BIOMARKERS FOR NON-INVASIVE DETECTION AND CLASSIFICATION OF PROSTATE CANCER

Three new biomarkers for the prognosis, stratification and cancer monitoring have been identified: PCA3, MRC2, and S100A4. These biomarkers could be detected by non-invasive methods, such as liquid biopsy, and be used as a component for kits and devices with the same purpose.

Technology for Licensing

Keywords:

Genetic biomarkers, prostate cancer, liquid biopsy, prognosis, stratification, diagnosis, S1004A, PCA3, MRC2.

Description:

Prostate cancer is one of the most common death causes worldwide, and one of the most frequently diagnosed tumours in males in Spain. In spite of that, diagnosis tools for their detection are lacking and there are no adequate genetic biomarkers: nowadays, PSA is the most common biomarker, despite the high percentage of false positives and false negatives.

Regarding treatment choice, there are no tools that can determine which treatment is the most effective for each patient. With it, the standard treatment is androgen deprivation therapy (ADT), which causes many hormone resistance cases. Despite existing a good initial response, after 18-24 months of ADT therapy, prostate cancer progresses to the castration resistant prostate cancer (CRPC) phase, which has 16 to 18 months survival rate.

To overcome that, three new genetic biomarkers PCA3, MRC2, and S100A4 have been identified. They can be used to detect, classify and/or prevent prostate cancer. PCA3 non-coding RNA is specific of prostatic tissue and is overexpressed early in prostate cancers; an overexpression of MRC2 indicates a higher extracellular matrix remodelling rate, which will ease further metastasis; and S1004A gene is overexpressed when cancer is more aggressive and metastasis has already started.

In addition, the detection of these biomarkers can be performed using non-invasive methods, such as liquid biopsy, and would be ideal for the development of kits and devices for the prevention, diagnosis and stratification of prostate cancer.

Advantages and Benefits

» Tissue and cancer specificity: PCA3 is expressed only in prostatic tissue, overcoming the main disadvantage of PSA.

» High accuracy and early detection. PCA3 is overexpressed in more than 95% primary prostate cancers.

» Custom medicine. Expression levels of PCA3, MRC2 and S100A4 will allow to define the most adequate treatment.

» Non-invasive and real-time analysis. Biomarkers can be detected with non-invasive methods, such as liquid biopsy, which allows multiple analysis along tumor process.

» Simple method. A kit or device would ease data obtaining.
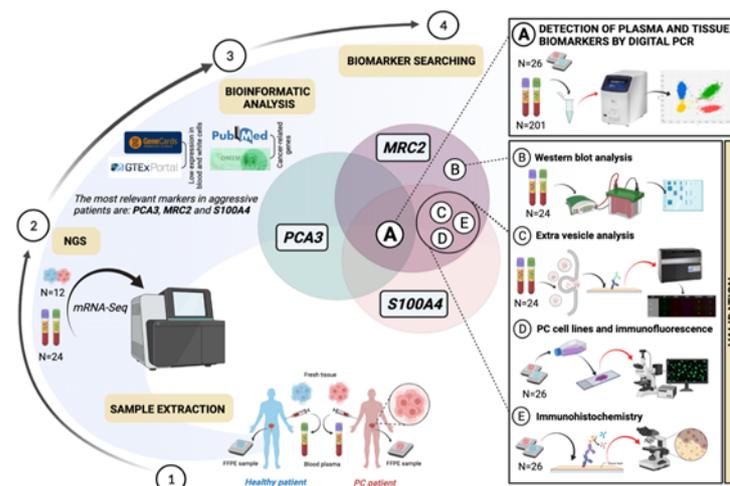
Steps from the extraction to the analysis and quantification of PCA3, MRC2 and S100A4

Patent status:
Spanish Patent application number: P202230187
Priority date: 08/03/2022

Contact:
Oficina de Transferencia de Resultados de Investigación (OTRI) - Universidad de Granada

patentes@ugr.es   www.otri.ugr.es