GERMAN CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

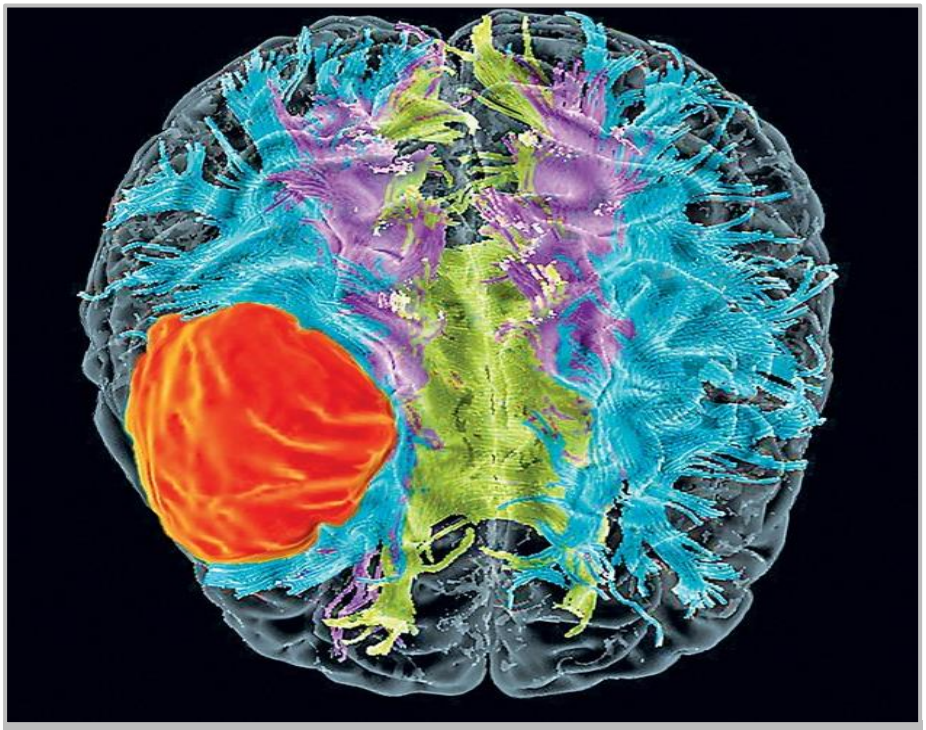
Research for a Life without Cancer

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 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 involve 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	Indication	Development stage	Seeking
Diagnostics	Brain cancer	Proof of concept	Licensing, Commercial partner

BENEFITS

- An antibody-based test identifying both mutations in cells shedded 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 shedded 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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