MANCHESTER 1824

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REPRESENTING INTEGRATED BIOLOGICAL DOMAINS IN OWL

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Why is experiment metadata required?

1. To verify whether an experiment has already been carried out.

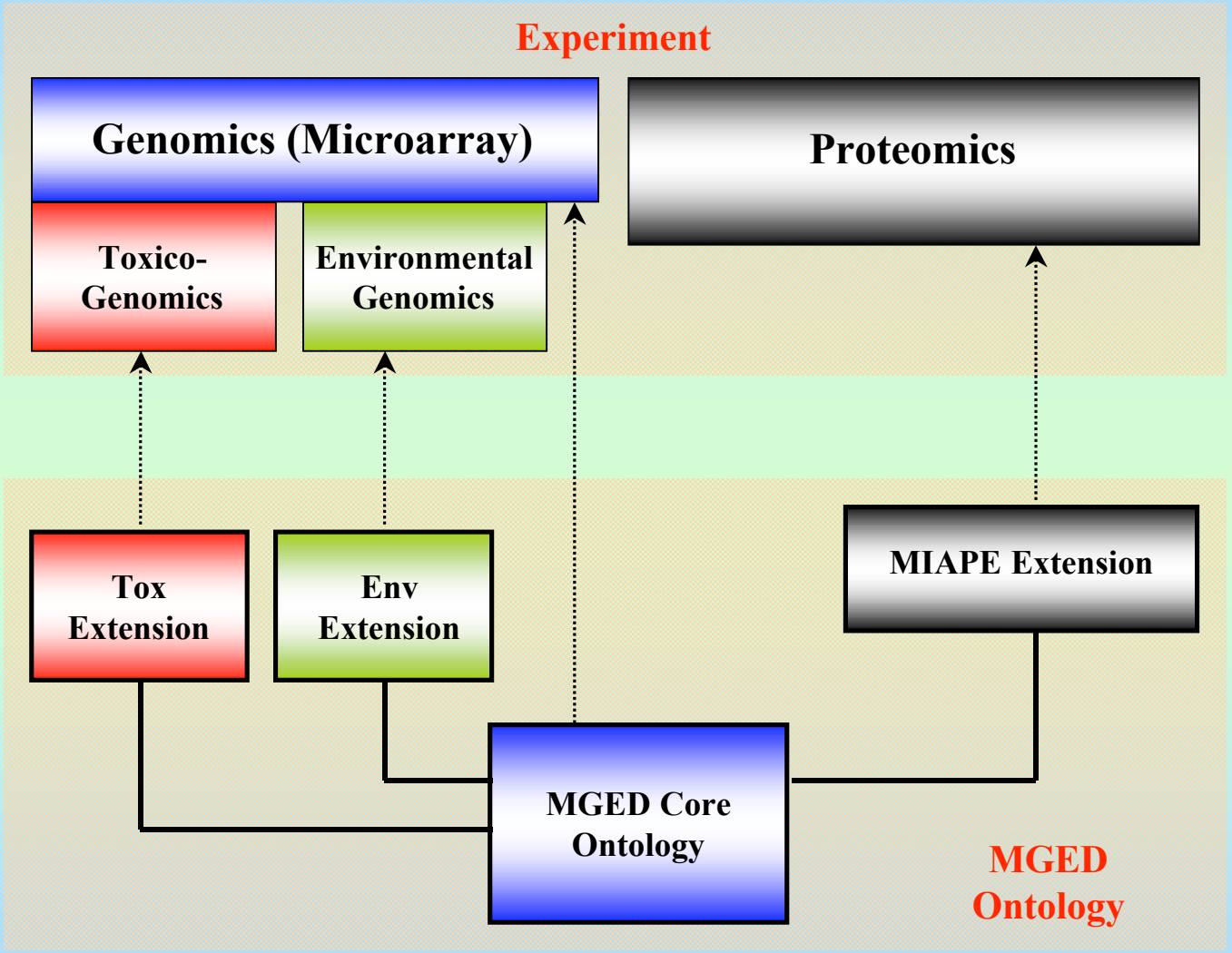
2. To validate experiment results.

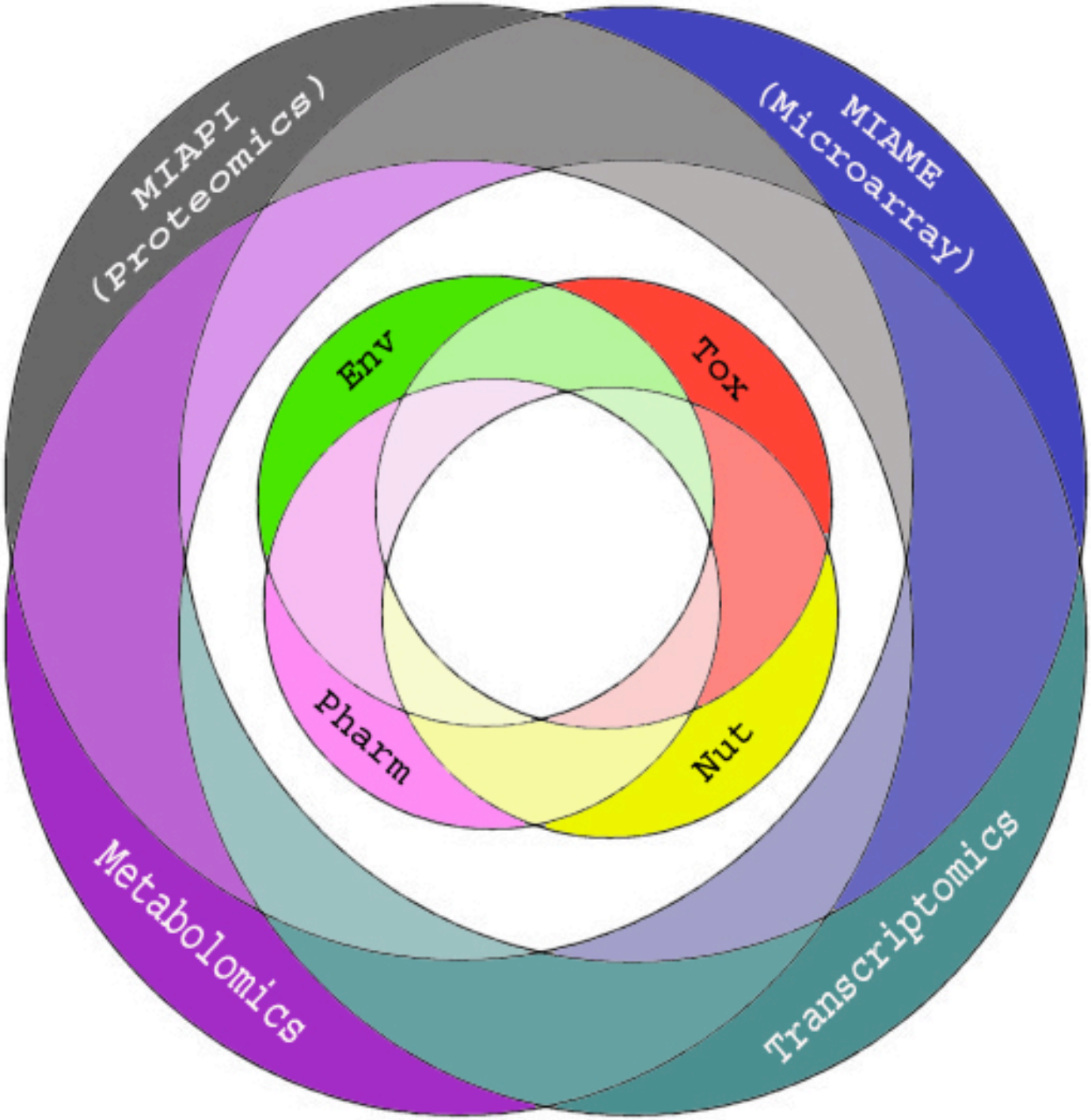
3. To replicate an experiment as a part of a wider investigation.

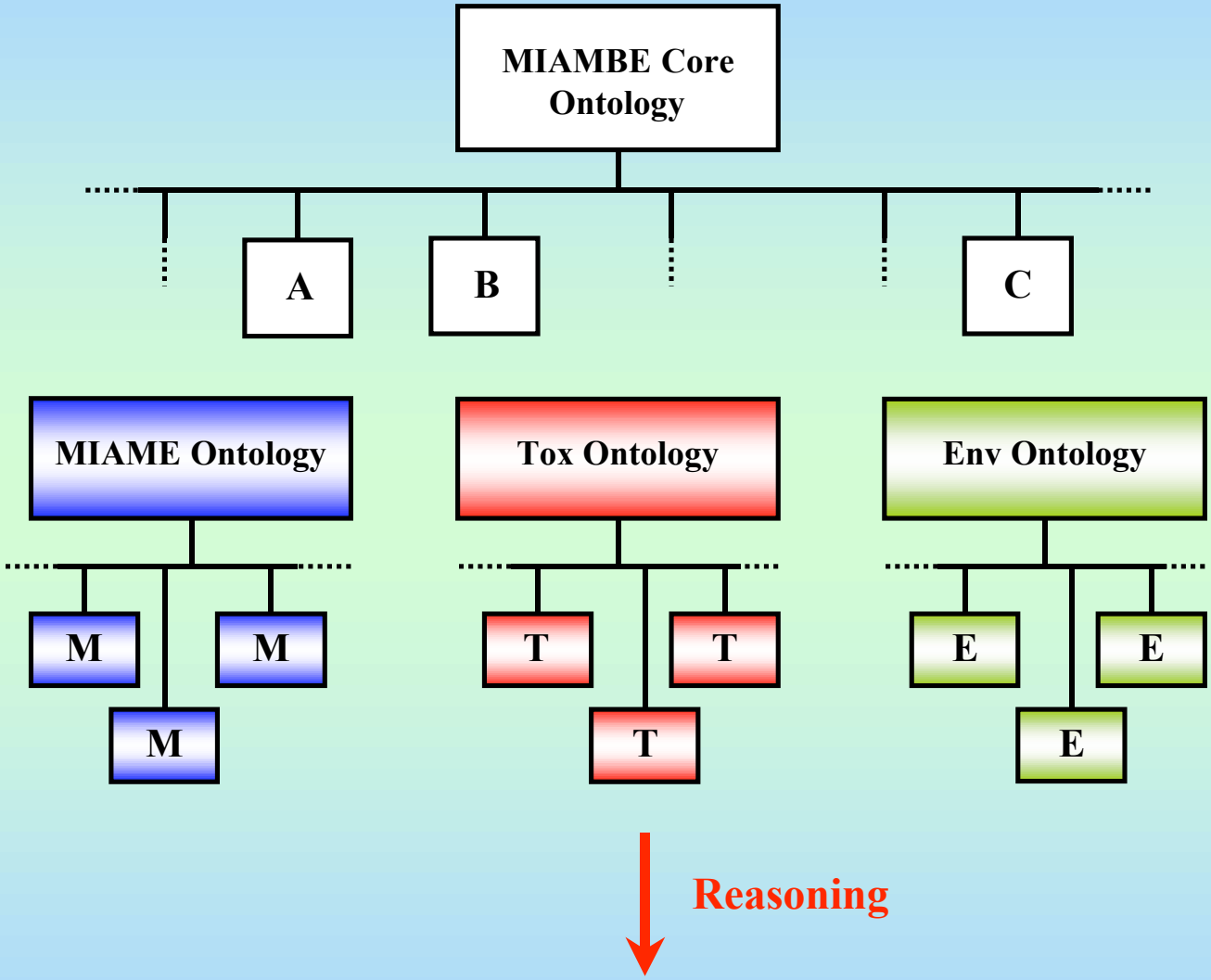
Ontology Engineering

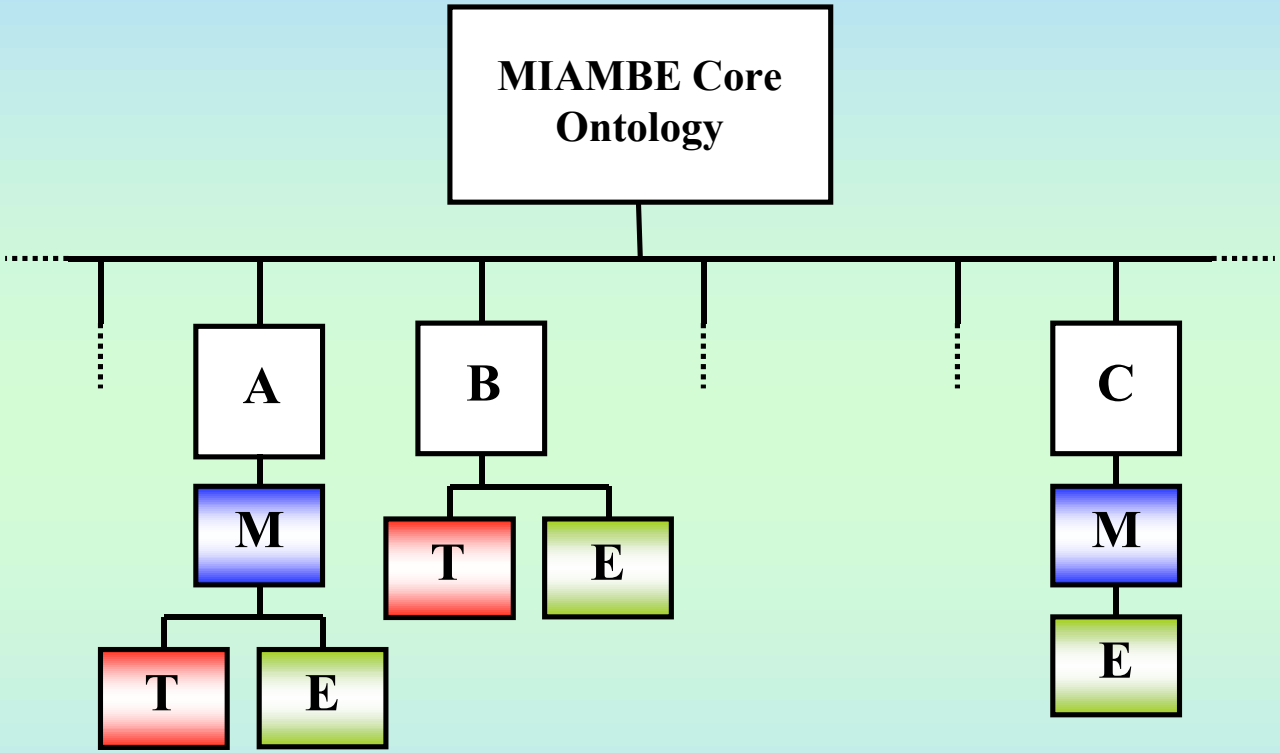
1. Purpose – MGED ontology is used to annotate MIAME.

2. Available technologies and methods
   - OWL
   - Machine Inference
   - Normalisation


Experiment
Genomics (Microarray)
Proteomics
Toxico-
Genomics
Environmental
Genomics
Tox
Extension
Env
Extension
MIAPE Extension
MGED Core
Ontology
MGED
Ontology


MIAPI
(Proteomics)
MIAME
(Microarray)
Env
Tox
Pharm
Nut
Metabolomics
Transcriptomics


MIAMBE Core Ontology
A
B
C
MIAME Ontology
Tox Ontology
Env Ontology
M
M
M
T
T
T
E
E
E
Reasoning


MIAMBE Core Ontology
A
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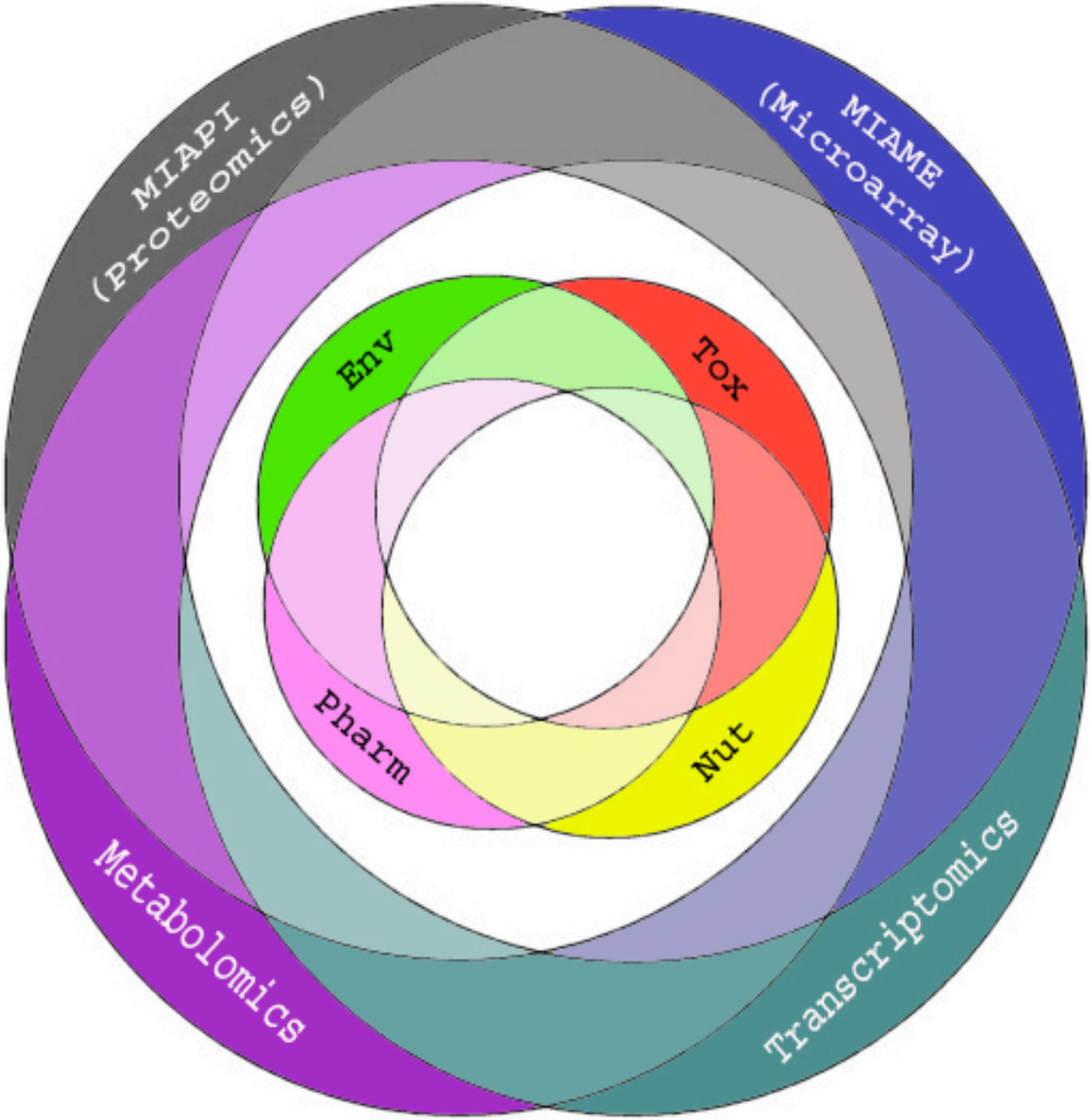
E

Advantages of multiple OWL ontologies

- Machine inference
- Standard ontology language
- Normalisation (A. Rector, 2003)
- User-centred design (RSBI)
- Clear conceptualisation for annotation tool authors
- Database harmonisation


MIAPI
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Future Tasks

- Develop experiment models with each community
- Build OWL ontologies (MIAMBE, MIAME, and Env)
- Create views of the ontologies in annotation tools (e.g. maxdLoad)

Evaluation:

- Usability assessments
- Investigate the accuracy of experiment retrieval

References

1. Rector, A.L. Modularisation of Domain Ontologies Implemented in Description Logics and Related Formalisms Including OWL. *K-CAP Second International Conference on Knowledge Capture*, Sanibel Island, Florida, USA, October 23-26 2003.Pinto, H.S., Staab, S. and Tempich.
2. DILIGENT: Towards a fine-grained methodology for DIstributed, Loosely-controlled and evolvInG Engineering of oNTologies.

Acknowledgements

- NERC
- EBI – Helen Parkinson & Chris Taylor
- My Lab & Supervisors (Andy Brass & Robert Stevens)
- Alan Rector (& Lab), & Ian Horrocks