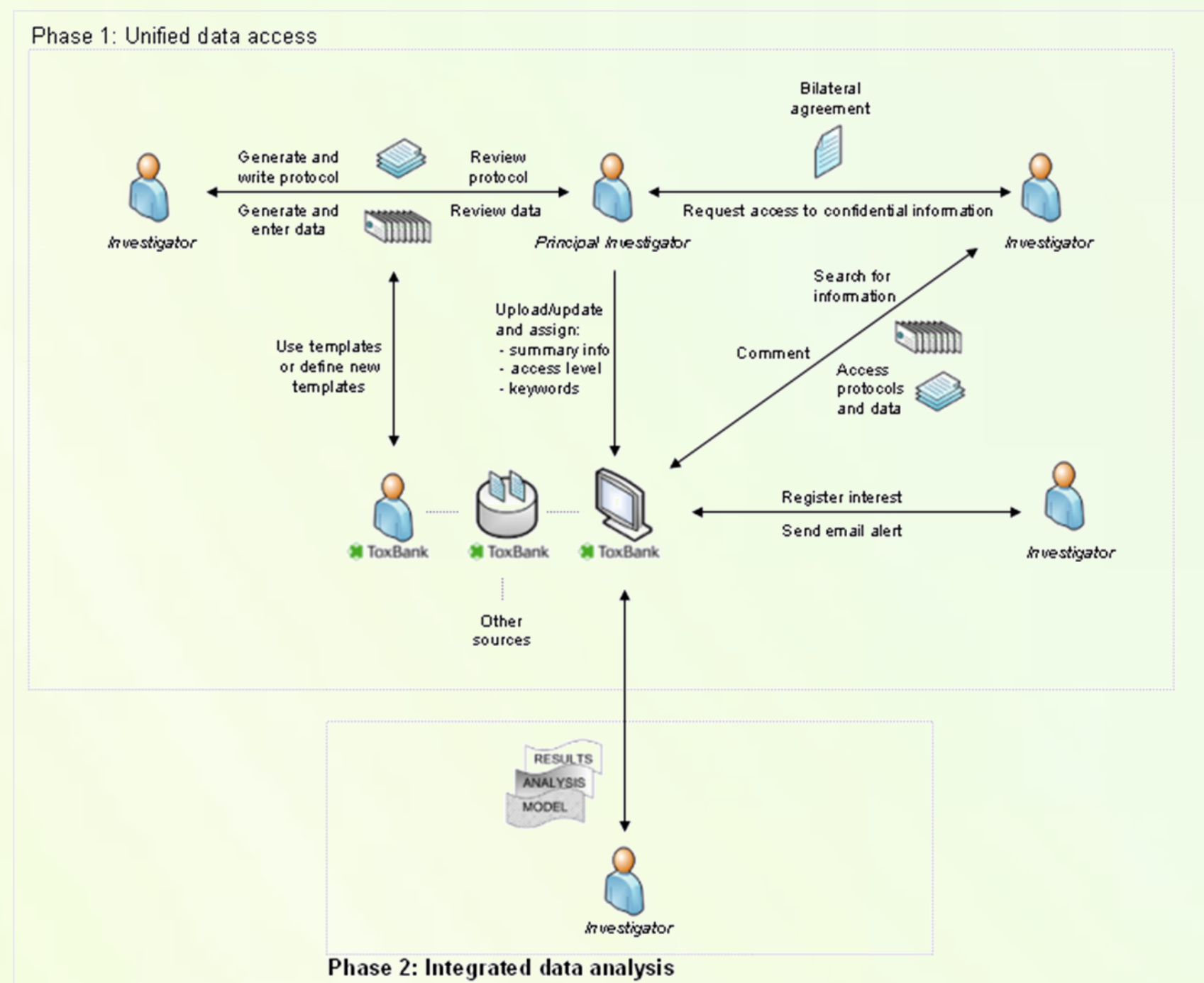


Uploading and sharing dose-response data and analysis results across the SEURAT-1 cluster

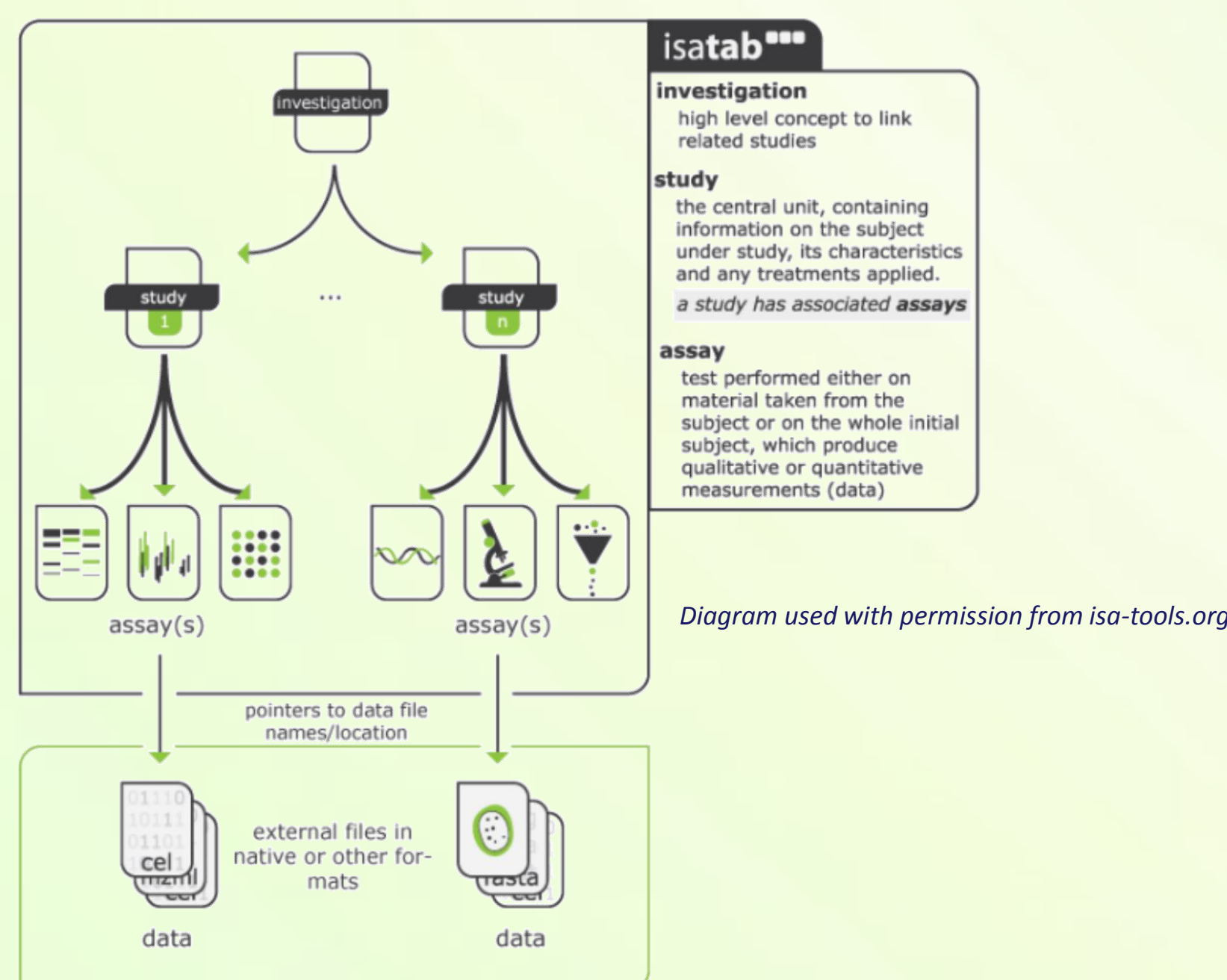
The ToxBank data warehouse

The ToxBank data warehouse will provide a web accessible shared repository of know-how and experimental results to support the SEURAT-1 cluster in developing a replacement for *in vivo* repeated dose toxicity testing. The information within the ToxBank data warehouse is uploaded from the research activities of the cluster partners as well as from other sources, such as public databases.

The data will be collected to enable a cross-cluster integrated data analysis, based on the ISA-TAB universal data exchange format. This poster illustrates the case for the uploading and sharing of dose-response data.



ISA-TAB - Universal data exchange format



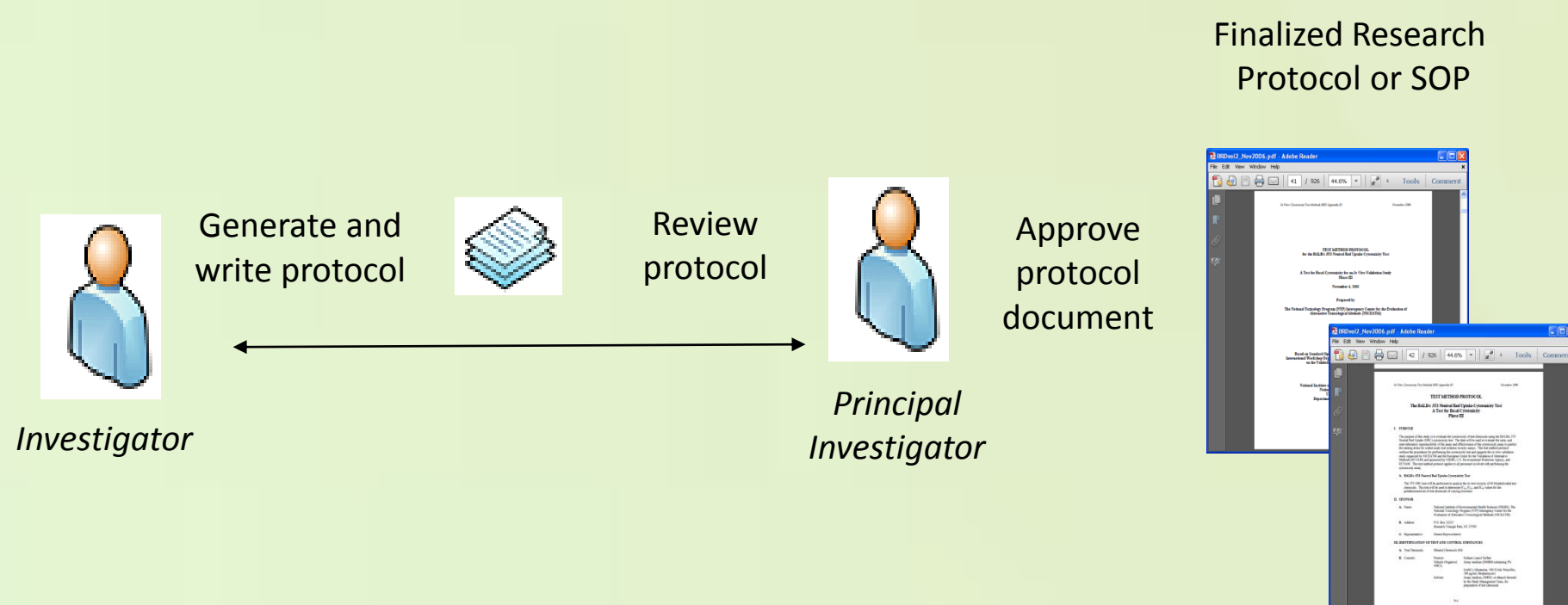
Discussion

The focus of the first phase of the ToxBank data warehouse project is the development of the unified data access. As this is being implemented over the next year, the ToxBank consortium will continue to collect requirements for the integrated data analysis to be implemented as a second phase of the ToxBank project.

The benefits of this approach include:

- It provides immediate access to existing and new protocols and data, as well as facilities for uploading information through a simple web interface.
- The use of standardized data templates and controlled terms supports cross-cluster experimental consistency and will enable integrated data analysis.
- The approach supports protocol development and collaboration which is close to current work activities, especially with the current SEURAT-1 focus on experimental development.
- The approach will link public databases and in-house data.
- The use of the ISA-TAB exchange format provides options for housing all data types including omics.

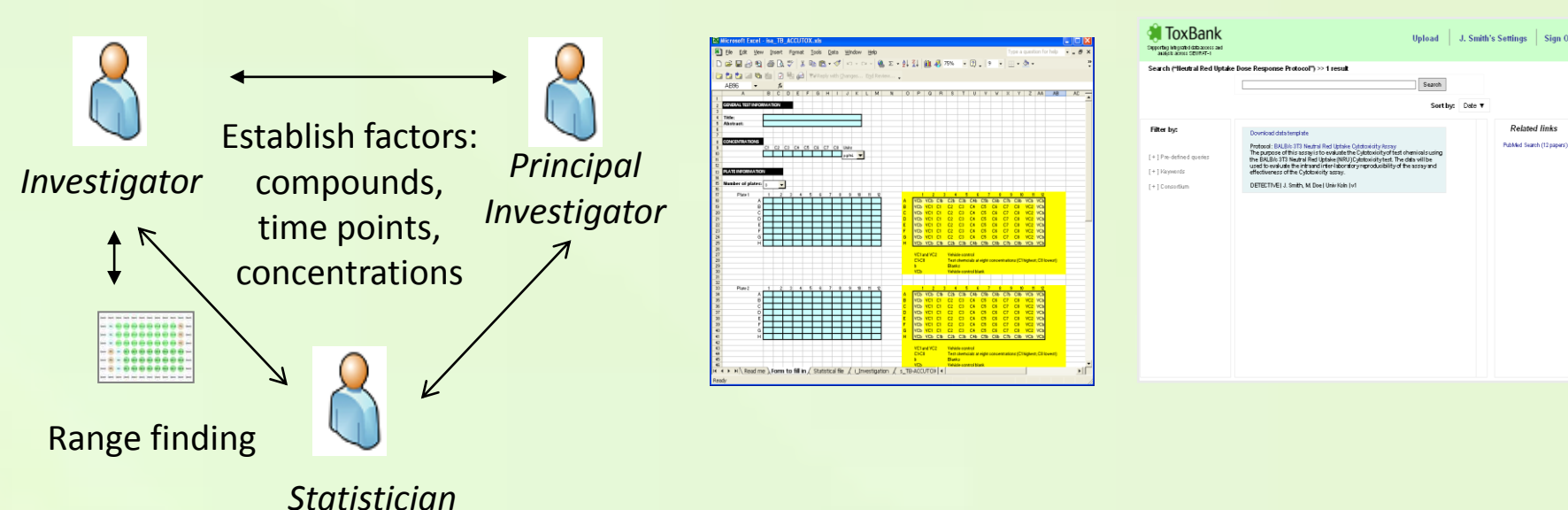
1. Develop, review and document assay protocol



In each laboratory, the principal investigator will be responsible for generating, reviewing, uploading and updating the protocols. Protocols might be generated by lab personnel performing the assay under the supervision of the principal investigator. Any questions or suggestions from other investigators concerning the protocol, as well as requests for access to the protocol (where the protocol has restricted access through ToxBank), will be directed to the principal investigator.

Guidelines will be made available through the ToxBank data warehouse describing a preferred organization of the protocol documentation. Other topics related to the writing of the protocols will also be addressed.

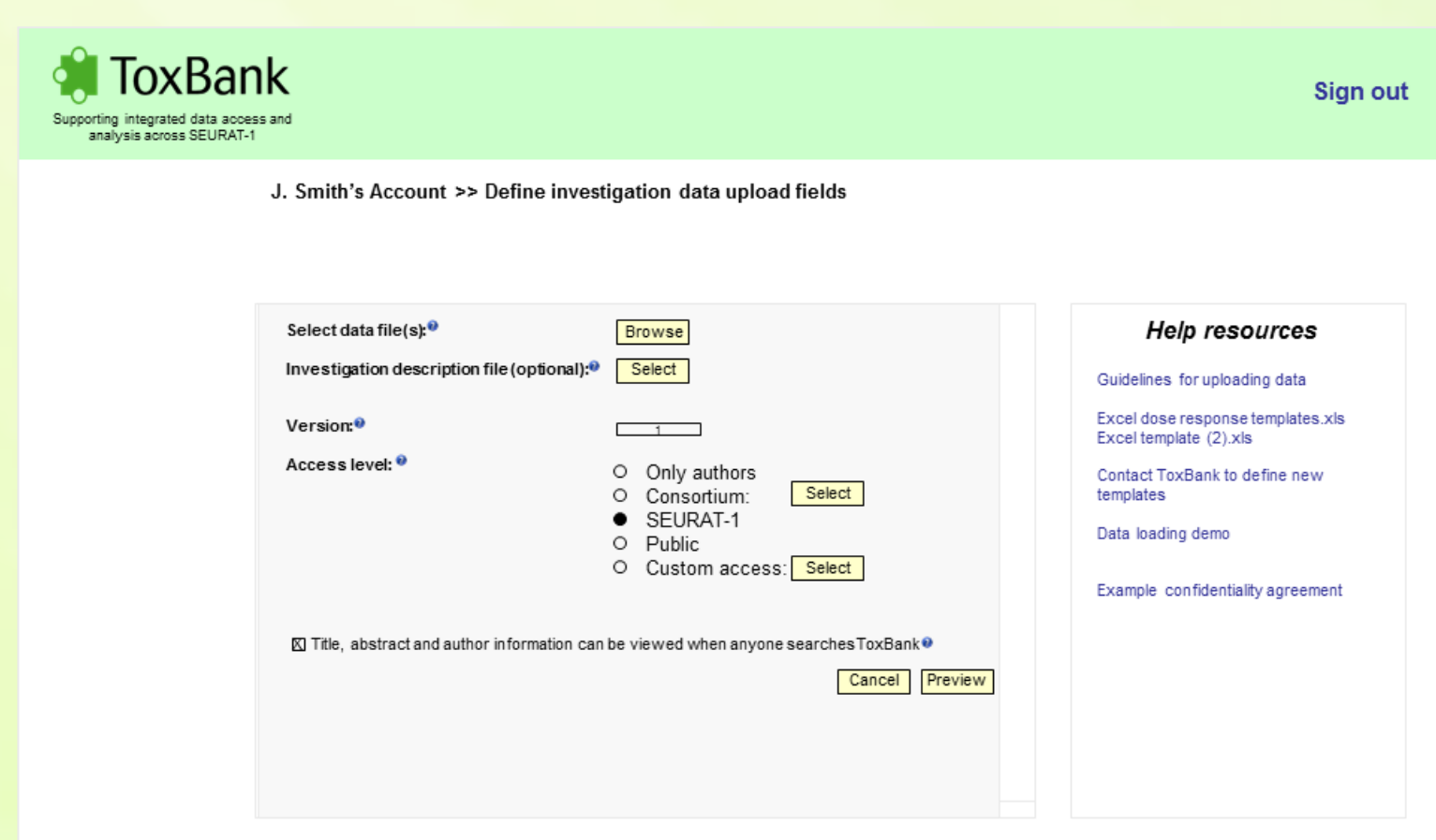
3. Design investigation and data template



Where a data template for recording the investigation results is not defined, the ToxBank scientists will work with the project's statisticians as well as with the project's investigators and/or principal investigators to define a new template that can be used across the entire cluster.

The use of standardized templates is important to ensure that minimal information is collected in a consistent way throughout the cluster and essential for combining the data to support an integrated data analysis. These templates may contain raw as well as processed data and they may point to other data files. Any template(s) will be linked to associated protocols in the ToxBank data warehouse.

5. Upload investigation data



ToxBank

Sign out

J. Smith's Account >> Define investigation data upload fields

Select data file(s)

Investigation description file (optional)

Version

Access level ☐ Only authors ☐ Consortium ☒ SEURAT-1 ☐ Public ☐ Custom access

☒ Title, abstract and author information can be viewed when anyone searches ToxBank

Help resources

Guidelines for uploading data

Excel dose response templates.xls

Excel templates (2).xls

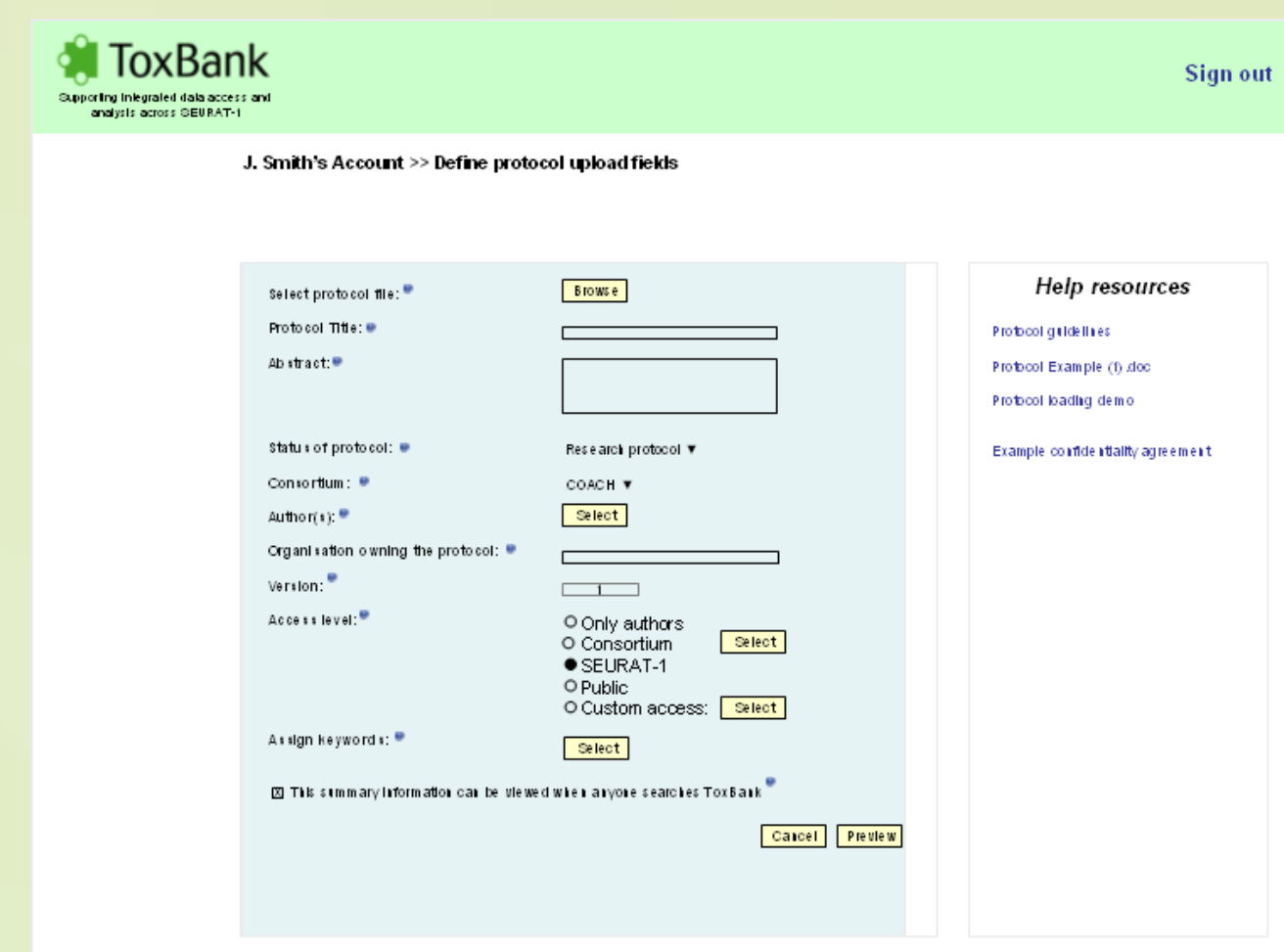
Contact ToxBank to define new templates

Data loading demo

Example confidentiality agreement

Once the data has been appropriately reviewed, it can be uploaded into the ToxBank data warehouse. An optional file (in Word or PDF format) that describes the investigation can be written and linked to the filled data template. The ToxBank user interface will provide a guidance document describing the sections to be included. Requesting a data upload will direct the user to a dialog for identifying the data and providing summary information.

2. Upload protocol into ToxBank



ToxBank

Sign out

J. Smith's Account >> Define protocol upload fields

Select protocol file(s)

Protocol title

Author(s)

Organization using the protocol

Access level ☐ Only authors ☐ Consortium ☒ SEURAT-1 ☐ Public ☐ Custom access

☒ The research information can be viewed when anyone searches ToxBank

Help resources

Protocol template.xls

Protocol template (2).xls

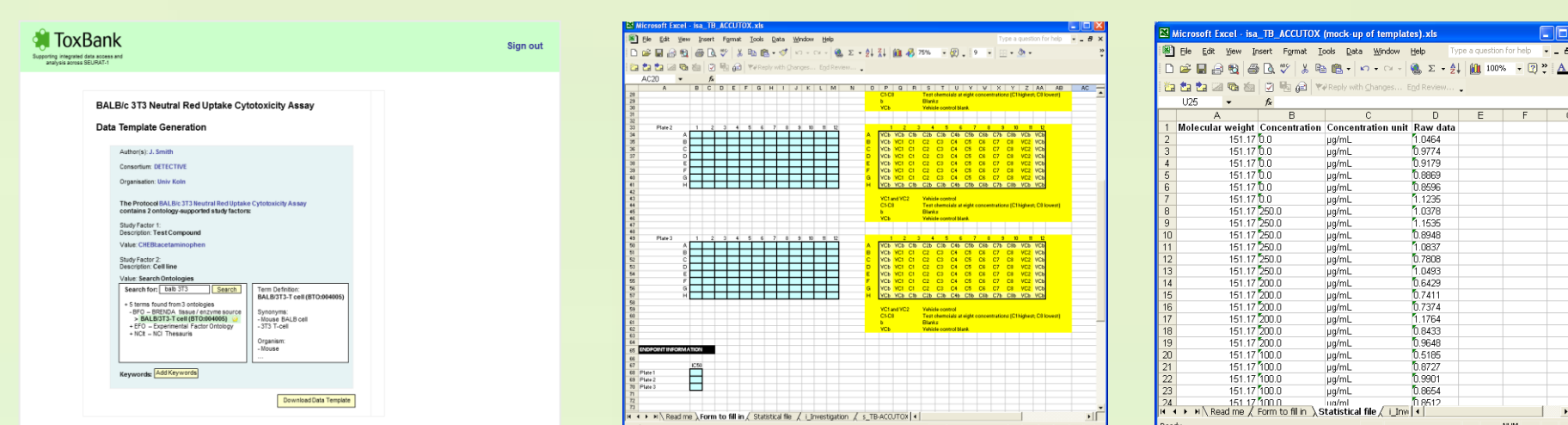
Protocol template (3).xls

Example confidentiality agreement

The research protocol or Standard Operating Procedure (SOP) will be uploaded through the ToxBank user interface where additional information will be entered and associated with the protocol.

This includes a summary of the protocol, identification of the protocol's owner, authors of the protocol, and a specification of who may have access to the protocol. In addition, keywords based on a cross-cluster keyword hierarchy, will be manually assigned to support searching.

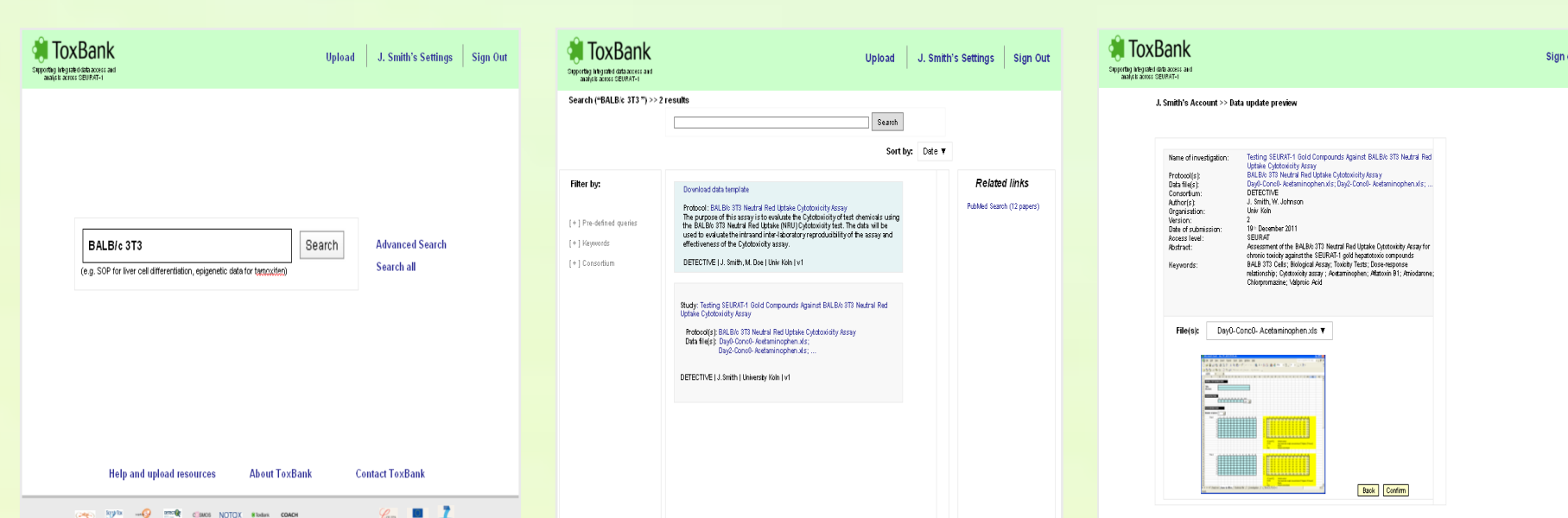
4. Download templates and enter data



Before the templates are downloaded from the ToxBank data warehouse, a dialog is presented whereby general information on the investigation is provided, including any experimental factors (such as compounds or cell lines being used). In this mock-up, a template can be downloaded that contains a number of tabs.

The first tab provides instructions on how the template should be filled. The second tab is where the results should be recorded in the defined fields. Information from this tab will populate other tabs. For example, a re-organization of the data is provided in the third tab that can be easily processed by statisticians to generate IC₅₀ and other endpoint information such as IC₁₀, IC₂₀, or LOEC. The remaining tabs correspond to ISA-TAB files and are automatically populated.

6. Searching ToxBank



The protocols and investigation data generated in the SEURAT-1 cluster, as well as related public data, will be accessible through a simple search interface. In addition, an *advanced search* and a *search all* tool are available options. The protocol or investigation data will be available directly from any result list via hyperlinks, where all summary information is presented alongside all protocols or investigation data files, which would be available for downloading.

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(Partners 1-8 = ToxBank, Partner 9 = DETECTIVE)

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