Emerging Life Sciences Standards

Information Sciences Standards to Enable Biomedical Research conference

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Topics

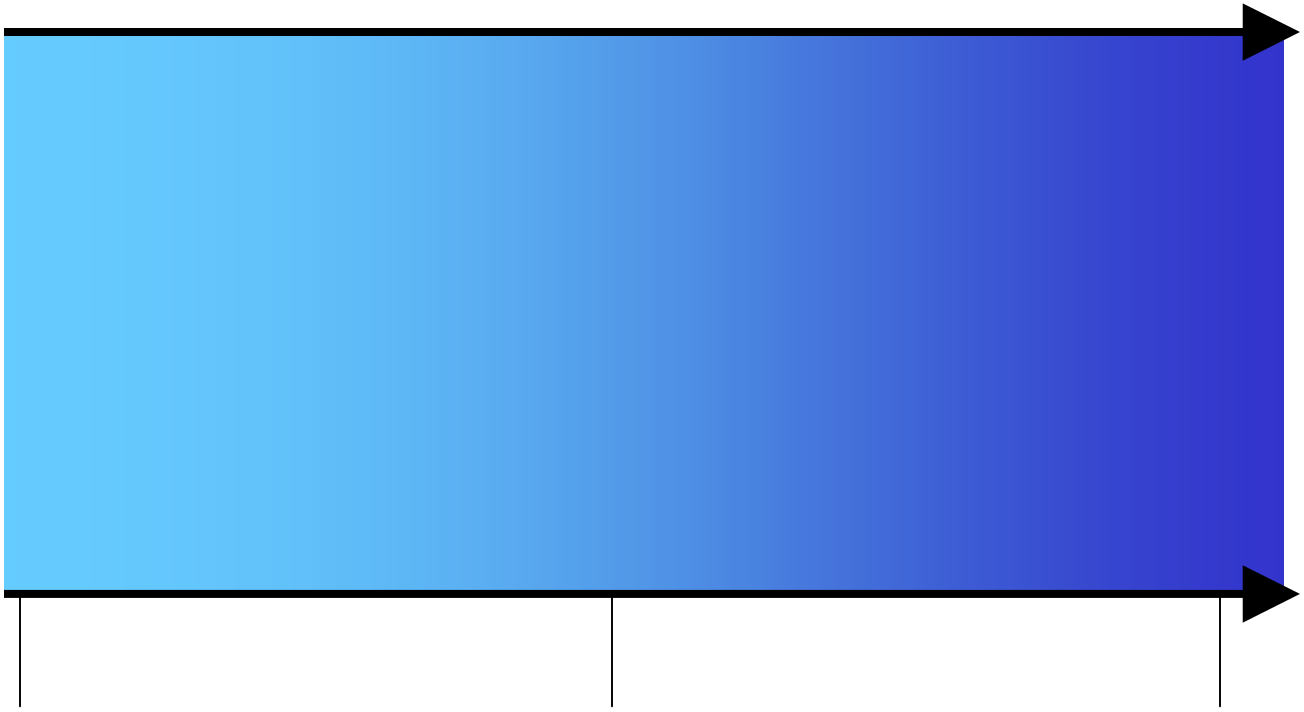
- Big Picture
- Standards Overview
- Summary

Interoperability

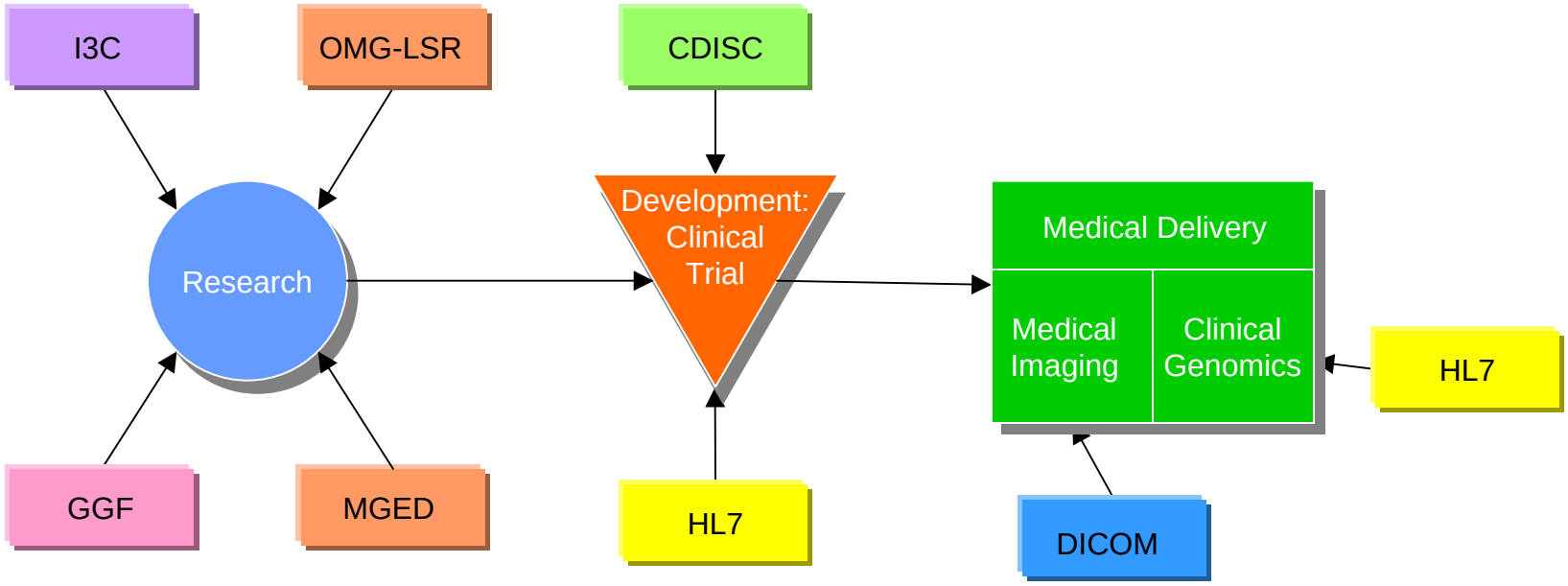
"Ability of two or more systems or components to exchange information and to use the information that has been exchanged"

[IEEE Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries, IEEE, 1990]

Organizations



Life Science Standards Bodies and Industry Consortia examples



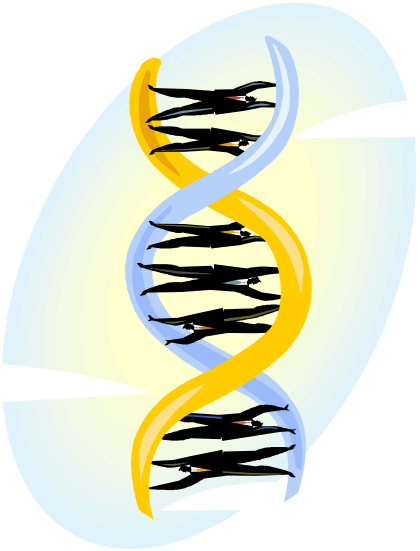
Interoperable Informatics Infrastructure Consortium

I3C

The Interoperable Informatics Infrastructure Consortium is working to facilitate and enable data exchange and data and knowledge management across the entire life science community. The I3C is developing a common standards –based platform, with a use case approach, based on XML and services.

The Problem

Life sciences research is a complex, collaborative and information-intensive process requiring effective integration of computing and information resources. The lack of adequate information and knowledge-sharing solutions has emerged as a significant barrier to productivity in both drug development and basic research.



The Solution

I3C promotes and guides the development of interoperable software frameworks and solutions in the life sciences, based on open, public specifications. Our objective is to enable the widest availability of open interoperable software to solve critical problems in drug development and life sciences research.

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I3C Working Groups and evolving work areas

- **Working Groups**
  - Life Sciences Identifiers (LSID)
- **Research Groups**
  - Registry
  - Pathways/Systems Biology
  - Life Sciences Object Ontology (in process)

LSID

LSID: Life Science Identifier. LSIDs provide a simple and standardized way to identify and access distributed biological data. LSIDs refer to persistent, location, independent, resource names.

- **An LSID is represented as a Uniform Resource Name (URN) with the following format.**
  - URN:LSID:<Authority>:<Namespace>:<ObjectID>:<Version>
- **Examples:**
  - URN:LSID:ebi.ac.uk:SWISS-PROT/accession:P34355:3
  - URN:LSID:rcsb.org:PDB:1D4X:22
  - URN:LSID:ncbi.nlm.nih.gov:GenBank/accession:NT_001063:2

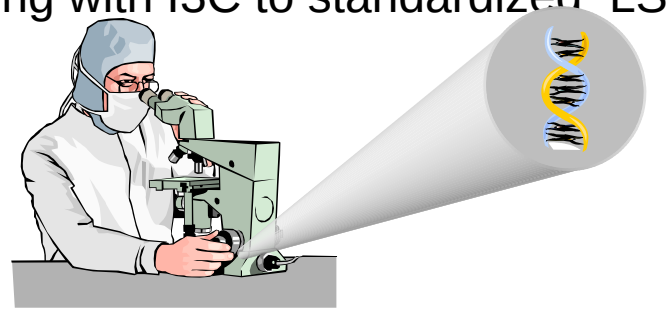
Object Management Group- Life Science Research

OMG-LSR

The Life Science Research committee of the Object Management Group is focused on improving the quality and utility of interoperability software and standardized interfaces in life science research. Structured modeling process to create standards.

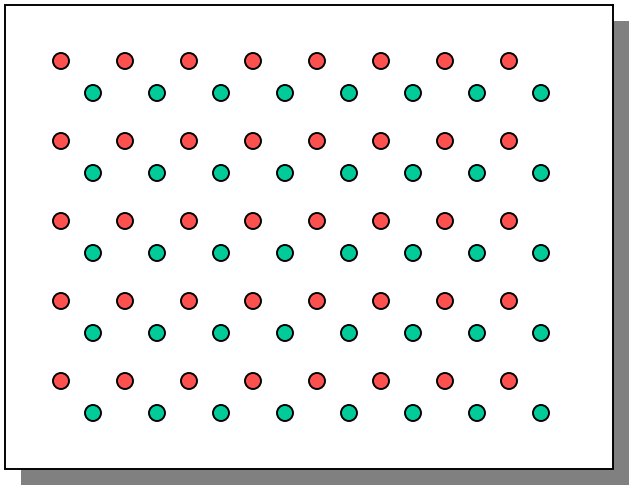
MAGE- the Microarray and GeneExpression standard addresses the representation of gene expression data and relevant annotations, as well as the mechanisms for exchanging this data. From Gene Expression Spec. 2/02

LSID- Working with I3C to standardized LSID.



Microarray Gene Expression Data Society

- MGED worked with OMG to create MAGE to exchange microarray data
- Worldwide Standard
- Comprehensive
- Driver for use of MAGE



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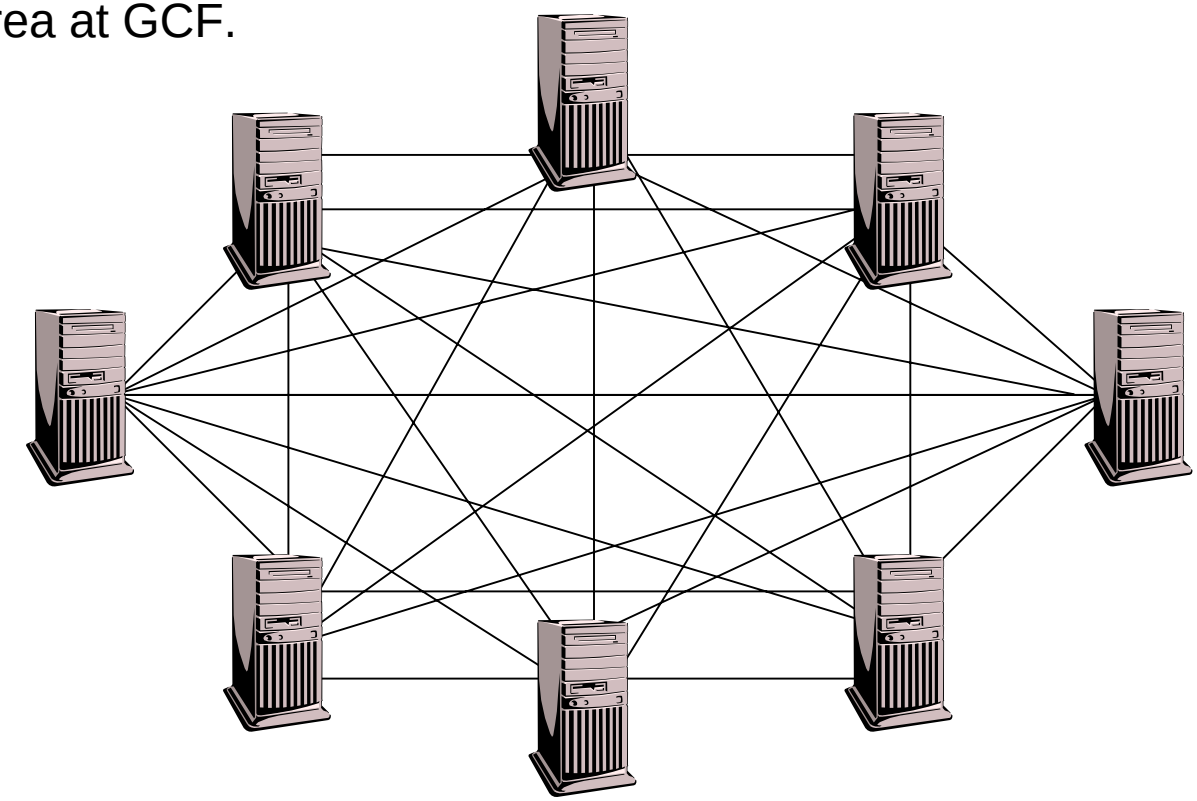
Global Grid Forum

GGF Global Grid Forum is aimed at the development of broadly based integrated grid architecture that assists the emerging grid communities which includes the life science grids.

Life Sciences Grids research Group is first industry focused area at GCF.



GGF Life Science Grid Research Group Charter

The Life Sciences Grid (LSG) Research Group explores issues related to the integration of Information Technology with the Life Sciences on a grid infrastructure. LSG RG has an industry survey in process. Global participation.

-Life Sciences Grids

-Clinical Trial Grids

-Health Grids

- Identify clear examples and the diverse use of grid in life sciences
- Discuss issues of access to data in life sciences
- Identify how the grid is being challenged by the life sciences, and where there is need for activity
- Identify different solution areas and possible reference architectures

CDISC

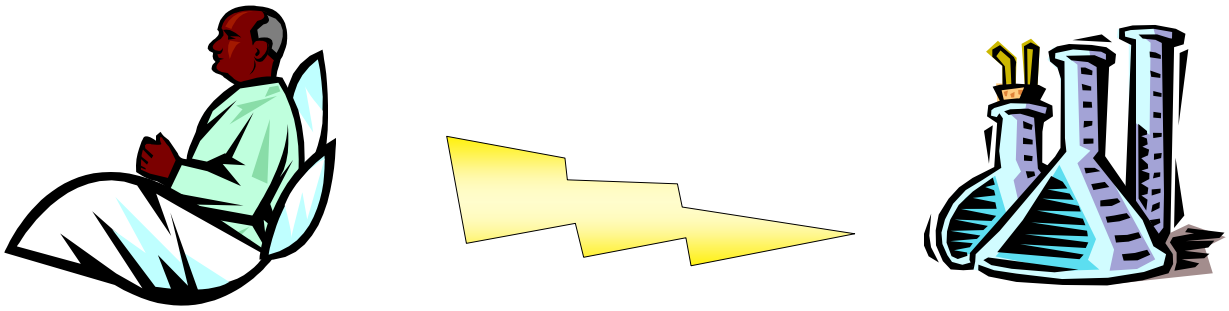
CDISC

The Clinical Data Interchange Standards Consortium develops the industry standards that support the electronic acquisition, exchange, submission and archiving of clinical trial data.

Submission Data Model, SDS, guides the organization, content and form of submission data for clinical trials.

Operational Data Model, ODM, describes the format for data collected in a clinical trial to facilitate data exchange and archiving.

LAB describes requirements to improve laboratory data interexchange. Driver to use CDISC Lab standard.



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Health Level Seven

HL7

Health Level Seven focuses on the electronic interchange of clinical information among healthcare oriented computers systems. HL7 also works in conjunction with CDISC on clinical trials data exchange standards and DICOM on medical images.

In addition to messages, HL7 also defines architecture of clinical documents that could encapsulate clinical and genomic data.

HL7 Clinical Trials

Regulated Clinical Research Information Management (RCRIM) Committee

-Focused on clinical trials data exchange.

-Works with CDISC.

-Driver for HL7 Clinical Trial Standards.

-Joint project with Clinical Genomics SIG.

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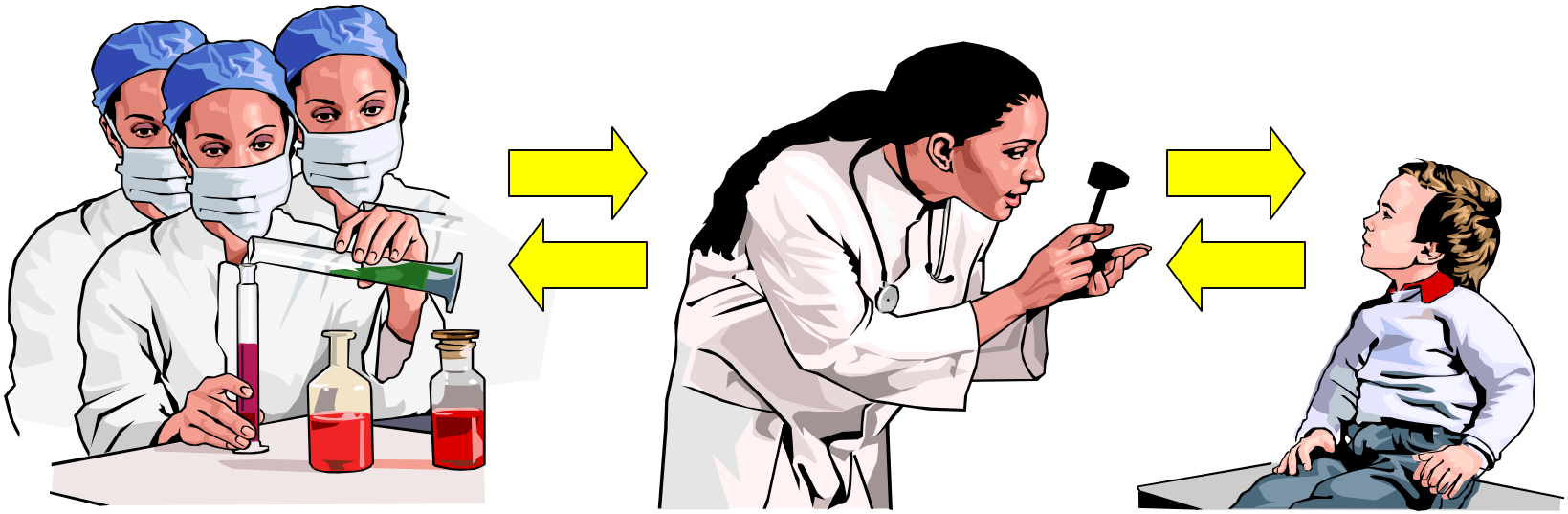
HL7 Clinical Genomics Special Interest Group Scope



- CG Based Clinical Trial Submission
- Clinical Research
- Partner Collaboration Drug Discovery/Development
- Diagnostic Testing
- Drug Selection
- Tissue Typing

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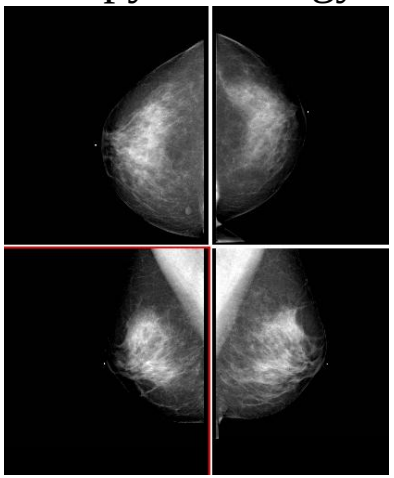
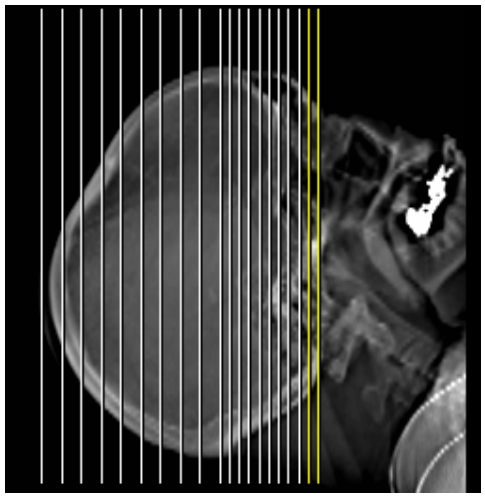
DICOM

The DICOM Standards Committee exists to create and maintain international standards for communication of biomedical diagnostic and therapeutic information in disciplines that use digital images and associated data. The goals of DICOM are to achieve compatibility and to improve workflow efficiency between imaging systems and other information systems in healthcare environments worldwide.

DICOM is used or will soon be used by virtually every medical profession that utilizes images. These include cardiology, dentistry, endoscopy, mammography, opthamology, orthopedics, pathology, pediatrics, radiation therapy, radiology, surgery.





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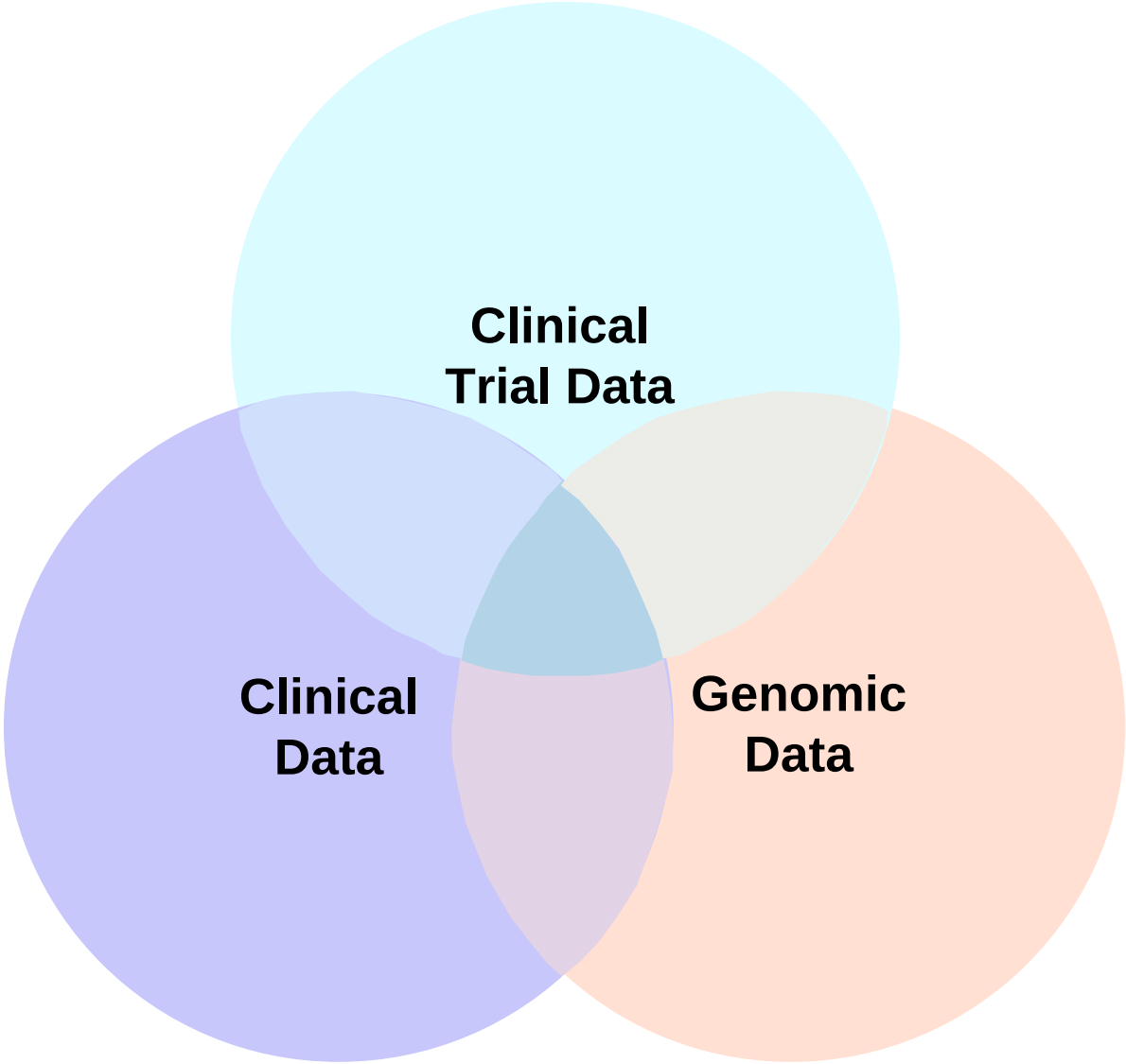
Industry Collaboration



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Summary

- Standards are important in the Life Sciences
- Standards for Life Sciences in the early days
- Standards Drivers
- Get engaged in shaping the standards