

A Draft Immunotoxicity Vocabulary for ToxRefDB



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ToxRefDB Vocabulary



Endpoint super category	Endpoint category	Endpoint subcategory	Endpoint class	Endpoint subclass	Effect type	Effect type	Effect type	Target site a	Target site b
Developmental Reproductive	Developmental	Developmental Malformation	Cardiovascular	Heart	Developmental	Heart	Defect A-V Septum	Septum Interventricular	[Not Specified]
Developmental Reproductive	Developmental	Developmental Neurotoxicity	Learning and Memory	Memory	Learning and Memory	Maze	Sector entries	Memory	Radial-arm maze
Developmental Reproductive	Developmental	Pathology Gross	Reproductive Male	Epididymis	Pathology (Gross)	Epididymis	Reduced size	Left	[Not Specified]
Developmental Reproductive	Developmental	Developmental Malformation	General	Other	Developmental	Thymus	Small	[Not Specified]	[Not Specified]
Systemic Carcinogenic	Maternal	Pathology Non-Proliferative	Endocrine	Thymus	Pathology (Non-neoplastic)	Thymus	Atrophy	[Not Specified]	[Not Specified]

8834 rows, endpoints for cancer, developmental and reproductive toxicity

Endpoints selected to describe effects, based on toxicity data from testing hundreds of chemicals

In rats and rabbits (<http://actor.epa.gov/toxrefdb/faces/BasicInfo.jsp>)

Search by endpoint (study type, species, effect type) to return list of chemicals associated with effect

(<http://actor.epa.gov/toxrefdb/faces/SearchByEndpoint.jsp>)

Immunotoxicity Classification



- **Immunosuppression (immunostimulation)**
- **Allergic hypersensitivity**
- **Autoimmunity**
- **Endpoints are relevant for adult and developmental exposure effects**

Immunotox Endpoint Interpretation



Specificity, Complexity

Indicator	Assessment	Function	Interpretation
Lymphoid organ data	Weights, cellularity, viability, architecture	Maturation, differentiation	Suggestive
Cell surface markers	Flow cytometry	Relative distribution by function/type	Suggestive/confirmatory
Cytokine production	mRNA, protein, activity	Regulation, modulation of cell proliferation, maturation, function	Suggestive/confirmatory
Innate immunity	Activation, phagocytosis killing, mediator production	Resistance to infection	Intracellular & extracellular infection, viral infections, tumors
Antibody synthesis	TDAR: "PFC" or ELISA response	Resistance to infection Toxin neutralization	Extracellular infection, viral infections, tetanus
Cell mediated immunity	Delayed hypersensitivity Cytotoxicity Cytokine production	Resistance to infection, neoplasia "Help" for Ig response	Intracellular infection, viral infections, tumors

Draft immunotox vocabulary content



- Borrowed entries from exiting ToxRefDB that may indicate immune system effects
- Added new categories, subcategories endpoint classes and subclasses, effect types and targets that may be generated in immunotoxicity studies

Next Steps and Caveats



- Incorporate into ToxRefDB
- Test ability to capture immunotox data in published studies
- Minimal outside input on entries
- Is the structure adaptable to other vocabularies?