GUDMAP
AN ONLINE GENITOURINARY RESOURCE

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Introduction

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

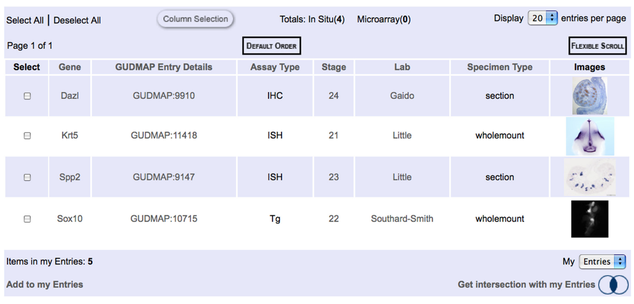
GUDMAP Gene Expression Data

The data provided by GUDMAP include large in situ screens and expression microarray analysis of components of the developing mouse urogenital system. These data can be summarized as follows:

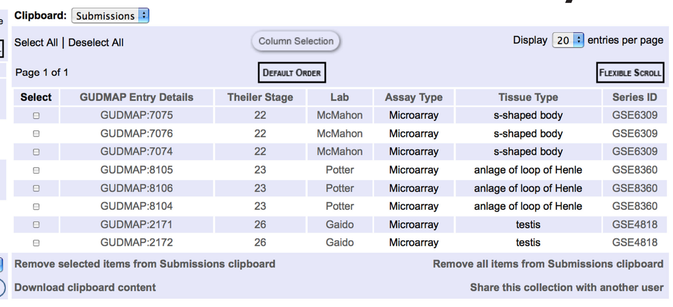
In situ data
- In situ hybridization screens (wholemount and section)
- In situ analysis of transgenic reporter screens (wholemount)
- Immunohistochemistry (section)

cDNA Microarray data
- Array analysis of laser-captured components of the developing GU system
- Array analysis of FACS-isolated cells from transgenic reporter mice

In situ data

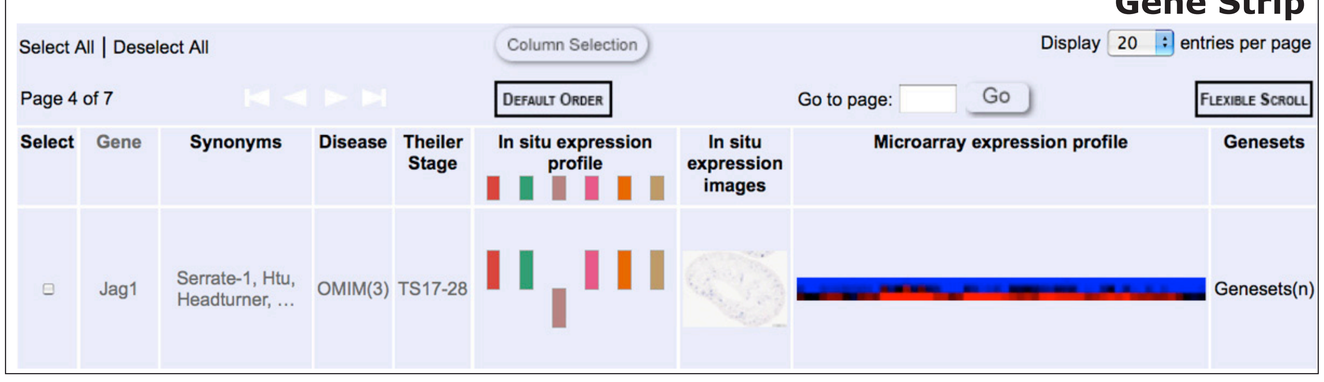


cDNA Microarray data



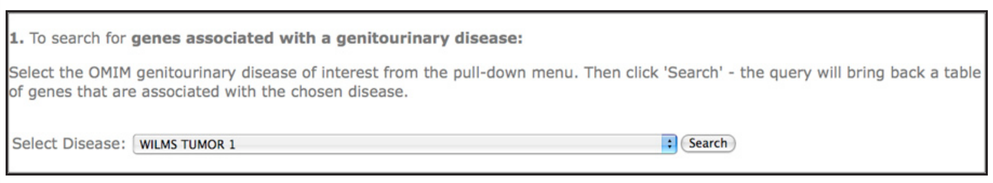
To facilitate integration of in situ data, microarray expression profiles, and disease associations, the GUDMAP Consortium has developed a Gene Strip interface that allows users to access these datasets easily. In addition, we are developing a range of tools that will allow users to collect and analyze these datasets.

Gene Strip



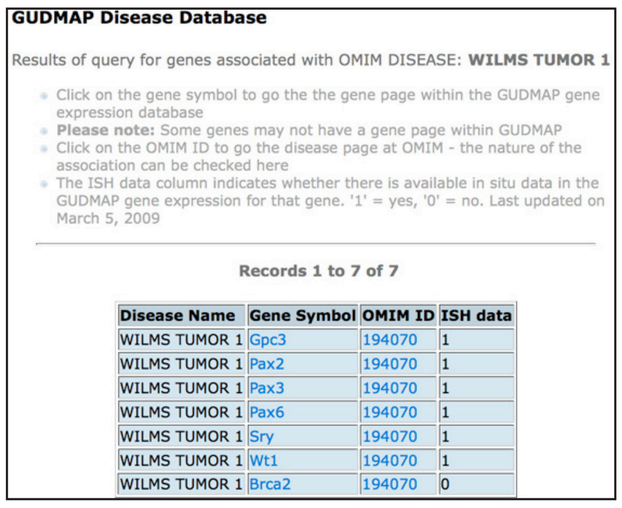
Disease Resource

A searchable database of associations between:
- Genes & OMIM Diseases (with GU component)
- Genes & Mammalian Renal/Urinary Phenotypes
- Genes & Mammalian Reproductive Phenotypes



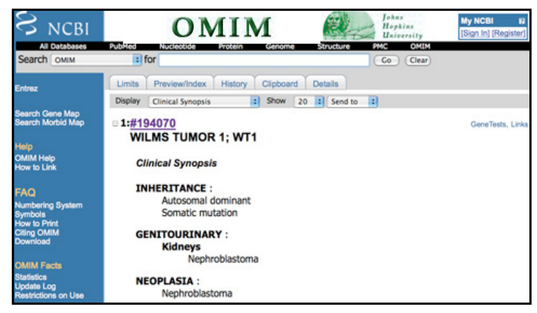
Associations are obtained from
1. NCBI *mim2gene* file download *ftp://ftp.ncbi.nlm.nih.gov/gene/DATA/*
2. Matching gene symbols in the main text of the OMIM entry

Disease-gene associations are searchable with results presented in a simple table.



- Link into the GUDMAP gene expression data via Gene Symbol
- Links out to OMIM disease page via OMIM ID
- Genes with ISH data in GUDMAP are flagged in the table

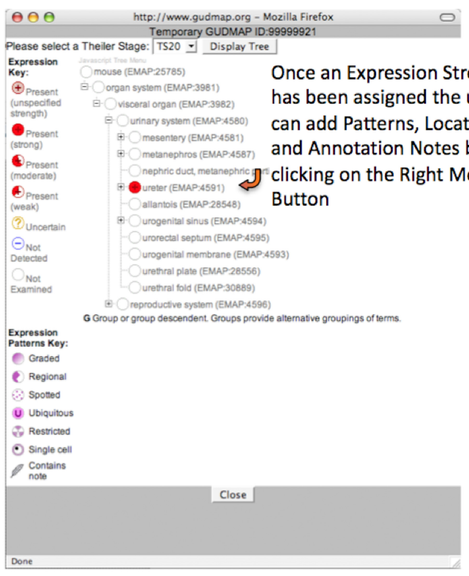
The **clinical synopsis** of OMIM disease entries is used to determine if the disease has implications for the **GU system**. It is searched for key GU terms such as '**renal**', '**nephro-**', '**GU**', and '**reproductive**'.



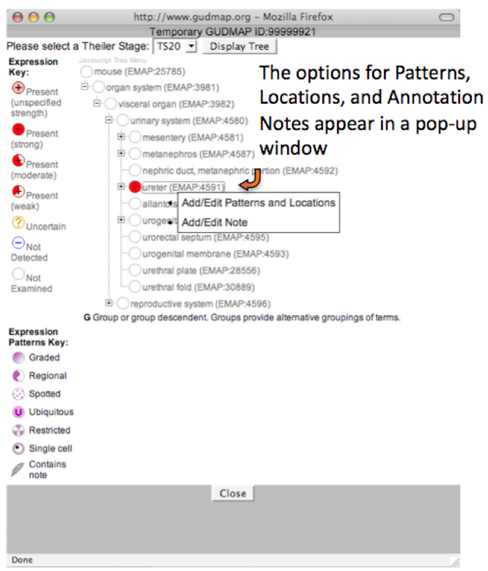
Submitting Data - Online Annotation Tool

The GUDMAP Editorial Office and Database Development Team has developed an Online Annotation Tool that simplifies in situ data submission through an ontology-based graphical user interface.

Annotation Tool



Once an Expression Strength has been assigned the user can add Patterns, Locations, and Annotation Notes by clicking on the Right Mouse Button

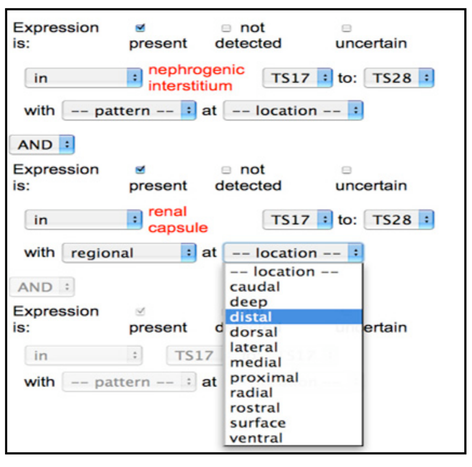


The options for Patterns, Locations, and Annotation Notes appear in a pop-up window

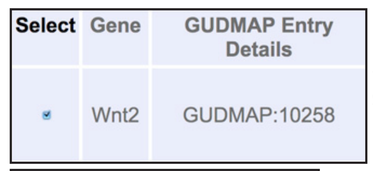
- A high-resolution anatomy ontology has been developed by members of the GUDMAP consortium to describe the subcompartments of the developing murine genitourinary tract.

- This ontology is incorporated into the Online Annotation Tool where it is used to describe in situ gene expression patterns.

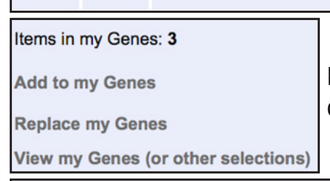
Using The Database



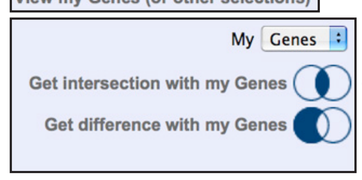
< Boolean Query
The web interface enables users to perform advanced, Boolean queries in addition to more basic browse query functions. Complex queries can be constructed to search for gene expression based on selected anatomical structures.



Search and select



Build, edit, view collections



Analyse collection

Collections >
Enables users to build collections of GUDMAP entries, genes and images. It is then possible to further analyse and filter these sets using standard operators (e.g. union, intersect) to find similarities and differences.

References

Little MH *et al*. (2007). A high-resolution anatomical ontology of the developing murine genitourinary tract.

Gene Expr Patterns. 7(6):680-99.

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