and 5 progression free years after the end of treatment.

Technology proposal 5 Patent application under filing

HPLC device for high-volume samples analysis

Technology Overview

Fluidic device that allows **high sample volume** injection in HPLC systems and provides an automated purification step, reducing sensitivity problems and facilitating the analysis of extracted compounds from **complex matrix**.

Technology Application

- Therapeutic drug monitoring and forensic medicine
- Environmental analysis e.g. pollutants in air, water, soil
- Food quality evaluation

Developmental Stage

A LC-MS/MS method based on this fluidic device has been validated in the laboratory and is currently used for therapeutic drug monitoring (Imatinib and Norimatinib) of cancer patients. Miniaturization and automation are required for commercial use. Patent opportunities are currently under evaluation.

Technology proposal 6 Available for licensing

Centro di Riferimento Oncologico
Scientific Direction – Technology Transfer Office

REGIONE AUTONOMA FRIULI VENEZIA GIULIA
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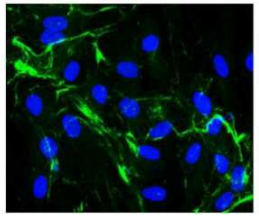
CRO di Aviano - Istituto Nazionale Tumori



Sector: Research
Ownership: 100% CRO Aviano (IT).
Inventors: Mucignat M.T., Doliana R., Spessotto P., Mongiat M., Colombatti A.
Creation date: May 1999
Publication Update: July 2017
Availability for non-exclusive licensing
Contacts: Technology Transfer Office of CRO Aviano
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Anti-human Emilin-1 (#1H2G8)

-Description-

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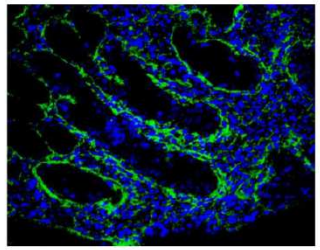

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Anti-human Emilin-2 (#828B3B3)

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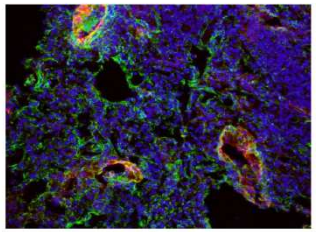

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Anti-mouse Emilin-1 (#1007C11A8)

Licenses of monoclonal antibodies