



## **What is RSpace ELN?**

RSpace is an affordable and secure enterprise grade Electronic Lab Notebook (ELN) that catalyzes research and allows organizations to enjoy the benefits, efficiencies and long-term cost savings of centralized, paperless data storage, digital lab management, IP protection and secure collaboration. RSpace ELN includes many of the features found in modern operating systems, but *in addition* acts as a multi-user, cross-platform digital hub that facilitates your Data Management Plan (DMP) or institutional Research Data Management (RDM) strategy, protecting your data with 21CFR11 compliance throughout its lifecycle from lab bench to publication or long-term archive. RSpace integrates with commercial systems like Box, Dropbox, Google Drive, and MS OneDrive and popular research tools like Mendeley, Dataverse, ORCID, Figshare and others, as well as with your existing shared SMB / SFTP file stores, archiving systems and data repositories. RSpace also integrates with other tools like Slack, MS Teams, and Google Hangouts, as well as your primary email account, your standard system calendar and the eCAT inventory / sample tracking system to provide a complete lab management solution. RSpace is extremely flexible and can be used in any sector. It works well in research, teaching and business environments, or indeed anywhere that secure and compliant collaboration, document management, content creation, group oversight and collaborative organization of files, notes, scientific data or images is required. A modern and rapidly evolving open API allows users to create additional integrations with other systems they use.

See: <https://community.researchspace.com/public/apiDocs> for API details.

The key to the system's security and collaborative features is the fact that research data is not stored on the user's local device (where it is vulnerable and insecure), but on the secure RSpace server that is optimized for efficient oversight by your IT and data curation teams. The server can be installed at your site, or on a cloud host of your choice. Alternatively you can opt to use our free public cloud server at [community.researchspace.com](https://community.researchspace.com). RSpace servers include a secure, expandable file store (where raw data files are kept in their native format) and a MySQL database that records all data transactions and ties the system together. Any HTML5 browser-equipped device can be used to create, read and edit content, including Mac, Linux and PC workstations, as well as most browser equipped smartphones and tablets. There is nothing to install for the users, they simply open a browser, log in to their institution's specific server and get to work. Licensing is based on "seats". If a user leaves your organization, the vacated seat becomes available to a new user.

For a complete description of RSpace functionality see:

<http://www.researchspace.com/enterprise/help-and-support-resources-enterprise/introduction-to-rspace-enterprise/>

For recent additions and updates to the latest version, please consult the changelog at:

<https://www.researchspace.com/help-and-support-resources/changelog/>

## Feature set details

### 0) login Window

0.1) Standard user password login and forgotten password reset option on all versions.

0.2) login with Google credentials and self signup supported on community version. Note that some login variables can be edited but the username cannot be changed once created.

### 1) Data Types and Main Interface Tabs

Data in RSpace is divided into three basic types:

1.1) **RSpace Documents** – editable content created within, or imported in to the RSpace **Workspace** tab. RSpace Documents can be standalone items organized however you like within a folder hierarchy, or can be a linear sequence of RSpace documents arranged chronologically within a **Notebook**. Within the notebook context RSpace documents are often referred to as **Entries**. RSpace Documents are designed to record and guide users’ activities, and allow for either highly structured or “stream-of-consciousness” styles that capture even the subtle nuances of users’ daily workflows and thought processes. RSpace Documents and can be shared to encourage collaboration and distributed as **Forms** and **Templates** to help make workflows more reproducible, traceable and standardized.

1.2) **Files**, which are kept in the **Gallery** tab. These typically represent data or Documents created outside of RSpace but stored within the system for convenience and to encourage efficient collaboration, compliance, searchability and traceability. Files are not directly shareable but they can be inserted into RSpace Documents where they can be annotated to make their significance clear, and then the parent Document can be shared.

1.3) **Links** are used inside Documents in the Workspace to reference resources already in RSpace or additional data located in supported external data sources that RSpace can communicate with. These data sources include commercial tools like Dropbox, Box, MS OneDrive, Egnyte and others, as well as institutional file stores and repositories, or other external data sources accessed using the open RSpace API that is available to all users.

RSpace is functionally divided into tabbed areas used for different purposes:

1.2) **Workspace** – houses hierarchically organized **RSpace Documents** (sometimes just called “Documents”) and **Notebooks** created within the system by RSpace users. Click this tab at any time to return to the top level of the Workspace hierarchy.

1.3) **Gallery** – file, **Snippet** and exported Document store.

1.4) **Messaging** – internal messaging system

1.5) **Apps** – select and configure ability to use add-on third party tools on a user-by-user basis

1.6) **My RSpace** – preferences, user profile, group management, audit tools, Forms & more

1.7) **Help** – Quick access to written and video Documentation

1.8) **System** tab – visible when logged in as admin, used for top-level configuration

- 1.8) **Account** – conceals the username from glances of passers-by and allows fast sign out.
- 1.9) Interface layout is responsive to display size and specifically designed to allow ease of use on both workstations and mobile devices. Supports both mouse click and tap / swipe actions.
- 1.10) Universal live chat help icon at bottom right allows “always on” access to live support.
- 1.11) Client specific branding logo can be added at top left.
- 1.12) The tabbed areas of the interface can be opened in new browser tabs or new browser windows to allow efficient multitasking and comparison of different resources.

## 2) Workspace

The Workspace can be thought of as the official record of work performed by each user. The Workspace includes a main tool bar and a customizable listing of RSpace Documents and containers. The number of items visible can be set to 10, 15, 30 or 50 using the dropdown at the bottom of the page and filtered or searched to show only those items currently of interest. The main toolbar includes the following functions:

- 2.1) **Create** dropdown is used to instantiate new Documents, Folders or Notebooks in the current location. Documents can be selected from recent history or from a popup list of previously created Forms or Templates. New single or batches of RSpace documents can also be created from existing MS Word documents, or RSpace documents can be created from protocols selected from the protocols.io database.
- 2.2) **Notification indicator** for system generated messages. Red count indicator indicates number of unread notifications.
- 2.3) **Message indicator** for system messages from other users. Red count indicator indicates number of unread messages.
- 2.4) **New Notification** button allows quick creation of messages to other RSpace users. PIs and LabAdmins can also send a request to create of a new collaboration group to other PIs.
- 2.5) **Create a calendar entry** allows users to make downloadable calendar files that integrate with your system calendar.
- 2.6) Switch from flat “**List View**” to “**Tree View**” of files and Documents. “Tree View” allows for easier visual navigation of complex folder hierarchies, and also allows fast direct access to items in both the Workspace AND the Gallery. List View shows only one directory at a time in the Workspace. Users can create custom folders and hierarchies. “Special” system generated folders are always visible at the top level of the workspace: “Templates” (labeled with a T) and “Shared”, (labeled with an S). List View also provides additional metadata and sorting / filtering options and is more compatible with touch screens and mobile devices than Tree View.
- 2.7) Switch between “**Folder View**” and “**View All**” list modes. View All mode shows all accessible Documents as a flat list, arranged in chronological order. This is especially useful for allowing a PI to see recent activity throughout the entire LabGroup. For this reason the View All mode is sometimes referred to as the “PI’s view” although it is available to all users.
- 2.8) **Favorites** filter. Shows only items marked as favorites. A small star icon in List View shows at a glance which items are favorites.
- 2.9) **Shared with me** filter. Shows only items that were created by someone other than the current logged in user and then manually shared with the current user.

2.10) **My Lab Group** filter. Acts as a shortcut for quick access to the current user's main shared lab folder(s). When an item is shared with colleagues, a link to the original item is placed in one of several shared folders. These links can be organized within shared folders by PIs and Lab Admins independently of the location of the original item, whose location is determined only by the owner. For PIs and **LabAdmins with View Permission** (also called **Senior LabAdmins**) the My Lab Group also includes shortcuts to the top level Workspace folder for all members of that PI's LabGroup(s). The PI can use this to quickly see work performed by researchers or students in their lab.

2.11) **Templates** filter. A shortcut to the Workspace > Templates folder. Templates can be used to instantiate new Documents using the Create > From Template command. Templates consist of an RSpace document that has already had a significant content added that the user may want to re-use. Templates can be shared with other users or LabGroups, and can be created even from documents that the current user does not own, so they can be used as a way to "capture" other people's work for the purpose of sharing it elsewhere.

2.12) More than one Workspace filter can be simultaneously activated (by clicking or tapping) to create custom views of the Workspace that limit the list displayed to a subset defined by the intersection of the selected filters.

2.13) The RSpace main search engine is based on Apache Lucene and has three main modes: a) basic or single parameter search, with the search parameter selected from a dropdown list. b) Advanced search where different parameters can be combined together to make a Boolean query. c) Lucene search, initiated by typing "l:" then using search terms connected by modifiers or logical connectors drawn from the standard lucene [Query Parser Syntax](#). RSpace indexes all text and metadata of the content created in RSpace AND the content of most common file types added to the Gallery. RSpace search includes a chemical structure search tool provided by chemaxon that allows users to locate any Document where a specific chemical structure appears.

### 3) Workspace Navigation and Metadata

3.1) The **Workspace** can contain individual RSpace Documents (usually just called Documents), Notebooks and Folders. Folders can be hierarchically nested any way the user likes and both notebooks and Documents can be moved and organized within folders. Custom icons can be assigned to different types of Documents, making it visually easy to distinguish them. Clicking a folder makes that folder the currently displayed directory.

3.2) A **Breadcrumb Trail** or "path" near the top of the page shows the current location in the hierarchy. Users can click on folders in the path to move to another directory or click the Workspace tab at any time to return to the top level of the Workspace.

3.3) Users can click the name of a **Notebook** at any time to see the listing of Documents inside as if the Notebook were a directory / folder, or can click on the Notebook icon itself to enter **Notebook View** mode. Notebook view allows sequential viewing of pages using the arrow keys, or via the left or right swipe action on mobile devices. The Notebook View also allows users to display a listing of pages arranged in sequence and allows users to quickly jump to any page.

3.4) If Notebooks need to be used to record a number of related but concurrent projects or workflows, they can be collected together into a Workspace Folder to indicate that the linear record of activities recorded in the separate notebooks are related.

3.5) In **List View**, the order of displayed items can be sorted chronologically by clicking the Creation Date or Last Modified Date column headers, or alphabetically by clicking the Name column header.

3.6) Users can click the blue “i” (**info**) button next to each item (or anywhere in RSpace that it appears) to show the info popup that displays additional information about the adjacent item. Additional information can include useful details such as a the item’s unique ID, signature status, a customizable and searchable caption, the ID of the parent “Form” on which the Document was based, the current edit status and more.

3.7) Additional icons adjacent to the Document name seen in **List View** indicate whether each item is signed and whether it is currently a **Favorite**.

3.8) The ID column shows the **Unique ID** for each item. The ID number for almost any item in RSpace can be used as a stable link to reference that item inside or outside of RSpace. To copy the link, right click or tab-hold then choose the copy link or equivalent command for your browser. Only RSpace users with the correct access permissions can see the target that the link points at.

3.9) In List View, click the name of any Document to open it in **View Mode**. Note that the **Document Toolbar** is displayed in blue at the top of the page and the Unique ID and Document-specific **info** button are also visible at the top of the page. From here the user can choose **Sign, Share, Export, Save as Template**, or can send a message and link to the Document using **Slack, MS Teams or Google Hangouts** if these have been activated in the **Apps** tab. Users can also click the envelope icon to send an RSpace notification related to the Document to themselves or other users and can include configurable calendar files in these notifications if the “**Review Document**” option is selected. Click the **X** icon to return to the workspace.

#### 4) Contextual Action Menu

4.0) When in list view, the items in the Workspace can be selected using the checkboxes on the left of the interface. A master select all / deselect all checkbox is located in the top row of the list. Checkboxes can be selected by clicking (workstation) or tapping (touchscreen device).

4.1) When one or more items in the Workspace are selected, the contextual action menu appears near the top of the interface. Only appropriate action buttons are displayed based on the properties of the selected items. Not all actions can be performed on all sorts of items, some actions (e.g. **Revisions**) are only displayed when a single item is selected.

4.2) **Duplicate** makes a copy of the selected item. The word “copy” is appended to the item name.

4.3) **Move** allows the selected item to be moved to a new location. Not all items can be moved to all locations, for example, items cannot be moved to the Shared Folder or Templates folder, and only PIs and Lab-Admins can move items around and organize them in the LabGroup shared folder. These rules help to bring order and structure to shared resources of different types.

4.4) **Rename** renames the item. Note that the original name is retained in the revision history.

4.5) **Delete** deletes the item so that it is no longer visible in the Workspace. Deleted items still exist in the system and can be restored from **My RSpace > Deleted Items**.

4.6) **Export** opens the universal RSpace export dialog, which can also be accessed elsewhere in the system. See details in **Export and Import** section below. Note that if the user initiates a search in the Workspace the search results can be exported as a single bundle.

4.7) **Revisions** displays a list of all versions of the selected Document arranged chronologically. Versions can be searched, viewed or restored to make a past version the new current version.

4.8) **Add to Favorites** allows users to designate the selected Document(s) as favorites (similar to “bookmarks” as they are known in some browsers). A small star next to an item denotes that it is a favorite. A list of current favorites can be viewed by clicking the favorites filter in the workspace toolbar. If an item is already a favorite, this action automatically changes to “Remove from Favorites”.

4.9) **Share** opens the Share dialog which allows the owner to choose which LabGroups or individuals to share the selected Document(s) with and also allows the owner to set sharing permissions and optionally select an existing destination subfolder or Notebook within the share folder. Note that the share action generates links to the original item and these links, located within shared folders, can be organized by PIs and LabAdmins in ways that do not affect the location of the original item.

4.10) If the **Slack** app is enabled in the apps tab then the **Send to Slack** button will embed links to the selected Document(s) in a new Slack message.

4.11) If the **MS Teams** app is enabled in the apps tab then the **Send to MS Teams** button will embed links to the selected Document(s) in a new MS Teams message.

## 5) Gallery

The RSpace **Gallery** is analogous to the hard drive of a computer. It acts as a storage area for images, Documents and data files in any format or from any source. Files in the Gallery may or may not appear in the Workspace, and therefore users can think of files stored here as being semi-formal, and not necessarily something they want included in the official record of their work. Items imported to the Gallery reside on the RSpace server as physical copies. Gallery files cannot be shared directly with other users, but links to Gallery files can be inserted into RSpace Documents in the Workspace, and when those Documents are shared with other users, the links to files in the sharing user’s Gallery automatically enable access to the linked file for any user who the parent Document is shared with. Gallery files are not accessible to other users, but are accessible to the user’s PI, who can access them from the RSpace Tree View in the Workspace by looking inside the Shared > LabGroup > [Username] > [Username’s] Gallery folder.

5.1) Click the **Gallery** tab to go to the Gallery or right-click to chose your browser’s command to open the Gallery in a new tab or window.

5.2) Files in the Gallery are automatically organized into Gallery sections based on file type. The sections are: **Images** (.jpg, .tif, .png etc), **Video** (.mp4, .mov, .wmv etc), **Audio** (.mp3, .wav etc) **Documents** (.doc, .xls, .pdf, .txt, .ppt, .rtf etc) and **Miscellaneous Files** (all other file extensions). There are also additional areas in the Gallery for RSpace **Exports** (RSpace Documents that have been exported as .pdf and .doc files), **Snippets** (small pieces of reusable RSpace Document content) and an area for configuring and browsing remote SMB and SFTP file stores to which the user has access.

5.3) Select an area of the Gallery by clicking one of the icons on the left or by clicking on the **Choose Gallery** button and selecting from the dropdown menu.

5.4) Drag and drop import of multiple items is supported, or click **Import** to access the standard file chooser, mobile device photo capture or image importer for internet images / box / dropbox / MS OneDrive files. These all ingest physical copies of (not links to) files that are then stored in the appropriate Gallery section.

5.5) Buttons at the top of the Gallery allow sorting of items by name or date. A text field allows filtering of the currently displayed gallery folder to show a selected sub-set of items. New folders can be created to allow hierarchic organization.

5.6) Select an item in the Gallery using its checkbox to reveal a contextual action menu. Available actions are similar to those in the Workspace but also include some that are unique to files in that Gallery section (e.g. "Rotate") for image files. Note that multiple files can be selected in the Gallery then exported as a single bundled .ZIP file using the Export action.

5.7) Click or tap the blue "i" **Info** icon to show the file's metadata in the right hand **info panel**. The info panel includes the **Unique ID** of the item (which when copied yields a stable link to the file) as well as the ability to add searchable captions. There are also additional buttons to allow **View** or **Download** of the file. If a newer version exists outside of RSpace, the "**Upload new version**" button can be used to select and upload the new version, overwriting the existing file (which is NOT however deleted from the system). A version number indicator is added to the new file too. For images, click or tap the any file icon to enter **Gallery Mode**, which allows high-resolution sequential viewing of images. **Show linked docs** allows users to see a listing of all Workspace Documents within which the selected file is referenced. This is extremely useful for helping with data traceability and investigation of data usage patterns.

5.8) For images, Documents and snippets, click or tap the file preview in the Gallery to see a larger preview. For Documents, click **View** (in the info panel) to see a full resolution version in a new browser tab. For **Miscellaneous Files** and multimedia files, click the file icon to download a copy of the file that can then be opened using the default application on the user's local device.

5.9) Organization of Gallery files can be done by selecting items and choosing **Move** from the action menu. Drag and drop of files into existing Gallery sub-folders is also supported.

5.10) For convenience and improved performance, the Gallery is paginated with up to 20 items visible on each page. Users can navigate between pages using the page numbers at the top of the page, or filter the current view using the file name text filter at the top of the page.

5.11) Items in the **Exports Gallery** can be published to make them available to anyone who has access to the network location of the RSpace server, even if they do not have an RSpace account. To publish an exported item, click the item's checkbox then click **Publish** in the action menu to generate a stable link. The link can be sent to anyone. Published links expire automatically after a period of time that can be configured on the server by your System Admin.

## 6) The RSpace Text Editor and RSpace Document Creation.

6.1) The **RSpace Text Editor** is a flexible content authoring tool with a range of standard text editing features as well as a number of specialized content creation tools that will be of particular use to scientists and academics. Some of the special tools can be activated or deactivated on a user-by-user basis from the **Apps** tab in order to limit the number of icons

displayed in the Text Editor toolbar. The Text Editor toolbar can also be customized using **File** menu > **Configure Toolbar** and custom Keyboard shortcuts can be created from **File** menu > **Shortcuts**.

RSpace Documents are based on **Forms**. Each form consists of any number of **Fields** into which content can be inserted. There are several types of Field available, but the most common is the **Text Field**, which is edited by the RSpace Text Editor. The most frequently used Document type in RSpace is the RSpace **Basic Document** which can be created using **Create > From Form > Basic Document**. A Basic Document consists of a single Text Field, but other Document types may contain any number of Text Fields as well as other types of Fields.

6.2) To edit the text field(s) within an RSpace Document, Click the name of the Document in the Workspace List View or select the Document in Tree View. The Document initially opens in **View** mode. Note that the **Document Toolbar** is displayed in blue at the top of the page and the Unique ID and Document specific **info** button are also visible at the top right of the page.

6.3) A responsive **Document Tree** is available for display on the left and is opened by clicking the blue **Tree View Tab** at the top left corner. The tree automatically hides if the page is too narrow to display, and can also be manually collapsed at any time by clicking the blue collapse tab. The **Document Tree** automatically highlights the current document being viewed, showing its location within the total document / folder / notebook hierarchy of the system. The **Document Tree** can be used to navigate to other documents or to create links to other documents using drag and drop.

6.4) Double click or tap anywhere inside any Text Field you want to edit. If the current document is a **Basic Document** then there is only one text field. The Text Field switches to **Edit** mode and the **RSpace Text Editor Toolbar** appears. To Cancel editing, click **Cancel** at the top of the interface or click the **X** in the toolbar to return to the Workspace.

6.5) RSpace allows users to create new Documents quickly and conveniently from external .doc, .docx or .txt files by clicking **Create > From MSWord**. This converts the file into an RSpace Basic Document consisting of a single text field that can now be edited with the RSpace Text Editor.

6.6) The **RSpace Text Editor Toolbar** includes three rows of icons. For most functions there are also equivalent dropdown menu commands, and in many cases keyboard shortcuts.

The first row of icons in the Text Editor Toolbar comprise mainly of industry standard editing tools and many industry standard key commands (e.g. copy and paste etc.) are supported. The widely used and no-doubt familiar features of the first row of toolbar icons will not be discussed here.

6.7) The second row of the toolbar includes icons that allow insertion of files, tables (with additional discussion [here](#)), internet links, comments, sketches, formatted computer code examples and more.

6.8) **Comment Box** that allows threaded discussions between users who have access to the current Document.

6.9) **Internal Links** to other RSpace Documents.

6.10) The RSpace **Sketch Tool** that allows freehand drawing and annotation of images dragged to the Document or inserted from the Gallery. The Sketch Tool can also be used to select, adjust and annotate images directly from the top hierarchic level of the RSpace Image Gallery using the icon at the top right of the sketch tool. This allows the image to be suitably positioned on the sketch canvas, re-sized and annotated *before* it is added to the Document.

6.11) The **LaTeX Equation Editor** takes LaTeX code and renders it as visually appealing equations and expressions.

6.12) The **Snippet** creation tool. Select some content within the current text field and click the Snippet button to convert that content into a re-usable piece of named content that will be stored in the Snippet area of the gallery. Think of this feature as adding a flexible multi-clipboard to RSpace.

6.13) **Insert From Gallery**. Selects a file from the Gallery that is inserted as a link. When appropriate the link includes access to small, medium and full size previews of the inserted file. For some files, additional functions are available when the inserted file is selected in Edit mode. (e.g resizing of images, or click the **info** button to access the **Download** or **Replace** (with new version) function for inserted Documents). In the case of images, double clicking the preview opens the image in the RSpace Sketch tool. **Insert From Gallery** can also be used to locate and insert a selected **Snippet**, or to select a file from an approved external SMB or SFTP filestore, then add a Link to that file within the Document.

6.14) **Import File** (from local computer or mobile device). Selects a file from outside RSpace for insertion. An internal link is inserted into the Document and a copy of the file is also added to the appropriate Gallery section where it is now available for use elsewhere if needed. Note that **drag and drop** addition of any file in any format from the user's local computer directly to RSpace Documents is also supported. Again, a copy of the file that was dragged to the Document is stored in the appropriate Gallery section. RSpace detects if the user is using a mobile device and offers additional options and minor changes to the import workflow that accommodate the mobile device's ability to take photographs and capture voice notes.

6.15) RSpace includes a number of useful **Science Tools** and **Online Tools** organized under two dropdown menus in the Text Editor toolbar. These can be used for performing common calculations often used in science laboratories.

Optional "add on" tools in the second row of text editor icons allow the following:

6.16) Insert link to file in **Dropbox**.

6.17) Insert link to file in **Box**.

6.18) Insert link to file in **MS OneDrive**.

6.19) Insert link to file in **Google Drive**.

6.20) Insert link to file in **Mendeley**.

6.21) Create and insert or edit a chemical structure using **Marvin by Chemaxon**.

6.22) Insert link to a sample, container or set of search results from the **eCAT sample tracking system**.

6.23) Note that links to items that reside outside of RSpace are represented with a dotted line border, and links to items that reside on the RSpace server are represented with a solid line border.

6.24) The RSpace **Autosave** feature saves text created in text fields as the user works.

6.25) The **Save** menu in the Document toolbar includes several options for sequentially saving work and then determining the next action in the user's workflow. Clicking **Save** manually creates a new revision of the Document that can be seen in the **Document Revision History**, but the Document stays in **Edit** mode to allow additional editing. **Save and Close** Saves the work, closes the current Document, and returns the user to the workspace. **Save and View** saves the work and switches the Document into view mode. **Save and Clone** saves and closes

the current Document, creates a copy, and then opens the copy for further editing. **Save and New** closes the current Document and creates a new empty Document based on the same Form as the previous Document. The last two options can be useful when using RSpace to record the details of a repetitive sequence of similar or identical workflows.

6.26) The procedure for creating and editing standalone RSpace Documents that can be organized into Folders, and the creation of RSpace Documents that represent **Entries** (also called pages) in an RSpace Notebook is essentially identical, but note that Documents cannot be moved out of a Notebook, nor can they be hierarchically organized there. The RSpace Notebook is specifically designed to represent a linear record of work performed with Entries arranged strictly in chronological order. Other users may contribute pages to a Notebook, but Notebooks always have a single primary owner. Only the Notebook owner can create new Notebook pages in-situ directly within the Notebook.

6.27) At the top of any open Document is an area where **Tags** can be added to make the Document more easily searchable. Tags offer autocomplete options as they are typed, with a dropdown list showing any matching Tags.

6.28) The Document **Name** can also be edited directly where it appears at the top of the Document without needing to enter Document edit mode first.

6.29) Click the paperclip icon at the bottom of the Document to reveal a list of attached files. The list includes both RSpace Gallery files and links to files in external storage volumes.

6.30) Additional editing functions not shown as icons in the tool bar are available from the dropdown menus of the text editing tool or may be available in the **File** menu > **Configure Toolbar** area. These include less frequently used elements like special characters, time and date stamps, specialized scientific calculation tools and more. Watch for new editing tools that may be added to the toolbar with each new RSpace update. Check the changelog with each release for details at: <https://www.researchspace.com/help-and-support-resources/changelog/>

## 7) Forms and Templates

**Forms** and **Templates** allow users to create and distribute workflows, procedures or guides that help make research more reproducible and can standardize activities and data capture across a lab or organization.

7.1) Any Document that users currently have access to can be turned into a reusable Template that can be shared with others. To create a Template from an existing Document, open the Document and choose **Save As Template** from the Document toolbar. The Template is created in the Templates folder, which is located in the Workspace. A shortcut to this folder is located in the Workspace Toolbar. To create a new Document based on a Template Click **Create > From Template**, then select the correct template from the popup list. Templates can be shared with other users or entire LabGroups by selecting the Template in the workspace and clicking **Share** in the action menu.

7.2) **Forms** (also called Structured Documents) consist of a list of **Fields** that may or may not contain any content. A small set of example Forms is included with all RSpace deployments, the simplest of which is the **Basic Document** Form, which includes a single Text Field. Users can create custom forms by clicking on **My RSpace** tab > **Create Form**. Think of forms as basic

scaffolds for your Documents that define their structure and can act as a sequential checklist for actions performed and data that must be collected. Once a form has been created and content has been added to the fields in a form, the resulting Document can be saved as a template. Forms are created by clicking **Create > From Form**. Forms can be subsequently edited and managed in the **My RSpace > Manage forms** area.

7.3) Field types that can be included in a Form include **Text Fields, Numbers, Character Strings, Check Box field, Radio Button Fields, Date and Time Fields**. Validation checks can be included to make sure that entered data falls within some expected range, and the sequential order of the fields within the Form can be adjusted.

7.4) As an aid to data traceability, all Forms have a unique identifier (ID). When an RSpace Document is created from a Form, the Document has its own unique identifier, but the ID of the parent form is also associated with that Document. These 2 ID numbers are visible in the **info** popup window. This means that when a user searches for the unique identifier of the parent Form in the main Workspace search tool, the list of results will include ALL examples of the Document type that were based on the specified parent Form and to which the searching user currently has access.

## 8) Messaging and Notifications

RSpace features an internal messaging system that allows communication between users and allows the system to send notifications to users as needed. **Messages** (from users) and **Notifications** (from the system) can be viewed and marked as read in the **Messages** tab. Red counter icons at the top of the interface indicate the number of unread messages and notifications. The system can be personalized by each user to send mirrored emails to the user's registered email address in **the My RSpace > My Profile** area.

Messages to other user(s) can be created by clicking on the envelope icon wherever it appears. There are three types of messages:

8.1) **Basic messages**. These are text sent to a named user or users. Links to resources can be copied and pasted into these messages.

8.2) **Create a Collaboration Group** request. These are messages that can be sent only from one **Principal Investigator (PI)** to another and are used to initiate collaboration between different LabGroups.

8.3) **Review Record** messages must be sent from the Document toolbar of an open Document. They can be used to send text and standard .ics calendar files with dates and times to other users, or as a reminder to yourself. This is a good way to integrate RSpace with your existing system calendar.

8.4) RSpace supports the use of "**Mentions**" to alert users that there is something they may need to look at. To use this feature, first select a document that has been shared with one or more users, then type "**@**". RSpace will automatically populate a dropdown list of other users who have access to the current document. Choose a user to send an alert to that person as an RSpace message.

8.5) Messages can also be sent to users with SLACK, MS Teams or Google Chat if those features are enabled on your server.

## 9) Apps tab

This is where external Apps can be configured on a user-by-user basis. When Apps are activated in the Apps tab, a new icon for that app will appear in the RSpace Text Editor. The ability to use the various Apps can also be turned on and off system wide by the system administrator. New apps integrations are constantly created by ResearchSpace, but as of Q1 of 2019 the list includes:

Protocols.io	Chemaxon tools	Egnyte
Dropbox	Box	Evernote
MS OneDrive	Google Drive	Slack
MS Teams	Google Hangouts Chat	Mendeley
Dataverse	Github	Figshare
eCAT (sample tracking)	Owncloud	Dspace

## 10) My RSpace tab.

This area serves as a dashboard and control panel for users and PIs.

10.1) If the user has been designated as a PI by the system administrator, then the first panel of the **My RSpace** tab area will be the **My LabGroup** panel. This area allows PIs to see a listing of the members of their lab, allows fast access to the workspace of each lab member and allows PIs to manage of Lab membership and Lab Member Roles. The PI can also write a description of the LabGroup's research interests here that will be visible in the server-wide **Directory**.

10.2) In the My LabGroup area, PIs can promote trusted senior lab members to **Lab Admins** or **Senior Lab Admins** with the ability to oversee the work of other lab members.

10.3) From the My LabGroup area, PIs can easily export the entire LabGroup's work, i.e all Documents and all files created by all members of the LabGroup.

10.4) The **My Profile** area allows users to change their password or (if allowed on that server) there email address. Note that for compliance reasons, usernames cannot be changed.

10.5) The My Profile area can also be used to configure the user's **ORCID ID** which can be used to connect to the user's research portfolio and link the user irrefutably to work they have exported from RSpace.

10.6) A custom image and short description of the users work can be added here.

10.7) Access to the RSpace API can be setup here and links lead to extensive API documentation hosted by Swagger and Github.

10.8) Notification settings can also be configured here.

10.9) On Enterprise servers, the **Directory** can be used to see a listing of all users, LabGroups and PIs. On the Community server, users can opt out of appearing in the directory.

10.10) The **Create Form** and **Manage Forms** area are accessible here. The process of creating and managing RSpace forms is described elsewhere.

10.11) In a 21CFR11 compliant system like RSpace, nothing is ever really deleted from the system. All deleted items for a given area reside in the **Deleted Items** area. This area can be searched and items that were previously deleted can be located, viewed and if necessary restored back to the Workspace.

10.12) The **Shared Documents** panel allows users to see a list of all Documents that they are currently sharing with other users. This is useful because with the passage of time it is easy to forget what you have shared with other individuals and groups. It's a good idea for users to visit this panel from time to time to adjust permissions or access to Documents as necessary.

10.13) An important requirement of 21CFR11 is a full audit trail of user activity within the system. The **Auditing** panel allows standard users to see their own audit trail. PIs can see the history of all activity in their lab, Community Admins can see the activity of all users in their community (i.e. a section, or department, college or other internal division) and the system admin can see the activity of everyone on the server. The audit trail can be filtered to show only specific activities or users, and unique Identifiers with live links to the specific related resources are associated with most audit trail actions.

10.14) The **Export – Import** panel is where bulk export of a user's entire data set can be exported using the universal RSpace export dialog box.

If data is exported in .xml format, the downloaded .zip bundle containing the .xml files can then be selected and reimported back into any other RSpace server using the **Import** button in this panel.

**11) Help** tab is where users can access written Documentation, video segments illustrating most aspects of functionality, and also the changelog link that describes new features in RSpace as they are released. <https://www.researchspace.com/help-and-support-resources/changelog/>

## **12) Permissions and Roles**

RSpace has been designed with highly scalable, hierarchic, delegated administration, support and oversight in mind. There are several different user and administrator roles to help facilitate this. The permissions and roles have been designed to facilitate the structure of typical academic labs, but can easily be adapted for the commercial world. In general, and especially for RSpace Enterprise servers, the roles of most users are determined by the **System Administrator (Sysadmin)** during the initial setup of the server. The Sysadmin is responsible for organizing users into LabGroups, designating initial PIs, organizing LabGroups into communities, designating Community Admins to lead those groups and creating any additional System Admins that may be needed. Additional Sysadmin functions are available in the **System** tab.

12.1) **Standard Users** or just "users" for short can use RSpace in isolation but typically are arranged into LabGroups. Users cannot see or edit each other's work by default unless they specifically share that work with other users in the same LabGroup. Thus, in order to be able to share anything, a user must belong to at least one LabGroup.

12.2) **Principal Investigators** or **PIs**. Each lab is led by a PI. The PI can add and remove users from the LabGroup and promote users in their LabGroup to the role of **Labadmin** or **Senior LabAdmin** (with access to work by other users in the lab). The PI can also move and organize work in the LabGroup's main shared folder, see the work of all lab members, see the audit trail

for the lab and export ALL lab work at any time. If the system admin has allowed it, the PI can also choose the option to EDIT all work performed by any member of the lab. Note that the system audit trail records exactly who is responsible for all edits and all versions of past work are retained. If a PI wishes to allow users in their lab to collaborate with users in some other lab, they can send a special type of message to the PI of the other lab to create a new

### **Collaboration Group.**

12.3) **LabAdmins** can organize work in the main shared LabGroup's folder and add and remove users to the lab.

12.4) **Senior LabAdmins** have the additional ability to see, and if allowed by the Sysadmin, edit the work of all users in the LabGroup. Note that the system audit trail records exactly who is responsible for all edits and all versions of past work are retained.

12.5) Although the PI can see (or if allowed, edit) the work of all users in their LabGroup by default, the users cannot see each other's work nor the work of their PI unless that work is explicitly shared with them or their lab by the owner of the work. For systems where the PI or Senior LabAdmin only have read access by default, users can still manually override the default and offer edit permission to their PI by manually sharing the work with the PI and selecting edit permission in the sharing dialog box.

12.6) If a LabGroup contains members who are PIs in other Labgroups, then as a professional courtesy, PIs cannot see another PI's work by default, although they can choose to manually share it as appropriate.

12.7) The Sysadmin can access special management and support features in the **System** tab. These include tools to setup and edit the membership of users, LabGroups and Communities, as well as tools for overseeing server performance, data usage, bulk export, universal search and the **Operate As** option, which can be used to log in on behalf of any user for support / password reset / oversight purposes. The Sysadmin also has the capability to search all content on the server and to view the total audit trail showing the activity of all users.

12.8) The Sysadmin has the ability to designate Communities made up of collections of LabGroups, and can assign a Community admin to oversee that community. Community admins have access to most of the functions described in 12.7 including the **Operate As** feature, but only for users and groups that are part of their designated community.

**13) Sharing** in RSpace is accomplished by clicking on the **Share** button located in the Document tool bar of a specific Document, or by selecting any number of Documents in the Workspace and clicking **Share** in the contextual action menu. The sharing dialog box then appears.

13.1) Users can choose to share work with any LabGroup or Collaboration Group they belong to, or with any individual or number of individuals they share a group membership with.

13.2) Users can manually set the permission to **Read** or **Edit**, can choose to share selected Documents into specific target Folders or Notebooks, and can create NEW folders to share items into if they wish. Note that when Documents are shared into a Notebook, they appear within the linear sequence of notebook pages and their position in that sequence reflects the chronological date of their creation relative to other pages in the same Notebook.

13.3) Notebooks can be shared, and users may then contribute to a shared notebook by **Sharing into** that notebook, but only the primary notebook owner can create new pages in-situ within that notebook.

13.4) In order to keep RSpace permissions manageable and coherent, and to prevent the creation of “infinite loops” of shared items, it is not currently possible to share entire Workspace or Gallery Folders. However, specific folders can be referenced by copy-pasting the unique ID of the folder into shared Documents and Documents can be created that contain links to any number of other Documents or to any number of Gallery files or Unique IDs for folders, and then those Documents can be shared.

13.5) When a document is shared, a link to that document is created inside the appropriate sub-folder of the main **Shared Folder**. The main Shared Folder is marked with an “S” and is always located in the top level of the Workspace. Shared items can be located by tunneling down to the appropriate folder inside the main Shared Folder.

13.6) Shortcut to the user’s main Shared Folders and to a list of items shared with the current user by others are located in the main Workspace toolbar.

## 14) Digital signatures

Digital signatures are an important part of 21CFR11 compliance and are used to lock Documents so that they cannot be altered and to verify that the Document has not been altered in any way after it was signed. This can be an important legal protection of you and your lab’s intellectual property.

14.1) To sign a Document, open it and click **Sign** in the Document toolbar. The **Sign Document** dialog appears. Users can now choose to sign the document and ask for one or more witnesses selected from the list of users who currently have access to the document. If there are no potential witnesses in the list, close the dialog box to go back to the document, then share it with selected users and again click Sign to re-open the Sign Document dialog.

14.2) If no witnesses are required, the signing user can choose the second option to sign the document without witnesses.

14.3) At any time, users can click the **Show** link associated with the signing statement at the bottom of the page. From here the document can be verified as unchanged since the time of signing.

14.4) Upon signing a SHA is generated and special download versions of the document are created that can be exported, then verified as “unchanged since signing”, even outside of RSpace.

14.5) Once a Document has been signed it can no longer be edited. A special indicator is placed next to the Document in the Workspace List View and at the top of the document itself, and the **info** popup also indicates that the document is signed.

14.6) If modifications need to be made to a signed Document, it can be copied using the action menu to make a new unsigned, editable copy.

## 15) Export and Import

RSpace features best-in-industry export features with a range of flexible options that make it easy to export individual RSpace Documents, selected bundles of data or the entire datasets of

LabGroups or individuals. Additionally RSpace allows users to send data to selected archives and repositories.

15.1) To export a Document select in in the Workspace and click **Export** in the Workspace action menu or open the Document in view mode and click **Export**. The universal Export dialog box appears. The Export Dialog box looks the same and offers most of the same options regardless of the volume or type of data that the user is trying to export.

15.2) Single documents can be exported as .pdf files, or .doc files, which are deposited in the **Exports** area of the Gallery. From there the exported file can be viewed, downloaded or published. Note that RSpace Documents can also usually printed using the built-in print command of most browsers, so if the user wants to print an RSpace Document, it is usually not necessary to export it first. Single Documents can also be exported as .html, or .xml. For the latter two options, the download is prepared in the background as a .zip bundle and a download link is sent to the user inside an RSpace Notification when the download is ready. Click the link in the Notification to download the .zip bundle. The preparation of the download and associated link might take anywhere from a couple of seconds to several hours if the download bundle is very large. Multiple selected Documents cannot be exported as .doc files and collections of data that include Gallery files cannot be exported as .pdf files, so not all export options are available for all data exports.

15.3) Export as .html produces a .zip bundle which, when unpacked, yields a hierarchically organized collection of resources organized just as the resources were in RSpace. Click the **index.html** file to browse the exported data with any browser. The export includes all RSpace Documents selected for download plus any attached files in their original format. When initiating the .html export, users also have the option to follow RSpace internal links made with **Internal Link Tool** of the **RSpace Text Editor** such that the export can include the original RSpace Documents and also any other associated Documents. Links to external files kept in SMB or SFTP file stores can also be used to pull in and bundle files kept outside of RSpace at the time of export, such that they are included in the downloadable .ZIP bundle.

15.4) Export as .xml produces a .zip bundle that can be easily archived or re-imported back into other RSpace servers using **My RSpace > Export – Import > Choose File > Import**

15.5) Users have the option when exporting to choose **Export to a Repository**, which if selected, opens the **Repository Deposit** dialog. This is used to select a repository and add any required metadata that will make the exported work more searchable.

15.6) RSpace includes support for export to several popular repositories including **Dataverse**, **Figshare** and **DSpace** but also includes the capability to be quickly custom connected to other repositories.

15.7) The RSpace API can also be used to connect the export functionality to other external systems and a built-in scheduling mechanism allows for the automated export of data as a supplemental backup system.

15.8) Metadata automatically embedded in exported Documents includes RSpace Unique IDs and optional individual ORCID identifiers. This allows excellent traceability of data after it has left the RSpace system.

