The Guide to IMMUNOPHARMACOLOGY (GtoImmuPdb) has been developed as an extension to the existing Guide to PHARMACOLOGY (GtoPdb).

In practice, this means that rather than build a new database, the underlying GtoPdb schema has been extended to incorporate new immune system specific data types (such as processes and cell types). It also means the existing GtoPdb website has been further developed to surface this new data and incorporate it into the existing search and browse mechanisms.

GtoImmuPdb does not therefore have its own website. What has been developed is a new portal (home page) which serves as a unique immunological access-point to the Guide to PHARMACOLOGY.

http://dev.guidetopharmacology.org/immuno

The portal has its own unique branding (header bar, logo and colour scheme) to distinguish it, but retains many of the layout features from the main GtoPdb site. This consistency should help users already familiar with GtoPdb to orientate themselves with the new GtoImmuPdb.

Users can familiarise themselves with the existing GtoPdb site by reading the website tutorial:

http://www.guidetopharmacology.org/GuidetoPHARMACOLOGY_Tutorial.pdf

The guide in this document gives an overview of the new GtoImmuPdb portal, and illustrates the new additions to existing pages that have been developed for GtoImmuPdb.

Information on the new data incorporated into GtoImmuPdb is described in more detail in other documentation.

Process
Cell Type
Disease and News panels not yet implemented

Site search incorporates process and cell type data

Side-bar links to release documentation and/or user guide

GtoImmuPdb User Guide – Main Portal site flow

Target Families Page

Target Family Page

Detailed Target Page

Process Association List

Cell Type Association List

Ligand Page
GtoImmuPdb User Guide – Target Families Page

Uses same page as for GtoPdb, but has the GtoImmuPdb view switched on.

GtoImmuPdb view has its own header and menu-bar.

Toggle button switches between GtoImmuPdb and GtoPdb view.

Target families displayed in hierarchical tree (as in GtoPdb)

Families containing targets 'flagged' as being of immunological relevance are highlighted.

Clicking on family name, while in GtoImmuPdb view, will link to the GtoImmuPdb view of that family's page.
GtoImmuPdb view has its own header and menu-bar.

Uses same page as for GtoPdb, but has the GtoImmuPdb view switched on.

GtoImmuPdb view has its own header and menu-bar.

Toggle button switches between GtoImmuPdb and GtoPdb view.

Link to detailed view of that target.

Targets ‘flagged’ as being of immunological relevance are highlighted.
New GtoImmuPdb sections added that surface immune specific data added for GtoImmuPdb

At this level, header remain as existing GtoPdb version. But includes link back to GtoImmuPdb Portal

Within the contents, new sections are highlighted:

- Immunopharmacology Comments
- Immuno Cell Type Associations
- Immuno Process Associations
## Immunopharmacology Comments

- General comments, with any references, provided by our curators.

## Immuno Cell Type Associations

Each sub-section gives details of the association between the target and the GtoImmuPdb top-level cell type category.
- Displays any associated Cell Ontology terms.
- Displays curator comments and references.

<table>
<thead>
<tr>
<th>Immune Cell Type</th>
<th>Cell Ontology Term</th>
<th>Comment</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>pro-B-lymphocytes, B lymphocytes &amp; Plasma cells</td>
<td>immature B cell (CL:0000110)</td>
<td></td>
<td>73</td>
</tr>
<tr>
<td>Mast cells</td>
<td>mast cell (CL:0000197)</td>
<td>no comment</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>mucosal type mast cell (CL:0000485)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T lymphocytes (gamma-delta type) and their immediate progenitors</td>
<td>mature gamma-delta T cell (CL:0000800)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Killer (NK) cells</td>
<td>non-specified (GTOIMMUPDB_DEFAULT_CELL:4)</td>
<td>A2a receptor has non-specific association to Natural Killer cells</td>
<td></td>
</tr>
</tbody>
</table>

## Immuno Process Associations

Each sub-section gives details of the association between the target and the GtoImmuPdb top-level immune process category.
- Displays any associated Gene Ontology (GO) terms, IDs and GO evidence codes.
- Displays curator comments and references.

<table>
<thead>
<tr>
<th>Immune Process</th>
<th>Immune Process ID</th>
<th>Comment</th>
<th>GO Annotation</th>
<th>GO Processes</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation and responses to signals</td>
<td>4</td>
<td></td>
<td>Associated to GO processes</td>
<td>inflammatory response (GO:0006954) TAS</td>
<td></td>
</tr>
<tr>
<td>Inflammation</td>
<td>7</td>
<td></td>
<td>Associated to GO processes</td>
<td>inflammatory response (GO:0006954) TAS</td>
<td></td>
</tr>
</tbody>
</table>
New page developed to specifically surface details of immune process associated to targets

Uses the GtoImmuPdb header and menu-bar.

Quick links to each target class section of the table

Tabs to switch between the different GtoImmuPdb Immuno Process top-level categories

Table is broken up into each target class (here just showing GPCRs)

Includes target name linking to detailed view page

Shows comments & Gene Ontology (GO) associated terms

Indicates whether target has been manually tagged as being in GtoImmuPdb by curators
New page developed to specifically surface details of immune cell types associated to targets.

Uses the GtoImmuPdb header and menu-bar.

Quick links to each target class section of the table.

Tabs to switch between the different GtoImmuPdb Immuno Process top-level categories.

Table is broken up into each target class (here just showing GPCRs).

Indicates whether target has been manually tagged as being in GtoImmuPdb by curators.

Includes target name linking to detailed view page.

Shows comments & Gene Ontology (GO) associated terms.
Search mechanisms have been developed to incorporate terms, IDs, comments and definitions for processes, cell types and their associations to targets.

Example search results for 'Cell-mediated immunity'
Shows hit against target under GtoImmuPdb Process category

Example search results for 'immature B cell'
Shows hit against target under Cell Ontology Cell Type & Definition
Currently no changes have been made to the ligand list page for GtoImmPdb. So users see the same as you get for GtoPdb.

Other sections on the GtoImmPdb Portal for Disease and News are currently non-functioning – but represent feature that are planned for incorporation before the beta-release in Spring 2017.

The menu-bar will be further developed so for GtoImmPdb views the links are more relevant and provide access to information about the project and GtoImmPdb specific help.