

HEADQUARTERS:
R.G.C.C. Ltd.
Dr. Ioannis Papanotriou
115 M. Alexandrou Str.
GR – 53070, Filotas, Greece
Tel: 0030-24630-42264 or 0030-24630-41845
Fax: 0030-24630-42265
Site: www.rgcc-genlab.com
e-mail: office@rgcc-genlab.com

BRANCH OFFICE IN UNITED KINGDOM (UK):
R.G.C.C. - UK Ltd
Litfield House Medical Centre
Dr. Nicola Hemby
Clifton, Bristol
BS8 3LS, England
Tel: 0044-117-317-1460
Fax: 0044-117-973-3303
e-mail: info@drhemby.com or rgcc-uk@rgcc-genlab.com

BRANCH OFFICE IN U.S.A. - CANADA - NORTH & CENTRAL AMERICA
R.G.C.C. - USA, LLC
6822 22nd AVENUE NORTH #332
ST. PETERSBURG, FL, US 33710
Tel: 001 - 727-345-2050
Fax: 001-972-463-8243
Site: www.rgccusa.com
e-mail: info@rgccusa.com

REPRESENTATIVE IN GERMANY - AUSTRIA:
Dr. Ursula Jacob GmbH
Silberwaldestr 34
72280, Dornstetten OT
Hallwangen, Germany
Tel: 0049-744-3964-240
Fax: 0049-744-3964-2499
e-mail: klinik@ursula-jacob.de

REPRESENTATIVE IN AUSTRALIA – NEW ZELAND – EAST ASIA:
GENOSTICS PTY Ltd.
Dr. Joachim Fluhrer
1b Paradise Avenue
Clareville, Australia
P.O. NSW 2107
Tel/Fax: 0061-299-733-646
e-mail: joachim@doctorfluhrer.com.au

Research Genetic Cancer Centre Ltd.

THE CANCER STEM CELL'S HYPOTHESIS
Are they the key in cancer spread?

R.G.C.C. Ltd
RESEARCH GENETIC CANCER CENTRE Ltd
115 M. Alexandrou Str.
53070 – Filotas
GREECE

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WHO IS RGCC LTD?

R.G.C.C. Ltd is a pioneer CRO company which is activated specially in the field of molecular oncology and cancer genetics. Having high quality laboratory equipment and specialized personnel, R.G.C.C. Ltd can offer precise and standard research services to pharmaceutical industries and organizations. Including all the above, R.G.C.C. Ltd also specializes in the field of cancer stem cell-like cells (CSCs).

IMPORTANCE OF CSCs IN CANCER PROGRESS:

The population of circulating tumor cells (CTCs) includes a sub-population of cells - (CSCs) - which has been proved to be the reference point in the development of cancer through metastases and relapses. The key to improve cancer treatment is to understand the mechanism of how CSCs escape chemotherapy and become resistant to drugs. R.G.C.C. Ltd has developed methods – cellular and molecular ones – in order to identify the presence of CSCs in the primary tumor as well as in CTCs.

c. GENE'S EXPRESSION ANALYSIS ASSAY

It is well established that CSC phenotype is defined by several molecular markers such as nanog, oct4, nestin, sox2, CD34. By using end-point and real-time PCR protocols, we have the ability to prove that a small population of circulating tumor cells has hallmarks of CSCs. Nanog is a relevant gene which regulates the asymmetric mitosis in stem cells and preserve stemness in cells.

Nanog's gene expression, a molecular marker of CSCs, in seven breast cancer stem cell-like cell lines. All samples were tested in doublets.

d. PROTEIN'S EXPRESSION ANALYSIS ASSAY

In this assay we use the flow cytometry in order to evaluate the expression of nanog's protein in relevance with the gene's expression assay above with the use of high quality software and specialized equipment. A murine anti-human antibody conjugated with FITC (Fluorescein isothiocyanate) has been used in order to evaluate the cells that express Nanog protein.

This figure represents the percentage of breast cancer cells that were cultivated with RPMI-1640 medium and express Nanog protein (1.24%).

This figure represents the percentage of breast cancer cells that were cultivated with a medium appropriate for cancer stem cell's growth (4.79%).

WHAT WE ARE ABLE TO DO:

R.G.C.C. Ltd with the highly equipped laboratory and trained personnel in combination with the innovative assays that have been set up in its facilities can provide services around identification, isolation and extensive studies and research in this new entity of cancer stem cells.

CSC's DETECTION AND QUANTIFICATION THROUGH RGCC's ASSAYS:

a. CSC's CULTIVATION ASSAY
Once circulating tumor cells are isolated, they are expanded in culture flasks in an appropriate growth medium which contains growth factors and ingredients essential for CSC's growth, expansion and proliferation.

Culture flasks

b. SPHERE - FORMATION ASSAY
The first method that is used in order to characterize a cell population as CSC population is a cellular-based one. Under high power light microscope, spherical colonies can be identified in to semi-suspension. CSC, utilizes this formation in order to evade cell death and attack to the immune system.

Prostate Cancer Stem Cell-like cell line Breast Cancer Stem Cell-like cell line

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Correlation between Cancer Stem Cells and Circulating Tumor Cells and Their Value
Maria Toloudi, Panagiotis Apostolou, Marina Chatziioannou, Ioannis Papanotriou
Research Genetic Cancer Center (R.G.C.C. LTD.), Filotas, Greece
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