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A new resource, IUPHAR Guide to immunopharmacology

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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 and immune-suppressant, covering 1706, 399 and 221 therapeutic agents, respectively[1]. The increasing dominance of these categories is reflected in growing academic and commercial research in the pharmacology of immunity, inflammation and infection (I-I-I). Data exchange between these three research communities is therefore critical to the 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 and 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 the Postgres database tables expanded to encompass GtoImmuPdb specific data.

Results

Curation tools are in place to add in immunological tags and comments to existing targets and ligands in GtoPdb. The database has been extended to include biological processes and associations to targets, largely through data-mining of immuno-relevant process terms from the Gene Ontology[4]. Developments have also included 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, via resources such as OrphaNet[6], Disease Ontology[7] and OMIM[8].

Conclusion

Our development version of the 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
- Public beta release planned for spring 2017, current funding will supports development and expansion to autumn 2018

References

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