

**MecCog**

**A framework for representing  
Disease Mechanisms**

<http://www.meccog.org>

**Tutorial**

**Last Update: 08/09/2018**

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## I. About MecCog

**MecCog** is a web-based framework for describing biological mechanisms based on emerging concepts in the philosophy of biology. The framework is implemented in a web infrastructure that uses contemporary methods of computational biology to represent mechanism in a computable form. The initial implementation focuses on capturing mechanisms relating genetic variants to disease phenotypes.

MecCog is hosted at <http://www.meccog.org>

## II. Getting Started

### Registration / Sign-In

New MecCog users are required to register in the website.



Clicking on the “Sign Up” button opens the registration form.

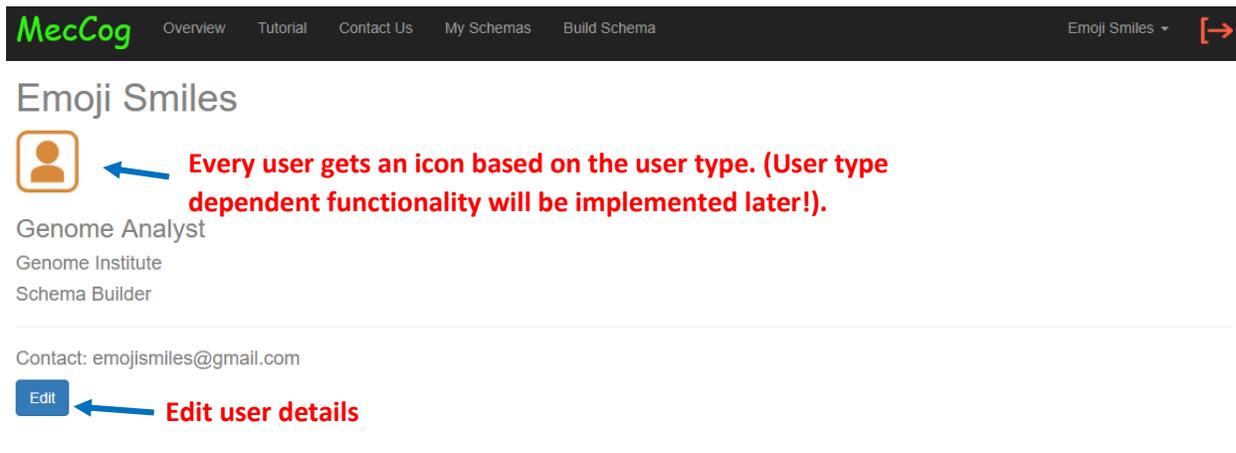
After filling in the form, clicking on “Create Account” will successfully register a user.

Existing users can sign in by filling in the Username and Password form on the top right of the menu bar followed by clicking on the login icon next to the form.

A screenshot of the 'Register' form. The form is titled 'Register' and contains several input fields: 'First Name', 'Last Name', 'Email', 'Username', 'Password', 'Password confirmation', 'Affiliation', 'ORCID ID', 'Select the Status', and 'Select the Role'. At the bottom, there is a checkbox for 'I'm not a robot' next to a reCAPTCHA logo. A blue 'Create Account' button is at the bottom of the form. A blue arrow from the 'Sign Up' button in the previous image points to the top of this form.

### View or Edit Profile

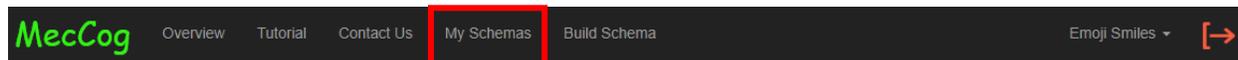
Upon successful registration or log in users are taken to the profile page where they can view and edit their information. A typical profile page looks like the following –



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## My Workspace

Workspace is the place where users will manage the mechanism schemas. Upon successful log in, users will have access to their private workspace under the sections “*My Schemas*” as shown in the menu bar.



The *My Schemas* section has three sub-sections –

1. Unpublished Mechanism Schemas – Place where all the user’s private schemas appear. The private schemas are the ones that a user is working on and have not been released for public viewing.
2. Published Mechanism Schemas – Place where all the user’s public schemas appear. These schemas will appear in the home page of MecCog website for public viewing.
3. Shared Mechanism Schemas – Place where schemas shared by another user appears. The schema details such as schema name, and schema owner are display in this part.

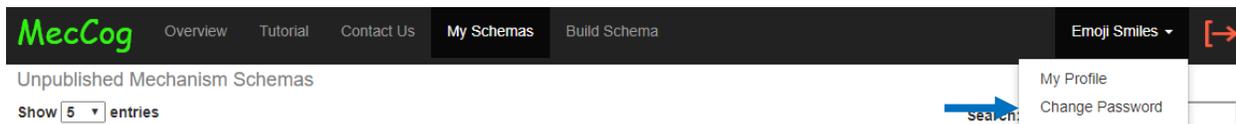
All the three sub-sections can be searched using the search box on the right and can also be sorted by column.

A view of the My Schema section is –

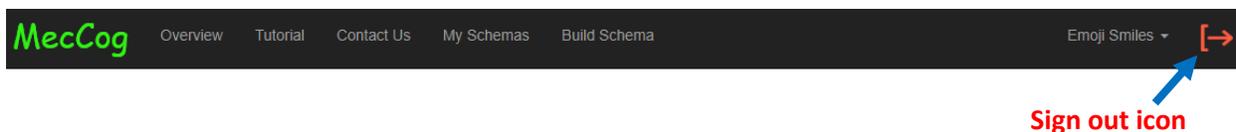
A screenshot of the 'My Schemas' section in the MecCog application. The navigation bar at the top is the same as in the previous image, with 'My Schemas' highlighted. Below the navigation bar, the page is divided into three sub-sections, each with a red heading: 'Sub Section 1' (Unpublished Mechanism Schemas), 'Sub Section 2' (Published Mechanism Schemas), and 'Sub Section 3' (Shared Mechanism Schemas). Each sub-section contains a search box, a 'Show 5 entries' dropdown, and a table with columns for Accession, Schema Name, Gene(s), Author(s), and LastModified. All three tables currently display 'No data available in table' and 'Showing 0 to 0 of 0 entries'.

## Change Password

The password can be changed by clicking a link on the right as show in the figure –

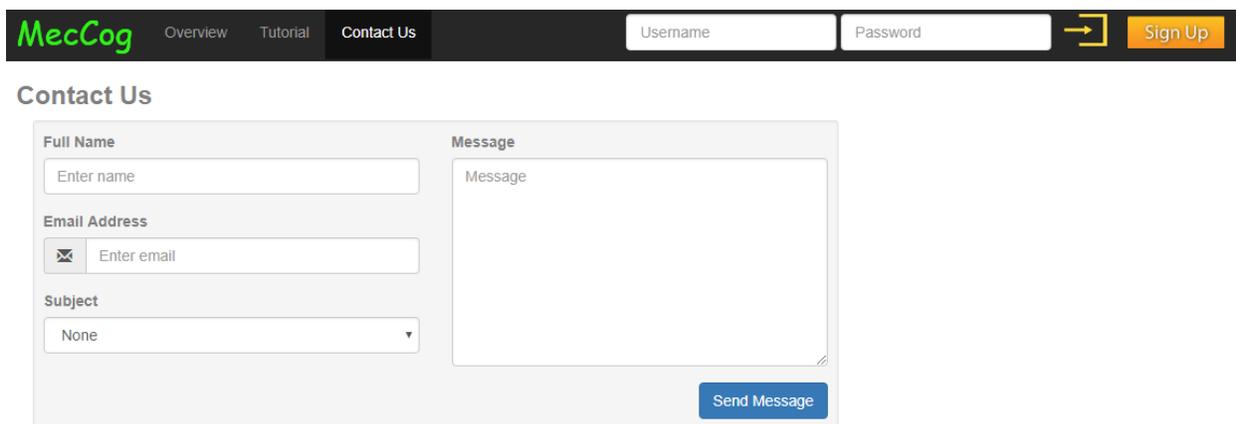


## Sign-Out



## Contact Us

Users can contact MecCog Project PI and developers for suggestions, problems, and collaborations using a web form as shown below.

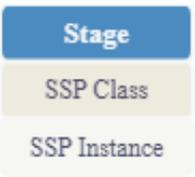
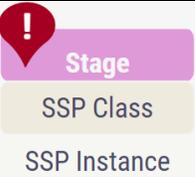


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### III. Building Mechanism Schemas

#### Introduction to Mechanism Components

There are six types of mechanism components in the MecCog system –

Component Name	Component Notation	Description
Sub-State Perturbation (SSP)		Notation of a sub-state perturbation (SSP) component represents three types of information – 1. Stage it belongs to. 2. SSP class name and 3. SSP instance name. The framework provides eight stages – DNA, RNA, Protein, Complex, Cell, Tissue, Organ and Phenotype. For each stage, SSP class names have been manually curated. Based on the type of SSP class, an instance can be annotated.
Biomarker		Notation of a Biomarker component represents three types of information – 1. Stage it belongs to. 2. Biomarker class name and 3. Biomarker instance name. The framework provides eight stages – DNA, RNA, Protein, Complex, Cell, Tissue, Organ and Phenotype.
Mechanism Module (MM)		The graphical notation of a mechanism module (MM) component represents two types of information – 1. Mechanism module class name, 2. An optional Mechanism Module Instance name. 24 mechanism module class names have been manually curated that either operate within a stage or produce a stage transition. This list will be updated as the project progresses.
Unknown Mechanism Module		For a case, where a mechanism is known to link two substate perturbations but its class is unknown, a black oval represents it.
Hypothetical Mechanism Module		For a case of a hypothetical mechanism linking two substate perturbations, a black oval with a question mark represents it.
Therapeutic Intervention		For a putative or known therapeutic intervention site, a blue octagon represents it.
Environmental Factor		For an environmental factor that affects disease risk, a mokko shape represents it.

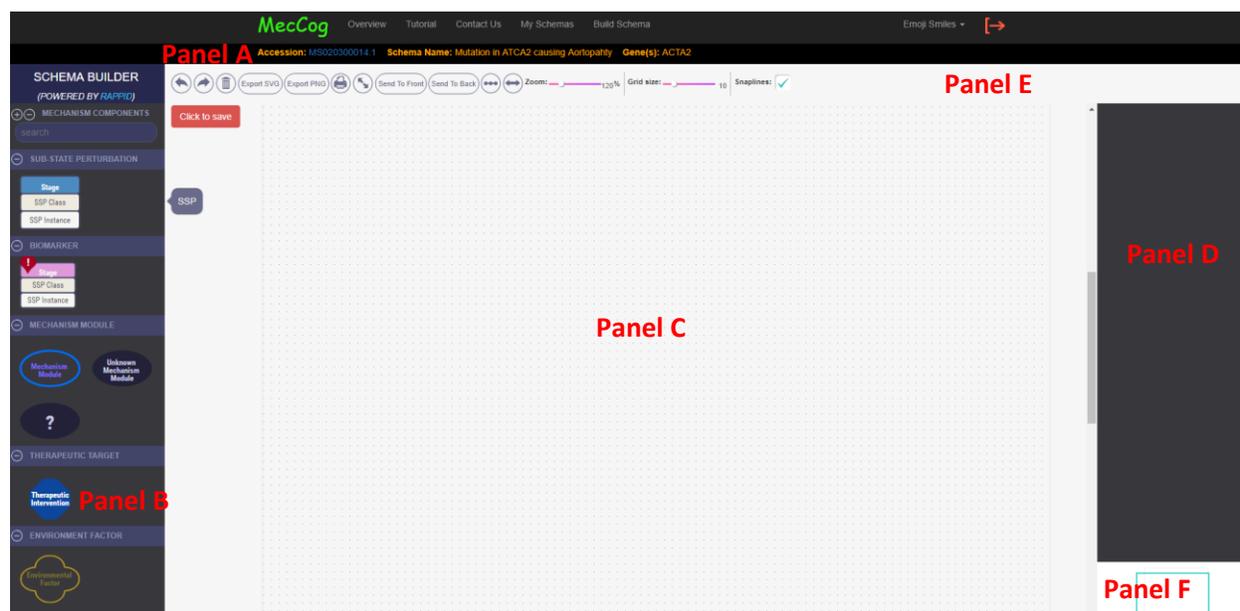
#### Introduction to the *Schema Builder* interface

MecCog has a built-in digital drawing board called *Schema Builder* used for building mechanism schemas.

##### 1. *Schema Builder* Interface Panels

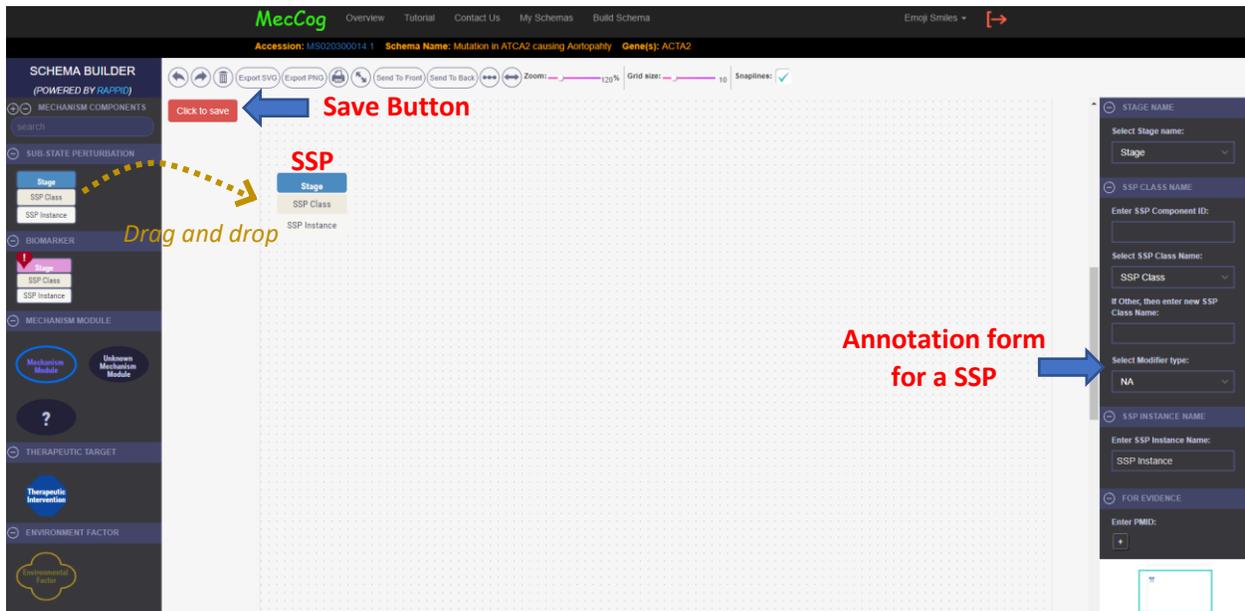
The *Schema Builder* interface has six panels (Figure below shows the six panels) –

- A. Mechanism Schema Info Panel that shows the meta-information for a mechanism schema such as accession number, schema name, and gene name(s).
- B. Mechanism Component Catalog Panel shows the different types of mechanism components.
- C. Drawing Board is the panel where mechanism schemas are drawn.
- D. Component Annotation Panel contains annotation form for a component. The form dynamically changes based on component type. The user selects stage and stage-dependent class names from a dropdown list in the form but also may enter new class names.
- E. Toolbar Panel for editing mechanism schema.
- F. A Bird's Eye View Panel that facilitates navigation of big complex schemas.



## 2. Drag and Drop Mechanism Components

The mechanism components can be dragged and dropped to the Drawing Board. Based on the type of mechanism component, the Annotation panel will be populated with an annotation form. The figure below shows an example of the annotation form for a Sub-State Perturbation (SSP).



### 3. Annotate Mechanism Components

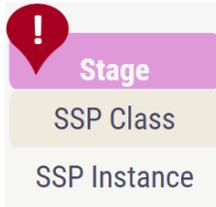
Each mechanism component has respective annotation forms and the description of each form is mentioned below –

## Annotation form for Sub-State Perturbation (SSP)

The image shows a vertical form for Sub-State Perturbation (SSP) annotation. The form is divided into several sections, each with a title and a set of input fields. Orange arrows point from text explanations to the corresponding input fields in the form.

- Stage** (Section Header)
- SSP Class** (Section Header)
- SSP Instance** (Section Header)
- STAGE NAME** (Section Header)
  - Select Stage name: Cell (dropdown menu) → Select a Stage to which the SSP belongs.
- SSP CLASS NAME** (Section Header)
  - Enter SSP Component ID: [text input] → Enter a component ID. E.g. S1, S2, S3
  - Select SSP Class Name: SSP Class (dropdown menu) → Select a Stage Dependent SSP Class Name
  - If Other, then enter new SSP Class Name: [text input] → If SSP Class name is not in above list, enter the new SSP Class name here
  - Select Modifier type: NA (dropdown menu) → Prefix a modifier to Class name. Modifiers are *increased*, *decreased*, *altered*, *NA*
- SSP INSTANCE NAME** (Section Header)
  - Enter SSP Instance Name: SSP Instance (text input) → Enter Class Instance Name. **Optional for Mechanism Module.**
- FOR EVIDENCE(S)** (Section Header)
  - Enter PMID: [text input with '+' icon] → Click on the '+' and **only enter the PMID** of the literature supporting the component.
- AGAINST EVIDENCE(S)** (Section Header)
  - Enter PMID: [text input with '+' icon] → Click on the '+' and **only enter the PMID** of the literature contradicting the component.
- CONFIDENCE SCORE** (Section Header)
  - Select Confidence Score: None (dropdown menu) → Select a confidence score for the component
- COMMENT** (Section Header)
  - Enter Comment: [text input] → Enter free text Comment about the component

## Annotation form for Biomarker



**STAGE NAME**  
Select Stage name:  
Cell  
Select a Stage to which the Biomarker belongs.

**SSP CLASS NAME**  
Enter SSP Component ID:  
Enter a component ID. E.g. B1, B2, B3  
Select SSP Class Name:  
SSP Class  
Select a Stage Dependent Biomarker Class Name  
If Other, then enter new SSP Class Name:  
If Biomarker Class name is not in above list, enter the new Biomarker Class name here  
Select Modifier type:  
NA  
Prefix a modifier to Class name. Modifiers are **increased**, **decreased**, **altered**, **NA**

**SSP INSTANCE NAME**  
Enter SSP Instance Name:  
SSP Instance  
Enter Class Instance Name. **Optional for Mechanism Module.**

**FOR EVIDENCE(S)**  
Enter PMID:  
+  
Click on the '+' and **only enter the PMID** of the literature supporting the component.

**AGAINST EVIDENCE(S)**  
Enter PMID:  
+  
Click on the '+' and **only enter the PMID** of the literature contradicting the component.

**CONFIDENCE SCORE**  
Select Confidence Score:  
None  
Select a confidence score for the component

**COMMENT**  
Enter Comment:  
Enter free text Comment about the component

## Annotation form for Mechanism Module (MM)



<p>MM CLASS NAME</p> <p>Enter MM Component ID:</p> <input type="text"/>	Enter a component ID. E.g. M1, M2, M3
<p>Select a Mechanism Module class name:</p> <input type="text"/>	Select a Mechanism Module Class Name
<p>If Other, then enter new Mechanism Module class name:</p> <input type="text"/>	If Mechanism Module Class name is not in above list, enter the new MM class name
<p>Select Modifier type:</p> <input type="text" value="NA"/>	Prefix a modifier to Class name. Modifiers are <i>increased, decreased, altered</i> .
<p>MM INSTANCE NAME</p> <p>If known, enter Mechanism Module instance name:</p> <input type="text"/>	Enter Class Instance Name (OPTIONAL)
<p>FOR EVIDENCE(S)</p> <p>Enter PMID:</p> <input type="text" value="+"/>	Click on the '+' and <b><u>only enter the PMID</u></b> of the literature supporting the component.
<p>AGAINST EVIDENCE(S)</p> <p>Enter PMID:</p> <input type="text" value="+"/>	Click on the '+' and <b><u>only enter the PMID</u></b> of the literature contradicting the component.
<p>CONFIDENCE SCORE</p> <p>Select Confidence Score:</p> <input type="text" value="None"/>	Select a confidence score for the component
<p>COMMENT</p> <p>Enter Comment:</p> <input type="text"/>	Enter free text Comment about the component

## Annotation form for Therapeutic Intervention



THERAPEUTIC ANNOTATION

Enter Therapeutic Target Component ID:

Enter Known Drug Name or Relevant Annotation (Press Enter in the text box to adjust name wrapping):

FOR EVIDENCE(S)

Enter PMID:

AGAINST EVIDENCE(S)

Enter PMID:

COMMENT

Enter Comment:

Annotations:

- Enter a component ID. E.g. T1, T2, T3
- Enter free text annotation
- Click on the '+' and **only enter the PMID** of the literature supporting the component.
- Click on the '+' and **only enter the PMID** of the literature contradicting the component.
- Enter free text Comment about the component

## Annotation form for Environmental Factor



ENV. FACTOR ANNOTATION

Enter Environmental Factor Component ID:

Enter Environmental Factor Name or Relevant Annotation (Press Enter in the text box to adjust name wrapping):

FOR EVIDENCE(S)

Enter PMID:

AGAINST EVIDENCE(S)

Enter PMID:

COMMENT

Enter Comment:

Annotations:

- Enter a component ID. E.g. E1, E2, E3
- Enter free text annotation
- Click on the '+' and **only enter the PMID** of the literature supporting the component.
- Click on the '+' and **only enter the PMID** of the literature contradicting the component.
- Enter free text Comment about the component

#### 4. Naming convention for the Mechanism Components class and instance names

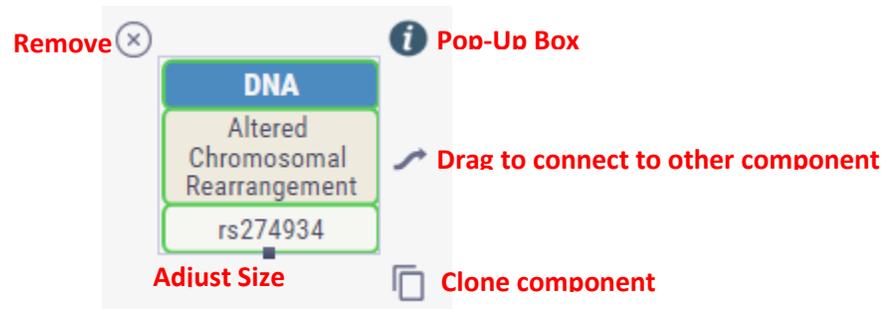
All words in the class definitions are in caps, following the ontology term standard. For instances, the first word of a phrase is capped and proper nouns and adjectives are capped. The HUGO convention is followed for human gene names and HGVS nomenclature is followed for naming genetic variants.

#### 5. Interactive Controls for each mechanism component

Each mechanism component has five types of controls that aid users in building schemas. The controls are –

- i) Remove a component
- ii) Adjust the size of a component
- iii) Clone the component
- iv) Show Pop-Up box
- v) Drag and connect to other components

The figure below shows the five types of controls –



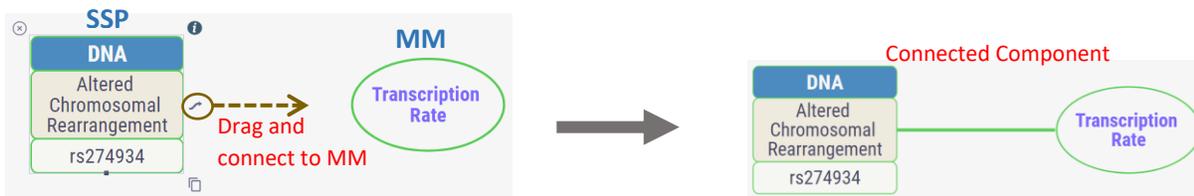
#### 6. Confidence Score converted to Confidence Color

The confidence scores entered in the annotation form for the mechanism components are converted to confidence color automatically by the system. A score of **1 converts to red color**, score of **5 converts to green color** and any **score in between converts to orange color**.

#### 7. Connecting Mechanism Components

The mechanism components can be connected using the “drag to connect” control (  ) of the component.

The below figure shows a case of connecting a Sub State Perturbation to a Mechanism Module.

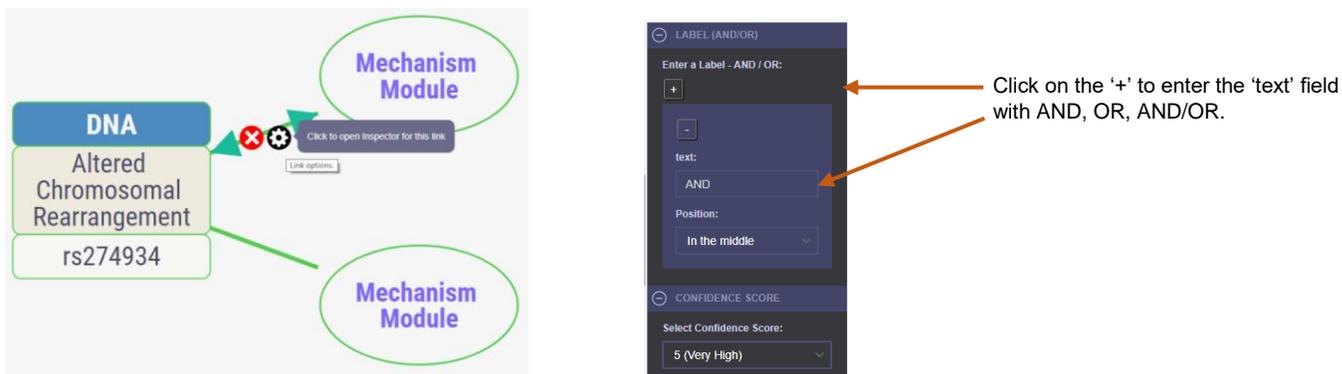


The color of the connecting line is inherited from the color of the target component. Unlike the connecting line from SSP to MM, an arrow head appears while connecting a MM to a SSP. This feature enables users to label the line with the MM that takes an input SSP and produces an output SSP.

### 8. Label Lines – AND, OR, AND/OR

The lines can be labeled with logic operations such as AND, OR, and AND/OR by clicking on the setting  button. This opens up an annotation form for the line in the Annotation panel to entering the label. The setting button appears on hovering the mouse over the connecting line.

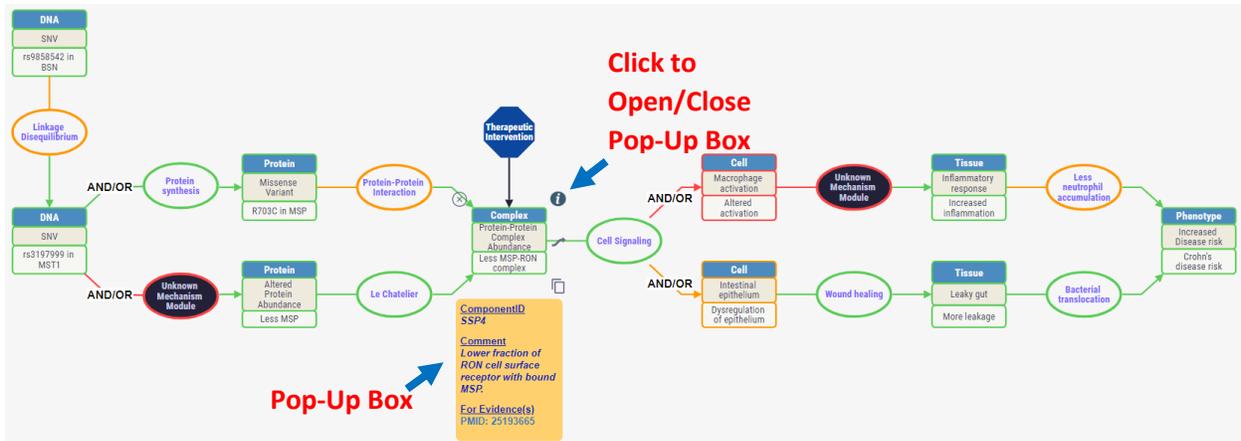
The image below shows the Annotation form for the line –



### 9. Pop-Up Box

A pop-up box for a component can be viewed by clicking on the  control icon. The pop-up box shows additional annotations for the component and also provides hyperlinked Pubmed IDs.

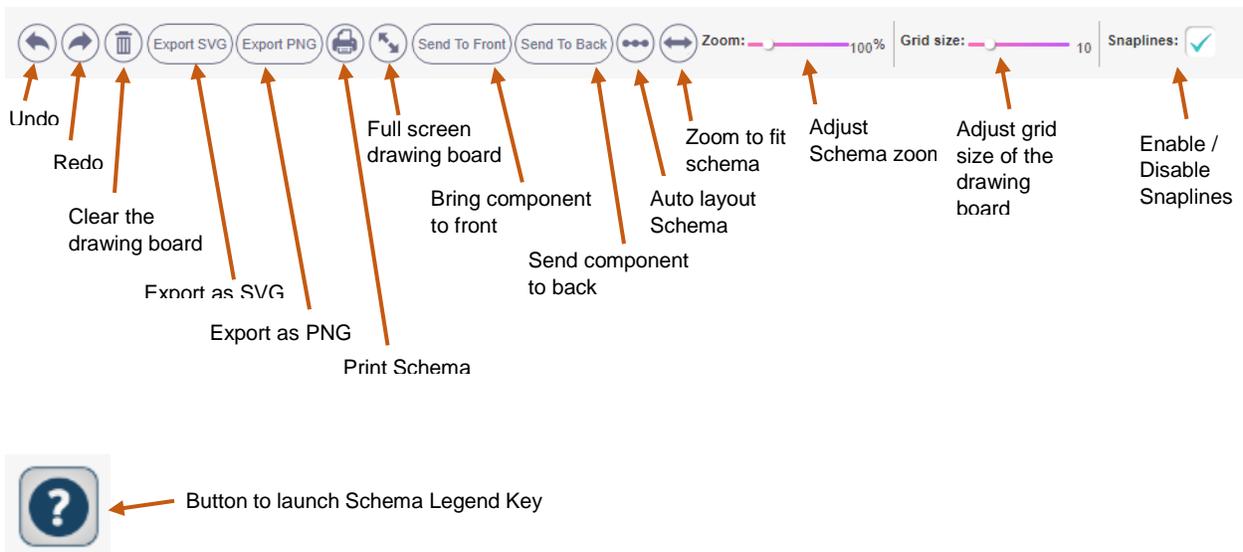
The image below shows the mechanism schema for *MST1 locus associated to Crohn's disease*.



## 10. Toolbar

The toolbar of *Schema Builder* provides number of utility tools to enhance user interactive experience with the mechanism schemas.

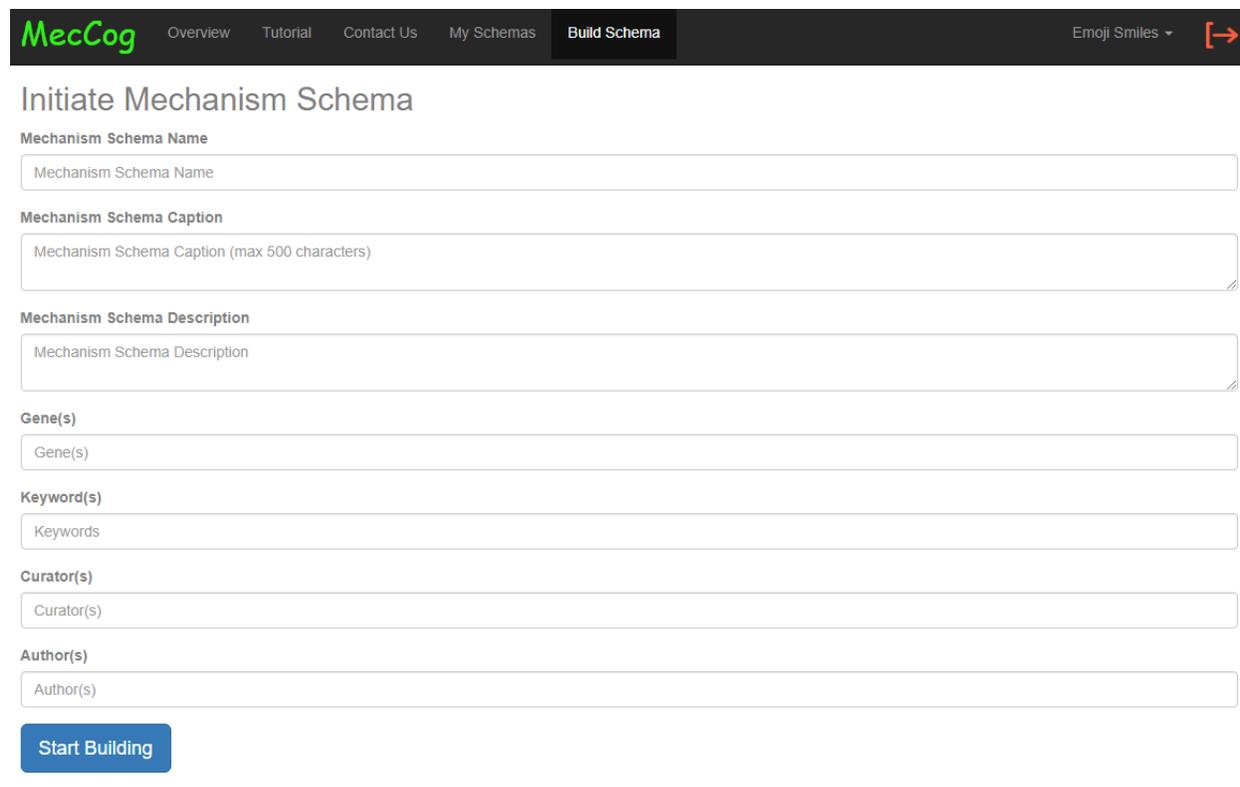
Below images show all the options present in the toolbar –



## Steps for building a Mechanism Schema

There are two steps to get started with building a mechanism schema –

1. Click on the “Build Schema” link on the menu to fill in the meta-information about a mechanism schema using *Initiate Mechanism Schema* form (shown below).



The screenshot shows the 'Initiate Mechanism Schema' form in the MecCog application. The navigation bar at the top includes 'MecCog', 'Overview', 'Tutorial', 'Contact Us', 'My Schemas', and 'Build Schema' (which is highlighted). There is also a 'Emoji Smiles' dropdown and a right-pointing arrow icon. The form itself has the following fields:

- Mechanism Schema Name:** A text input field with the placeholder 'Mechanism Schema Name'.
- Mechanism Schema Caption:** A text input field with the placeholder 'Mechanism Schema Caption (max 500 characters)'.
- Mechanism Schema Description:** A text input field with the placeholder 'Mechanism Schema Description'.
- Gene(s):** A text input field with the placeholder 'Gene(s)'.
- Keyword(s):** A text input field with the placeholder 'Keywords'.
- Curator(s):** A text input field with the placeholder 'Curator(s)'.
- Author(s):** A text input field with the placeholder 'Author(s)'.

At the bottom left of the form is a blue button labeled 'Start Building'. At the bottom right, there is a link for 'Moult Group' with the text 'Visit our lab and find out the exciting things we do!'.

2. Use *Schema Builder* interface to start building a schema.

The mechanism components are dragged and dropped to the drawing board of the *Schema Builder*. The components are annotated using the annotation form. Each component can be connected to other component(s) using the “drag to connect” control. The tools in the toolbar can be used appropriately to print, export or auto layout mechanism schemas.

3. Accession number for new schema

Each new schema gets a unique accession number that starts with “**MS**”. The accession number can be versioned reflecting the version of the schema. The version is denoted by a numeric value (such as .1, .2 or .3) suffixed to the accession number. The accession number of schemas are displayed in the user’s workspace.

4. Saving Schemas

All the mechanism schemas are saved to the database by clicking on the save button. The button/icons on the Panel C (Drawing Board) indicates the saving status.

	Click the button to save the save
	Indicates that the schema is being saved.
	Indicates that the schema is saved successfully.

## IV. Visualizing Mechanism Schemas

### Visualizing Schemas from the workspace

The accession number for a mechanism schema is hyperlinked for visualization as shown in the below figure –

Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
<a href="#">MS020300014.1</a>	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Thu Jul 19 2018 17:00:11 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete
<a href="#">MS020300014.2</a>	Mutation in ATCA2 causing Aortopathy	ACTA2	Tom Hanks	Thu Jul 19 2018 16:58:43 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete

Showing 1 to 2 of 2 entries Previous **1** Next

Clicking on the accession number opens up the landing page of a mechanism schema.

### Mechanism schema landing page

Each mechanism schema has a landing page that displays the meta-information of the schema such as Schema Name, Accession, Gene(s), Keywords, Schema Owner, Authors and References. It also provides links to the “Schema Visualizer” for interacting with the schema and “Schema Report” that describes the mechanism components in the schema in a machine readable format.

A typical landing page of a mechanism schema looks as shown below –

**MecCog** Overview Tutorial My Schemas Build Schema Emoji Smiles

### Mutation in ATCA2 causing Aortopathy

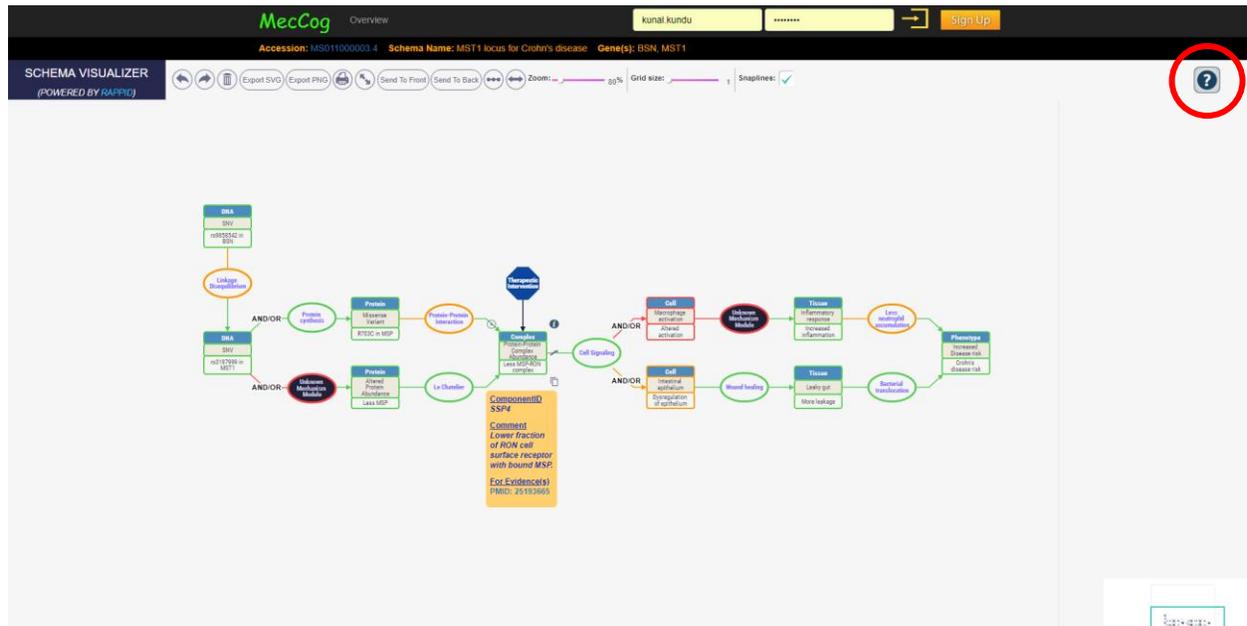
Accession	MS020300014.2
Description	The schema describes the mechanism connection between a pathogenic causative genetic variant and occurrence of Thoracic Aortic Aneurysm. The genetic variant was identified as part of a whole exome sequencing project.
Gene(s)	ACTA2
Keywords	Aneurysm, Exome Sequencing Project
Schemas Owner	Emoji Smiles
Author(s)	Tom Hanks
View Schema	<a href="#">Schema Visualizer</a> <a href="#">Schema Report</a>
References	<p>Macheret M, Halazonetis TD. <b>Intragenic origins due to short G1 phases underlie oncogene-induced DNA replication stress.</b> <i>Nature</i> 555 , 112-116 (2018) <a href="#">PMID:29466339</a></p> <p>Wei ZL, Pan CM, Jiang YZ, Yan-Dai, Huangang LQ, Huang DP. <b>Late Relapse of Multiple Myeloma with Testicular Plasmacytoma after Autologous Hematopoietic Stem Cell Transplantation: A Case Report and Review of the Literature.</b> <i>Annals of clinical and laboratory science</i> 48 , 120-125 (2018) <a href="#">PMID:29531008</a></p> <p>Chow JFC, Yeung WSB, Lee VCY, Lau EYL, Ng EHY. <b>Evaluation of preimplantation genetic testing for chromosomal structural rearrangement by a commonly used next generation sequencing workflow.</b> <i>European journal of obstetrics, gynecology, and reproductive biology</i> 224 , 66-73 (2018) <a href="#">PMID:29547808</a></p>

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## Schema Visualizer

The visualizer let users interact with the schema. The layout of *Schema Visualizer* is similar to *Schema Builder* except it does not contain the Mechanism Component Catalog Panel and Component Annotation Panel.

 Help icon displays the Legend Key for a mechanism schema. If the help icon is visible, try to adjust the resolution of the browser. The help icon always appears on the top right corner of the screen as shown the image below.



## Schema Report

The figure below shows a typical view of a report –

Schema Name	MST1 locus for Crohn's disease
Accession	MS011000003.4
Gene(s)	BSN, MST1
Description	How a Bassoon GWAS marker is related to Crohn's disease via Macrophage Stimulating 1.
Author(s)	Lipika R. Pal, John Moutl
Last Modified	Fri Mar 23 2018 22:31:24 GMT-0400 (EDT)
<b>Sub-state Perturbation (SSP) Annotations</b>	
<p>Stage: DNA            SSP Class: SNV            SSP Instance: rs9858542 in BSN            Confidence Score: 5            Comment: GWAS marker from WTCCC1 study, an intron in BSN gene.            For Evidences: PMID:17554300            Against Evidences:</p>	
<p>Stage: DNA            SSP Class: SNV            SSP Instance: rs3197999 in MST1            Confidence Score: 5            Comment: This SNP is in the coding region of MST1            For Evidences:            Against Evidences:</p>	
<p>Stage: Protein            SSP Class: Other            SSP Instance: R703C in MSP            Confidence Score: 5            Comment: Transcript NP_066278            For Evidences:            Against Evidences:</p>	

The report can be save as PDF by clicking on the print icon.

## Visualizing Schemas from MecCog homepage

The home page of MecCog provides a masonry layout of the all the published mechanism schemas. The page has two components –

1. Search Bar: User can enter gene name or keywords to filter mechanism schemas
2. The mechanism schema thumbnail that display the name, accession number, description, and images of the schema.

Clicking on the accession number takes to the landing page of the schema and clicking on the image takes to the *Schema Visualizer*.

The home page of MecCog appears as shown below –

The screenshot displays the MecCog homepage interface. At the top, there is a navigation bar with the MecCog logo, an 'Overview' link, a user profile 'kunal.kundu', a menu icon, and a 'Sign Up' button. Below the navigation bar is a search bar with the placeholder text 'Keyword or Gene name' and a magnifying glass icon. A blue arrow points to the search bar with the label 'Search Bar'. The main content area features a masonry layout of six mechanism schema thumbnails. Each thumbnail includes a title, an accession number, a date, a brief description, and a small diagram representing the mechanism. The thumbnails are: 1. TLR9 (MS011200016.2 | 2018-1-23) with the description 'How TLR9 is increasing Crohn's disease risk - it has epistatic interaction with NOD2, IL23R'. 2. MUC1 (MS011200017.1 | 2018-1-23) with the description 'Mucin-1 is a membrane-bound mucin - related to barrier integrity'. 3. TLR9-NOD2\_epistasis\_mechanism (MS011200018.2 | 2018-1-23) with the description 'What is the mechanism for TLR9 and NOD2 as epistatic pair for Crohn's disease?'. 4. NOD2 locus for Crohn's disease (MS011000007.4 | 2018-1-26) with the description 'How mutation in NOD2 is linked to increased Crohn's disease risk'. 5. ATG16L1 microbiome interaction schema (MS020200007.1 | 2018-1-28) with the description 'This schema will address, how ATG16L1 variant is affecting both anti-inflammatory response and microbial clearance in presence of microbiome *Bacteroides fragilis*, related to Crohn's disease or ulcerative colitis (IBD)'. 6. MST1 locus for Crohn's disease (MS011000003.4 | 2018-2-23) with the description 'How a Basoon GWAS marker is related to Crohn's disease via Macrophage Stimulating 1.'.

# Manage Mechanism Schemas

All the schemas generated by a user are available for manage operations in the User's workspace that can be seen by clicking on the "My Schema" link in the menu bar. A user can manage their schemas in six ways – 1. Branch, 2. Edit, 3. Share, 4. Publish, 5. Unpublish, and 6. Delete.

## 1. Version-It

This operation lets users create a new copy of a schema. The newly copied schema will have a newer version number suffixed to the accession number.

Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified	
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 18:04:48 GMT-0400 (Eastern Daylight Time)	 <a href="#">Version-It</a> <a href="#">Edit</a> <a href="#">Share</a> <a href="#">Publish</a> <a href="#">Delete</a>
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)	<a href="#">Version-It</a> <a href="#">Edit</a> <a href="#">Share</a> <a href="#">Publish</a> <a href="#">Delete</a>

Showing 1 to 2 of 2 entries Previous **1** Next

## 2. Edit

This operation lets users edit/update a mechanism schema's meta-information or the schema itself. This is done in two steps –

### i) Click on the Edit button

Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified	
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 18:04:48 GMT-0400 (Eastern Daylight Time)	 <a href="#">Edit</a> <a href="#">Share</a> <a href="#">Publish</a> <a href="#">Delete</a>
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)	<a href="#">Version-It</a> <a href="#">Edit</a> <a href="#">Share</a> <a href="#">Publish</a> <a href="#">Delete</a>

Showing 1 to 2 of 2 entries Previous **1** Next

### ii) Edit and Update meta-information or schema diagram

MecCog Overview My Schemas Build Schema Tom Hanks 

### Edit Mechanism Schema

Accession:

Mechanism Schema Name:

Mechanism Schema Description:

Gene(s):

Keywords:

Author(s):

[Update](#)  **Updates the meta-information**

[Edit Mechanism Schema](#)  **Opens up Schema Builder for editing schema**

### 3. Share

Users can shared their mechanism schemas with other MecCog users for collaborative effort. It involves the following two steps –

#### 1. Click on the ‘Share’ button

Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 18:04:48 GMT-0400 (Eastern Daylight Time)		Version-It	Share	Publish	Delete	
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete

Showing 1 to 2 of 2 entries Previous **1** Next

#### 2. Search for user for sharing and give appropriate access privilege

Please enter sharing details

**Enter User's name or Email**

**Select Access Privilege**

**Click + to share with more than one**

**Click to share**

Upon successfully sharing, a share icon will appear for the schema as shown below –

Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 18:04:48 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete

Showing 1 to 2 of 2 entries Previous **1** Next

### 4. Publish

Users can make their mechanism schema open for public viewing by clicking on the ‘Publish’ button. Once public the schema is listed under the “Published Mechanism Schemas” section of the workspace.

## Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 18:04:48 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete

Showing 1 to 2 of 2 entries Previous  Next

↓  
**Upon Publishing**

## Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tue Mar 27 2018 16:55:02 GMT-0400 (Eastern Daylight Time)		Version-It	Edit	Share	Publish	Delete

Showing 1 to 1 of 1 entries Previous  Next

## Published Mechanism Schemas

Show **5** entries Search:

**Published schema appears in this section**

Accession	Schema Name	Gene(s)	Author(s)	LastModified					
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Apr 01 2018 19:18:18 GMT-0400 (Eastern Daylight Time)		Edit	Share	Unpublish	

Showing 1 to 1 of 1 entries Previous  Next

## 5. Unpublish

Clicking on “Unpublish” button will make the mechanism schema private to user. It will no longer be viewable publically. The schema will be moved to the “Unpublished Mechanism Schemas” section.

## Published Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified					
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sun Mar 25 2018 09:26:41 GMT-0400 (Eastern Daylight Time)		Edit	Share	Unpublish	

Showing 1 to 1 of 1 entries Previous  Next

## 6. Delete

Clicking on the “Delete” button will **permanently remove the mechanism schema from the user’s workspace.**

## Unpublished Mechanism Schemas

Show **5** entries Search:

Accession	Schema Name	Gene(s)	Author(s)	LastModified						
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sat Mar 24 2018 19:24:51 GMT-0400 (Eastern Daylight Time)		Branch	Edit	Share	Unpublish	Delete
MS020300014.2	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Sat Mar 24 2018 19:32:25 GMT-0400 (Eastern Daylight Time)		Branch	Edit	Share	Publish	Delete

Showing 1 to 2 of 2 entries Previous  Next

## 7. Copy shared schema to workspace

For the schemas shared with the user with “Edit” privilege, the user can copy the shared schema to their own workspace. This is done by clicking on the “Copy to My Space” button. Upon copying the schema will appear on the “Unpublished Mechanism Schemas” section of the workspace.

Shared Mechanism Schemas

Show  entries

Search:

Accession	Schema Name	Gene(s)	Schema Owner	Author(s)	LastModified		
MS010800005.1	NBN Mechanism Schema	NBN	Sophie Huang	Kunal Kundu, John Moul	Mon Oct 02 2017 19:43:31 GMT-0400 (Eastern Daylight Time)		<a href="#">Copy to My Space</a>
MS020300014.1	Mutation in ATCA2 causing Aortopahty	ACTA2	Tom Hanks	Tom Hanks	Sun Mar 25 2018 09:48:21 GMT-0400 (Eastern Daylight Time)		<a href="#">Copy to My Space</a>

Showing 1 to 2 of 2 entries

Previous  Next