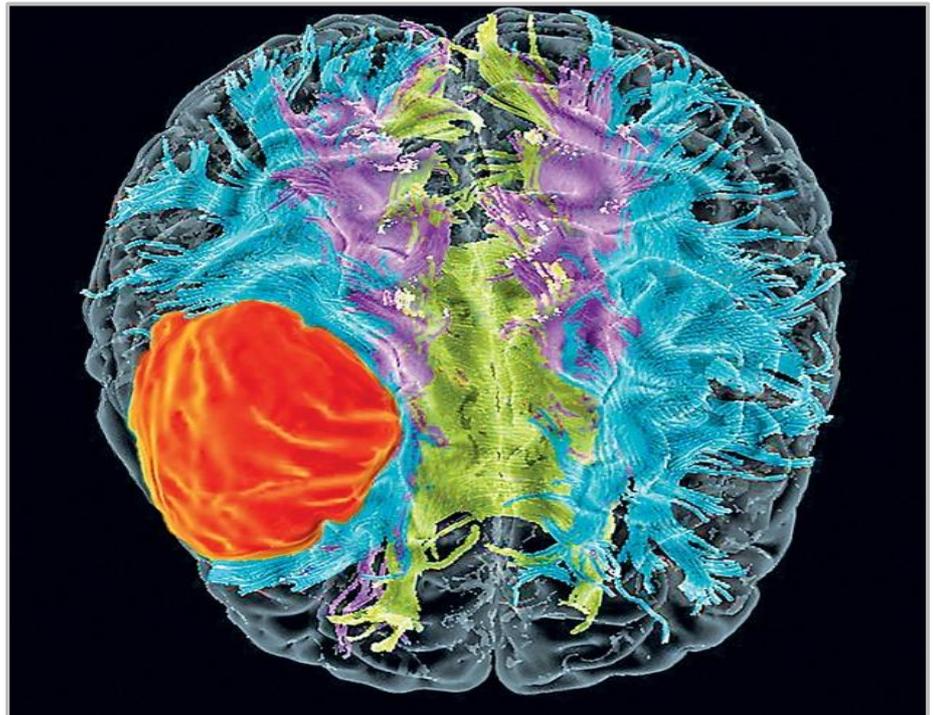


## TECHNOLOGY OFFERS

# Histone mutations as marker for Glioblastoma (P-1012)

### EXECUTIVE SUMMARY

DKFZ and McGill developed a companion diagnostic tool for brain cancer drug development which could subsequently be used in CLIA accredited laboratories. Brain tumours, such as the highly aggressive glioblastoma multiforme (GBM), are currently the leading cause of cancer-related mortality and morbidity in children. Current diagnosis of brain cancers involves MRI, PET and CT scans, angiographies, followed by biopsies performed either during the resection of the tumor or as a separate procedure via a burr hole. A blood-based test would provide a more economical, i.e. accessible and less invasive diagnostic tool. The GBM specific biomarker has been protected under a provisional patent application.



Credit: Zephyr/Science Source. See: <https://cen.acs.org/biological-chemistry/cancer/immunotherapy-tackle-glioblastoma/96/i43>

#### Category

Diagnostics

#### Indication

Brain cancer

#### Development stage

Proof of concept

#### Seeking

Licensing, Commercial partner

### BENEFITS

- An antibody-based test identifying both mutations in cells shed from a brain tumour is less expensive but more predictive than any PET, MRI or CT scan.
- An antibody-based test identifying both mutations in cells shed from a brain tumour is less invasive than a biopsy taken after surgery or burr hole intervention.
- Identification of a mutation histone might be a more direct test as it is the origin of multiple changes in the transcriptome and subsequent epigenetic effects.
- H3.3 adds to the diagnostic potential of IDH-1 tests in adult glioblastoma

## TECHNOLOGY BACKGROUND

Whole exome sequencing (WES) led to the identification of two mutations (K27M and G34R/V) in histone 3.3 as closely correlated to pediatric but not adult GBM and pediatric anaplastic astrocytoma. Sanger sequencing verified single nucleotide variants (SNV) on 48 well-characterized pediatric GBM samples containing more than 90% neoplastic tissue collected from patients aged between 3 and 20 years, including 6 patients for whom we had matched non-tumour (germline) DNA. Both mutations have been confirmed by an independent research group.

## DEVELOPMENT STAGE

DKFZ is looking for a partner to commercialize a diagnostic test initially for the field of basic or clinical research.

## APPLICATIONS

The identification of two H3.3 mutations allow the categorization of pediatric brain cancer patients into patients with grade IV pediatric GBM ( $P < 0.0001$ ) and grade III pediatric anaplastic astrocytoma ( $p < 0.0078$ ) and diffuse intrinsic diffuse intrinsic pontine gliomas. Occurrence of these mutations is linked to lower survival rate and help physicians in the clinical decision making process.

## INTELLECTUAL PROPERTY

Patent application has been submitted.

- Filed as WO2013075237A1.
- Nationalized as US9494591B2 (granted), EP2782928B1 (granted), CA2854255A1 (pending).

## PUBLICATIONS & REFERENCES

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### DKFZ Contact:

Dr. Karin Flieger  
Deutsches Krebsforschungszentrum  
Innovation Management, T010  
Email: [K.Flieger@dkfz-heidelberg.de](mailto:K.Flieger@dkfz-heidelberg.de)  
Tel.: +49-(0)6221-42-2946  
Fax: +49-(0)6221-42-2956

## 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