Biomarker-based determination of response to therapy in lung and ovarian cancer

Method based on the quantification of a specific biomarker for determining the response to a platinum (or derivatives) treatment in a patient suffering from non small-cell lung cancer (NSCLC) or ovarian cancer.

Description and essential characteristics

Method for determining the response to an antitumoral compound based on platinum, specifically cisplatin, in a patient suffering from lung or ovarian cancer, comprising:

(i) determining the methylation level in the cytosine-phosphate-guanine (CpG) island of a gene codifying for a specific microRNA (miRNA) or the expression level of that miRNA in a sample of that patient, and

(ii) comparing the methylation level in that CpG island of the gene codifying for that particular miRNA or the expression level of that miRNA with the corresponding reference value.

An increase in the methylation level obtained in (i) or a reduction in the expression level obtained in (ii) compared to the corresponding reference value, enables the early detection -in the case of lung cancer- and indicates that the patient is resistant to that platinum compound -in the case of ovarian cancer.

The miRNA methylation assessment in 75 samples of human lung cancer patients indicates that methylation of this miRNA may be a frequent event in lung cancer patients (53% of the affected individuals); and could have prognostic value in terms of future development of lung cancer as it also appears in samples from patients with non-malignant diseases (emphysema).

The miRNA methylation assessment in 130 samples of human ovarian cancer indicates that this miRNA methylation is present in 29% of affected women, but however is related to worse response to platinum derivatives-treatment and less time to tumour progression. Data indicate that 50% of patients with methylated miRNA receiving platinum-based therapy relapse before 18 months. Moreover, 75.5% of women without disease recurrence, has unmethylated miRNA. Furthermore, overall survival in women with absence of methylation in this biomarker is 40 months longer than the group of patients with methylated miRNA (> 3 years). Those results have been confirmed in a later cohort of 29 samples, showing also an increase in methylation (from 29 to 56%) in both refractory and resistant patients, and also in high grade tumors.

Competitive advantages

At present there is no method to select those patients with ovarian cancer who will develop resistance to standard platinum treatment and that are most likely to relapse nor is there the possibility of early detection of lung cancer in individuals with emphysema.

This new method allows the early detection of NSCLC and the identification of ovarian cancer patients with worse response rate to platinum or its derivatives.

In the case of ovarian cancer patients, this would imply closer monitoring of a selected group of patients with increased probability of tumour recurrence, including its early detection and the selection with more specific treatment regimens.

Type of collaboration sought

Cooperation is sought with any Party interested in partnering, licensing or investing in the technology, whether it be an investor to fund the project, a partner interested in getting involved in any of the various phases until its placement on the market, a patent licensee, etc. Organisations potentially interested in this technology are those devoted to the manufacture, commercialisation and/or distribution of kits with disease diagnosis, prognosis and predictive value; as well as universities, hospitals, research centres and all types of institutions engaged in cancer diagnosis and treatment research.

Current stage of development

In vitro studies on 75 human lung cancer samples and 159 human ovarian cancer samples were carried out with promising results.

Current state of intellectual property

Spanish patent P201530997, granted in October 2017.
International patent application PCT/ES2016/070516.

For further information, please contact

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