A 3D genomics platform for therapeutic target discovery and disease detection

Thera-GAM

MAX DELBRÜCK CENTER

› Genetic variation in non-coding regulatory regions accounts for up to 90% of heritability in neurological disorders
› These disorders often have missed diagnoses, as well as poor prognoses and treatment outcomes
› Current approaches fail to capture targets of these regulatory regions, missing key targets for treatment

Thera-GAM is a patented 3D genome mapping technology which captures disruptions in gene-regulatory networks to connect genetics with molecular mechanisms for disease detection and therapeutic target discovery

TECHNOLOGY

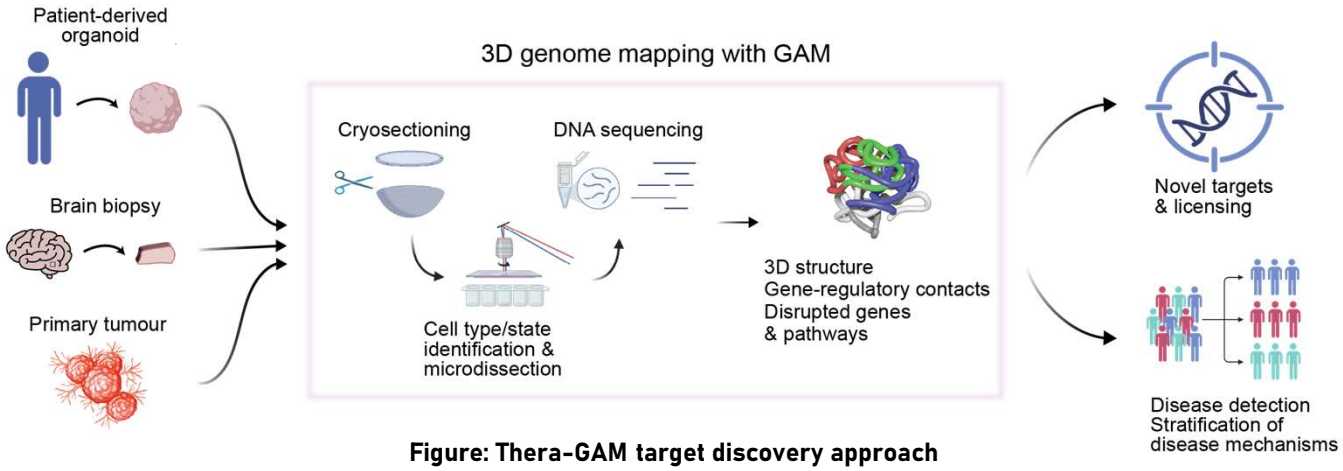

Figure: Thera-GAM target discovery approach

A versatile platform which maps gene-variant interactions for therapeutic target discovery

› Genome Architecture Mapping (GAM) profiles 3-dimensional genome structure in single cells directly from patient samples
› GAM captures spatial interactions between genomic variants and target genes in complex diseases (e.g. cancer, epilepsy, Alzheimer's)
› RNA-GAM extends the scope by measuring gene expression simultaneously with genome interactions enabling cell state discovery
› Highly scalable with all experimental steps automated, enabling rapid collection of large datasets at low cost

Development status

› TRL 3-4
› Proof of concepts in human epilepsy and glioma identified potential therapeutic targets
› Current proof of concept ongoing in neuroblastoma, together with validation partner

Applications

› Novel non-coding target discovery direct from patient-derived samples.
› Clinical profiling of key physical genomic interactions.
› Disease stratification for strategic drug-related decisions.

INTELLECTUAL PROPERTY

Genome architecture mapping ***WO2016092070A1***
National phases: EP (BE, CH, DE, DK, FR, GB, NL, SE) US, CA, CN, JP, IL (all granted)

Method for nucleic acid detection by oligo hybridization and PCR-based amplification ***WO2022084528A1***
National phases: EP, US, CA, CN, JP, IL

RESEARCH EXPERTISE

› Developed by the group of Prof. Dr. Ana Pombo, a world-renown leader in genomics and recipient of the 2025 Leibniz Prize
› Dr. Warren Winick-Ng is a co-developer and expert in the fields of genomics and neuroscience

PARTNER WITH US

We are seeking

› Co-development opportunities
› Industry partners

PROF. DR. ANA POMBO

DR. WARREN WINICK-NG

Winick-Ng et al. (2021) – Nature
doi.org/10.1038/s41586-021-04081-2
Yanchus et al. (2022) – Science
doi.org/10.1126/science.abj2890

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