

TECHNOLOGY OFFERS

Mortality Prediction Through DNA Methylation Biomarkers (P-1333)

A method for predicting the chances of mortality independent of underlying diseases or biological

EXECUTIVE SUMMARY

Getting to know your chances of dying can be daunting but also can be rather useful and fascinating. The kit predicts all-cause mortality independent of underlying diseases and uses DNA methylation status of the ten CpG sites to predict mortality. The status has to be determined for at least two of the ten CpG sites compared to a reference value from the same CpG site. The deviation from the reference value can then be related to all-cause, cancer related or cardiovascular disease related mortality. The analysis can be performed on a blood sample, tissue sample or a sample of separated cells. The results may be used to recommend life style changes to the patients or support any decisions e.g. which further tests are needed.



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Category

Patient
monitoring

Indication

All-cause
mortality

Development stage

Feasibility

Seeking

Licensing

BENEFITS

- Just 10 CpG sites to predict the chances of mortality
- Method is independent of underlying diseases or biological health
- More accurate than any other current longevity predictors

TECHNOLOGY BACKGROUND

DNA methylation plays a role in various diseases. In addition, evidence has been accumulated that the recently established “epigenetic clock” based on age-associated DNA methylation changes is an indicator for longevity. Environmental factors as well as life style can have a crucial influence on DNA methylation. Smoking related DNA methylation change for example can be connected to lung cancer mortality. This invention uses DNA methylation status at CpG sites to predict disease related as well as all-cause mortality independent of underlying diseases or the ‘epigenetic clock’.

DEVELOPMENT STAGE

The method has been validated through a 14 years’ long study and through an independent cohort.

APPLICATIONS

It can be developed into a “ready to use” kit to perform the methods for patients or consumers interested in their genetic health. Testing methods for practitioners to support decision for further diagnostic tests or close monitoring.

INTELLECTUAL PROPERTY

Patent application submitted:

- An international PCT patent application “DNA methylation signatures for determining a survival probability” has been published as WO2018150042A1.

PUBLICATIONS & REFERENCES

- Yan Zhang, et al. “DNA methylation signatures in peripheral blood strongly predict all-cause mortality”. Nature Communications, 2017; 8: 14617 DOI: 10.1038/ncomms14617
- Yan Zhang, et al. “ Smoking-Associated DNA Methylation Biomarkers and Their Predictive Value for All-Cause and Cardiovascular Mortality”. Environmental Health Perspectives, 2016, <https://doi.org/10.1289/ehp.1409020>

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ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg