GUDMAP

Genitourinary Development Molecular Anatomy Project

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About GUDMAP

The **GenitoUrinary Development Molecular Anatomy Project** (GUDMAP) is a consortium of laboratories working to provide the scientific and medical community with gene expression data, transgenic mice and tools to facilitate research.

The database contains over 10,600 in-situ entries covering in excess of 3600 genes, 2892 unique genes analysed by wholemount & 1419 by section ISH. It also contains 421 microarray samples. GUDMAP data are freely accessible via easy-to-use interfaces.

www.gudmap.org

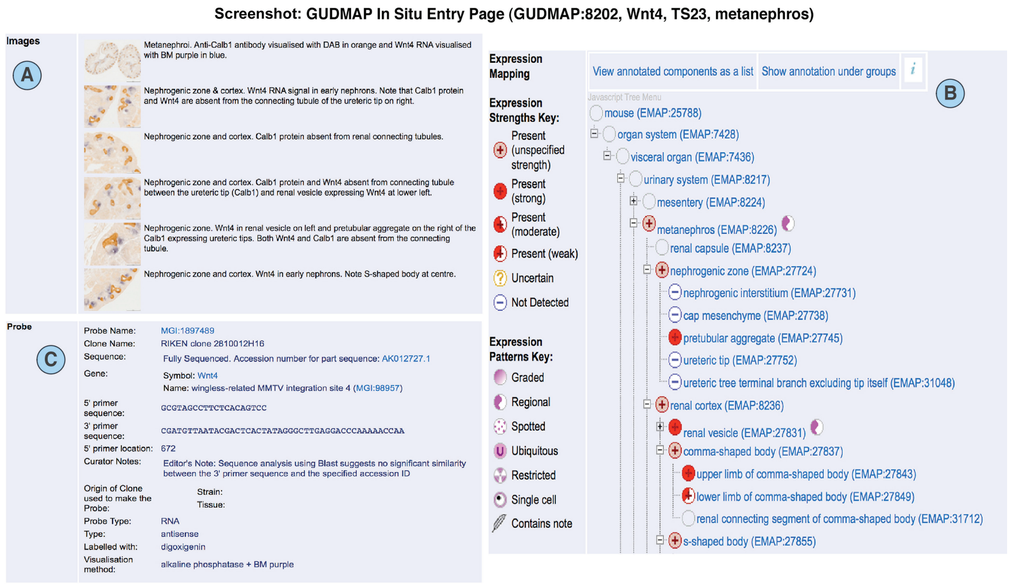
Gene Strips

GUDMAP data can be accessed via simple or advanced queries.

The gene strip links out to in-situ data & images, disease/phenotype associations and microarray expression data

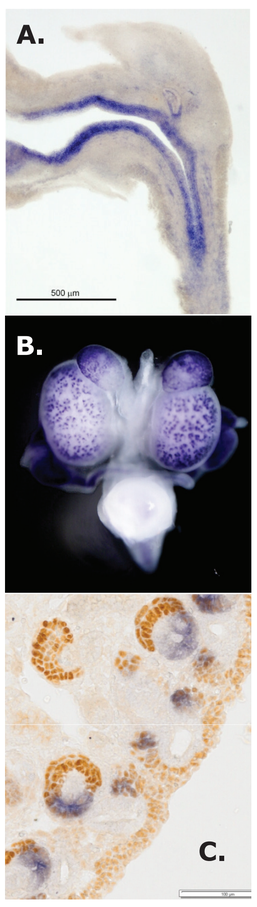
Gene	Synonyms	Disease	Theiler Stage	In situ expression profile	In situ expression images	Microarray expression profile	RNA-SEQ	Genesets
Upk3a	1110017C07Rik, Upk3	OMIM(1)	TS17-28				View on UCSC Browser	Genesets(n)
Wnt4	Wnt-4	OMIM(2)	TS17-28				View on UCSC Browser	Genesets(n)
Wt1	Wt-1, D630046I19Rik	OMIM(11)	TS17-28				View on UCSC Browser	Genesets(n)

In-Situ Data



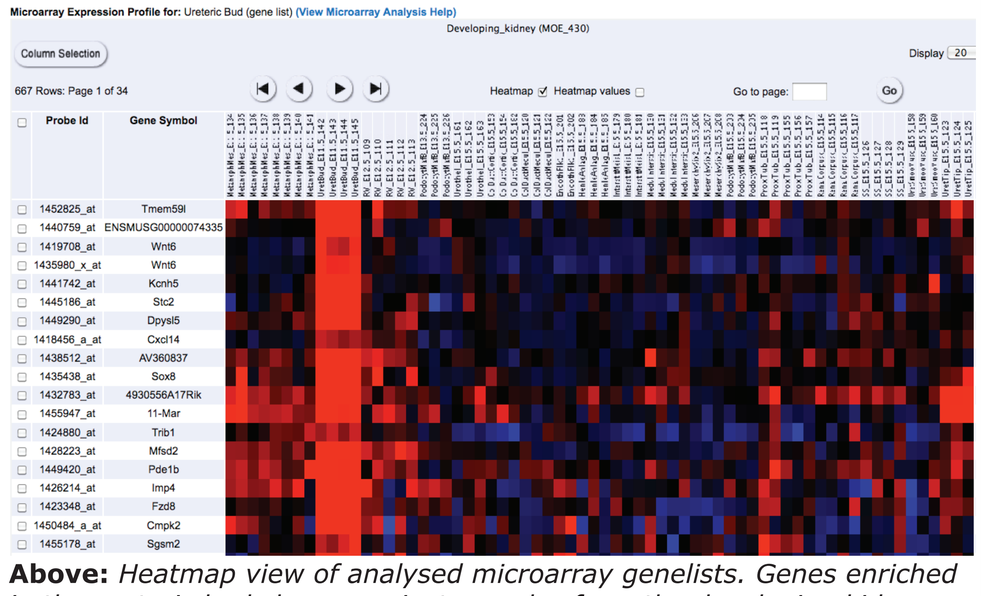
ABOVE: Main features of a GUDMAP In-Situ Entry.
A. Images. **B.** Annotation (user can select list or tree view).
C. Probe details.

The **high-resolution anatomy ontology (Little et al. 2007)** has been developed by the GUDMAP consortium to describe in detail the sub-compartments of the developing murine genitourinary tract.



A: (GUDMAP:14157) Ptk2 expression in the urethra of the male (TS25)
B: (GUDMAP:11296) Wnt4 RNA expression in the early nephron
C: (GUDMAP:8200; GUDMAP:8209) Metanephros double-stained for Wt1 protein (orange) and Wnt4 RNA (blue)

Microarray Data & Genelists



Above: *Heatmap view of analysed microarray genelists. Genes enriched in the ureteric bud shown against samples from the developing kidney*

Probesets for a gene are displayed on a single row, with each column representing an individual microarray sample. These are viewable over different samples sets for the GU system.

Current work will provide pre-analysed genelists - covering different sample sets and including clustered gene sets. These can be extended to enable comparison of genelists and the ability to perform on-the-fly analysis via ToppGene (CCHMC) (***http://toppgene.cchmc.org/***).

Tissue Summaries

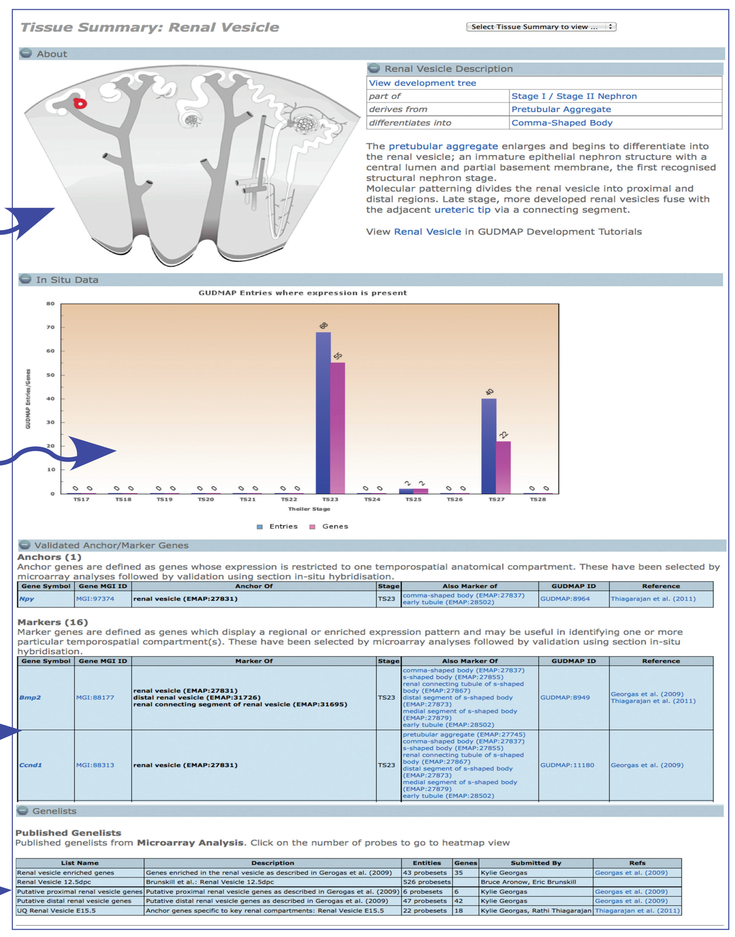
Data relating to a specific tissue of the GU system is summarised in these pages

Schematic diagrams, text descriptions and development diagrams (*far-right panels*) give details about the tissue

Graphical display of in-situ database entries and number of genes where expression is present in the tissue

Details of any known anchor or marker genes for the tissue

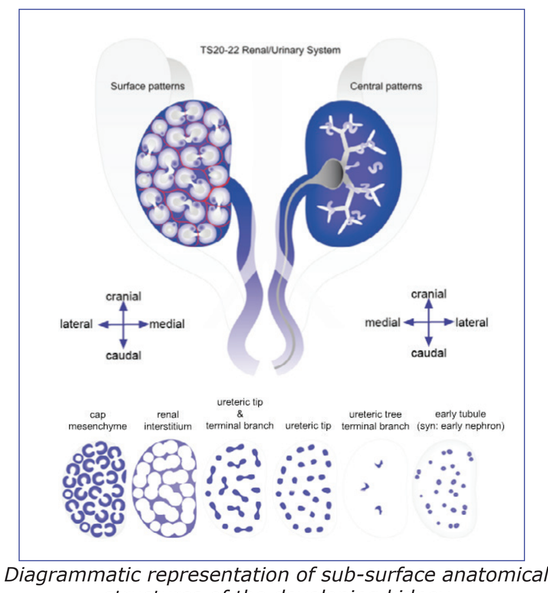
Analysed genelists associated with tissue



Tutorials on GU Development

The website provides **tutorials** describing GU organogenesis (Matt Kaufman)

These are supplemented with schematic diagrams that serve to illustrate the developing components of the mouse GU system over different stages (Kylie Georgas).



Diagrammatic representation of sub-surface anatomical structures of the developing kidney

Schematics to be integrated with in-situ data to help interpret and compare expression patterns.

Ongoing Developments

- New data types: OPT, RNA-SEQ
- Online submissions interface
- Improved search capabilities (SOLR index)
- Neuronal data including mapping neural connectivity
- Ontology expansion

References

Harding SD et al. (2011). The GUDMAP database - an online resource for genitourinary research. Development. 138(13):2845-53
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