ImmPort: Immunology Database and Analysis Portal

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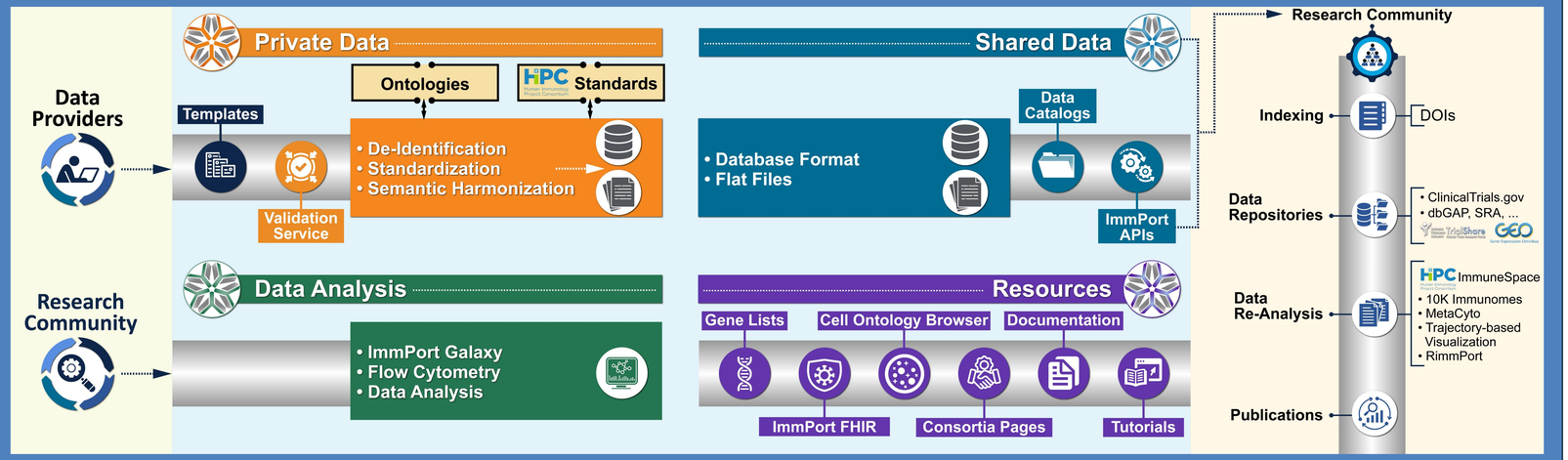
Overview of the ImmPort Ecosystem



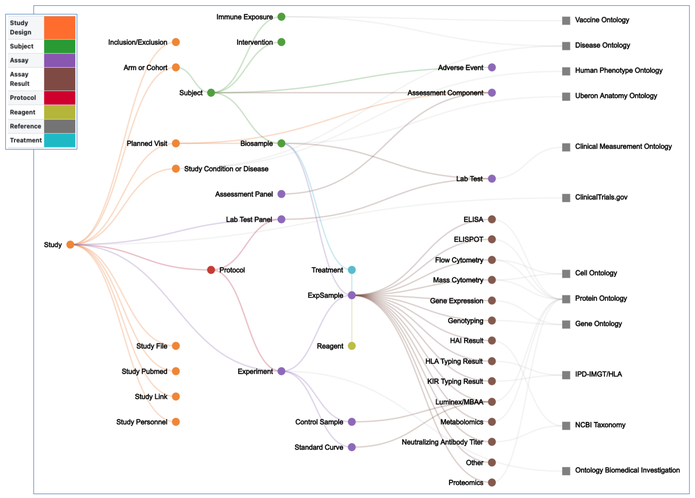
ImmPort (immport.org) is a NIAID-funded resource for sharing immunology research data and hosting web-based tools for automated analysis of data. ImmPort facilitates inter- and intra-study analysis by applying a consistent data model that captures a robust set of descriptive elements with standardized terms across publicly-shared studies. As a data sharing portal for the Division of Allergy, Immunology, and Transplantation, ImmPort focuses on studies of autoimmunity, infection and vaccine response, transplantation, and allergy.

Artificial Intelligence in Curation

ImmPort is using multiple AI tools to improve findability, accessibility, interoperability and reproducibility in data curation. Furthermore, utility of these AI-driven tools is increased by our close partnerships with scientific community users and by their curation efforts.

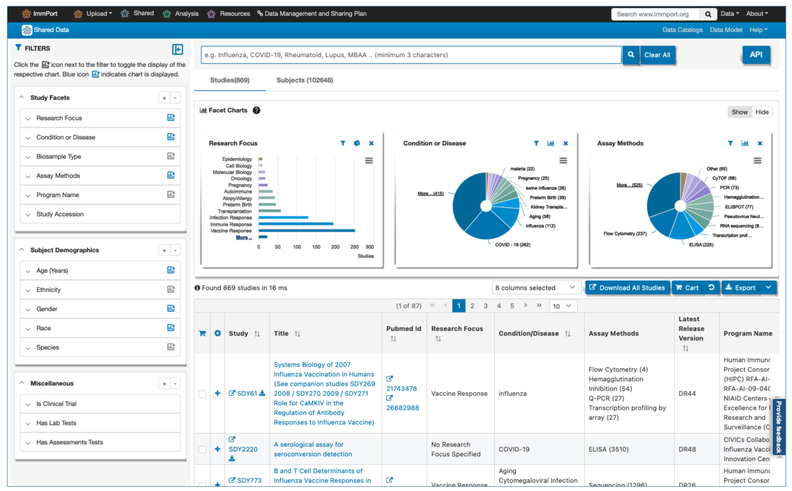
One example in development is a chatbot that queries ImmPort documentation and returns summarized answers to questions, including links to source information on the ImmPort site. Additionally, ImmPort data curators are currently utilizing AI for identification of keywords in files to promote searchability, as well as extraction of metadata and flagging of potential personally identifiable information (PII). Future targets include the exploration of AI-assisted data submission to reduce the level of effort required by data providers for data submission.

Data Model



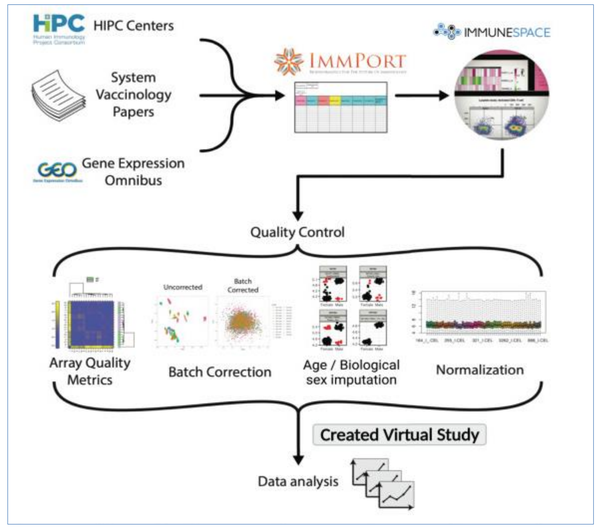
ImmPort's model for handling research data organizes information into metadata or descriptive categories, with each having its own template (or suite of templates) for data entry. The data model aims to facilitate the organization and sharing of scientific data in immunological research.

Shared Data Browser



ImmPort currently shares research and clinical trial data from over 800 studies encompassing a range of research areas, species, and assay types. All studies can be browsed using faceted search features.

User Community Driven Curation



The Human Immunology Project Consortium (HIPC) is one example of an active group in ImmPort's scientific user community. One major focus of HIPC leverages systems immunology approaches to identify molecular signatures associated with immunogenicity of many vaccines. HIPC utilized the data standards and knowledge base of ImmPort, along with AI-assisted community data curation, to support comparative analyses across different vaccines. Along with HIPC studies already present in ImmPort, keyword search techniques were used to conduct a literature search for identification of other relevant publications containing appropriate data for ingestion into ImmPort.

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