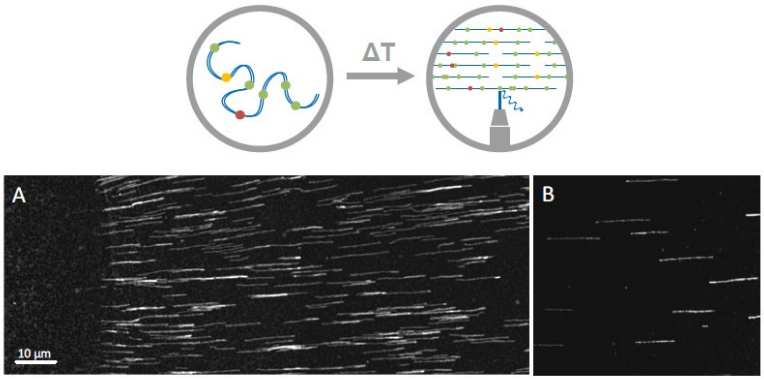
INNOVATION | RWTH AACHEN UNIVERSITY

RWTH Technology

Genome mapping of DNA stretched on hydro-gels



Challenge

DNA analysis including large structural variations (copy-number variations, deletions etc.) and methylation patterns (epigenetics) is becoming ever more important for early detection and differential disease diagnosis, especially in oncology, where this type of information can enable the choice of therapeutic strategies tailored to each patient's need. Using a simple yet sensitive and reliable optical analysis approach would offer clear advantages compared to prevailing biochemical analysis (short read sequencing approaches). In order to use fluorescence microscopy for such purposes (optical DNA mapping) a transformation of the entropically favored coiled conformation of the DNA to a linearized form needs to be achieved (DNA stretching).

Solution

Researchers at RWTH Aachen have developed a proprietary technology of stretching DNA on hydrogels ("hydrogel chips"), allowing for the optical analysis with standard fluorescence microscopes. This technology offers several advantages, not only compared to sequencing strategies but also in comparison to nanofluidic technologies and DNA combing based approaches.

Advantages

- Cost effective solution
- Available - fluorescence microscopes form part of the "standard" lab equipment
- Very flexible, can be adjusted depending on the question addressed

Status

- Patent application at the German Patent and Trade Mark Office. The patent application pending is not yet published in the Patent Gazette. Only after the first publication of the patent application, the applicant can derive rights therefrom and can especially claim compensation from third parties.
- Proof of concept, ongoing research

RWTH Aachen University is looking for partners for patent exploitation and for research partners for joint development.

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Fields of application
Diagnostics, Medical Research

Keywords
#DNA Stretching; #Epigenetics
#Hydrogels; #Structural variations

Your Contact person
Dr. Henrik Flötotto
Innovation Manager

Campus-Boulevard 79
52074 Aachen
GERMANY

Phone: +49 241 80-96615
Fax: +49 241 80-692614

henrik.floetotto@
rwth-innovation.de

www.rwth-innovation.de