Proceedings of the British Pharmacological Society at http://www.pA2online.org/abstracts/Vol20Issue1abst006P.pdf

The IUPHAR Guide to IMMUNOPHARMACOLOGY portal

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Introduction A 2016 global pharmaceutical R&D review lists the top-three general mechanisms of action as immuno-stimulant, anticancer immuno-therapy, immune-suppressant, covering 1706, 399, 221 therapeutic agents, respectively (1). The increasing dominance of these categories is reflected in growing academic/commercial research in the pharmacology of immunity, inflammation, infection (I-I-I). Data exchange between these three research communities is therefore critical to development of new drugs. Our Wellcome Trust-funded project to produce the IUPHAR Guide to IMMUNOPHARMACOLOGY (GtoImmuPdb) addresses this need by providing a new portal that is both 'immunologist-friendly' for pharmacological information and 'pharmacologist-friendly' for accessing immunological agents/targets.

Method The project infrastructure and curation model is based on the IUPHAR/BPS Guide to PHARMACOLOGY database (GtoPdb)(2,3). The resource is a joint initiative between the International Union of Basic and Clinical Pharmacology (IUPHAR), the British Pharmacological Society (BPS) and the University of Edinburgh, with funding from The Wellcome Trust. GtoImmuPdb is being built as a major extension of the GtoPdb. New curation input tools have been designed in Java and Postgres database tables expanded to encompass GtoImmuPdb specific data.

Results Over 500 protein targets and over 900 small-molecule ligands have been curated into GtoImmuPdb from the existing GtoPdb. The database has been extended to include biological processes and their associations to existing targets, largely through data-mining of immuno-relevant process terms from the Gene Ontology (4). The resource also includes cell type associations to targets. In this instance, the controlled vocabulary of the Cell Ontology (5) has been used to formalise connections between targets and cells. Extension have been introduced to incorporate disease associations to both targets and ligands, *via* resources such as OrphaNet (6), Disease Ontology (7) and OMIM (8).

Conclusions Development of GtoImmuPdb has achieved the following: Immunological-relevant target information, collected from primary literature, verified and annotated by expert curators and peer-reviewed by NC-IUPHAR subcommittees; Integration with GtoPdb for reciprocal navigation; An expanding set of compounds, peptides and antibodies active in I-I-I systems; Reciprocal links with immunology-relevant databases; Immunologist-friendly interfaces and search tools; Fully downloadable data. The third public beta release was made in March 2018, with current funding supporting development and expansion to autumn 2018.

References

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