Ivy Glioblastoma Atlas Project (GAP) Data
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https://ivygap.swedish.org/

http://glioblastoma.alleninstitute.org/
Goal: Provide online resources to scientists and physicians dedicated to the development of innovative treatments and diagnostics that will enhance the quality of life and survival of patients with brain cancer.

Includes two interactive databases linked together by de-identified tumor specimen numbers to facilitate comparisons across data modalities

In situ hybridization (ISH) and RNA sequencing (RNA-Seq) data, which map gene expression across the anatomic structures and putative cancer stem cell clusters in glioblastoma. The associated histological dataset is annotated and is suitable for neuropathological examination.

Detailed clinical, genomic, and expression array data sets that are designed to elucidate the pathways involved in glioblastoma development and progression. The hope is that researchers will mine these data and identify trends, correlations, and interesting leads for further studies with significant translational and clinical outcomes.

Fully-annotated anatomic transcriptional atlas
glioblastoma.alleninstitute.org
Allen Institute

Detailed clinical and genomic data
ivygap.org
Swedish Neuroscience Institute
Ivy Glioblastoma Atlas Project (Ivy GAP)

A. Clinical Data
   41 Patients
   Longitudinal Clinical Data Collection
   - Patient Information
   - Medications
   - Surgery
   - Chemotherapy
   - Radiation Therapy
   - Pathology
   - Radiology
   - Follow-up Clinical Visits
   - Clinical Trials
   - History

B. Tissue Prep
   42 Tumors
   - L Bars
   - Cryosectioning
   - Fresh Frozen

C. Two Studies
   - Anatomic Feature Based Profiling
   - ISH Survey
   - LMD/RNA Seq
   - ISH Validation
   - Genomic Analysis

D. Informatics
   - Machine Learning Predictions
   - Counting Nuclei
   - H&E-ISH Registration & Transfer
   - Ontology Development

E. Presentation
   - Specimen Search
   - ISH and H&E Sync'd Viewing
   - Transcriptome Heat Map
   - MGMT, SNPs, Fusions, Copy #
   - Clinical & Genomic Database
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- **ISH**: Image data at cellular resolution of *in situ* hybridization (ISH) tissue sections and adjacent hematoxylin and eosin (H&E)-stained sections annotated for anatomic structures.

- **Anatomic Structures ISH Survey**: Primary screen of 8 tumors with probes for 343 genes enriched in glioblastoma.

- **Anatomic Structures ISH for Enriched Genes**: Subsequent screen of 29 tumors with probes for 37 genes enriched in glioblastoma structures identified in Anatomic Structures RNA-Seq Study (see below).

- **Cancer Stem Cells ISH Survey**: Primary screen of 16 tumors with probes for 55 genes enriched in putative cancer stem cells, resulting in a 20 probe reference set, which was then used in an extensive screen of 42 tumors.

- **Cancer Stem Cells ISH for Enriched Genes**: Subsequent screen of 37 tumors with probes for 76 genes enriched in clusters of putative cancer stem cells identified in the Cancer Stem Cells RNA-Seq Study (see below).
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- **RNA-Seq**: RNA sequencing data for anatomic structures identified in the Anatomic Structures ISH Survey and putative cancer stem cell clusters isolated by laser microdissection.

- **Anatomic Structures RNA-Seq**: Screen of 5 structures (Leading Edge, Infiltrating Tumor, Cellular Tumor, Microvascular Proliferation, and Pseudopalisading Cells Around Necrosis) identified by H&E staining. A total of 122 RNA samples were generated from 10 tumors.

- **Cancer Stem Cells RNA-Seq**: Screen of 35 clusters of putative cancer stem cells identified by ISH with a 17 reference probe subset (validated in the Cancer Stem Cells ISH Survey). A total of 148 RNA samples were generated from 34 tumors.
Ivy GAP Clinical and Genomic Database

- Companion database for the Ivy GAP project
- Contains detailed clinical information including radiology and pathology images, genomic data, and prospectively collected outcomes data.

Clinical

| Initial Clinic Visit | Medications | Surgery | Chemotherapy | Radiation Therapy | Pathology | Radiology | Follow-up Clinic Visit | Clinical Trials | ISH | Needs Assessment | Experiments |

Genomic

| Query | Download | Fusions | WGCNA modules |

Reports

| MGMT | IVY | CLINICAL TRIAL | PATHOLOGY | EXPERIMENTS | MEDICATION REPORT |