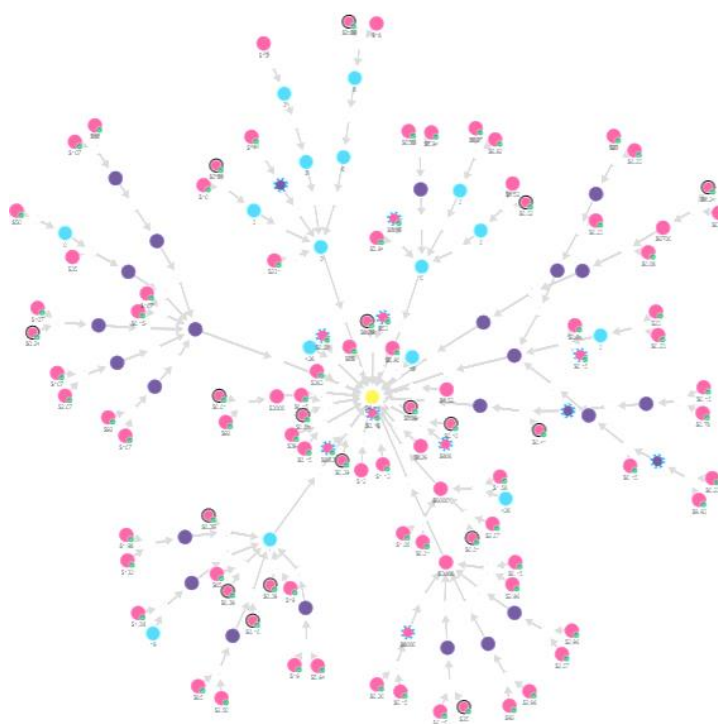


SYNTHIA™

Retrosynthesis Software



Quick-Start Guide

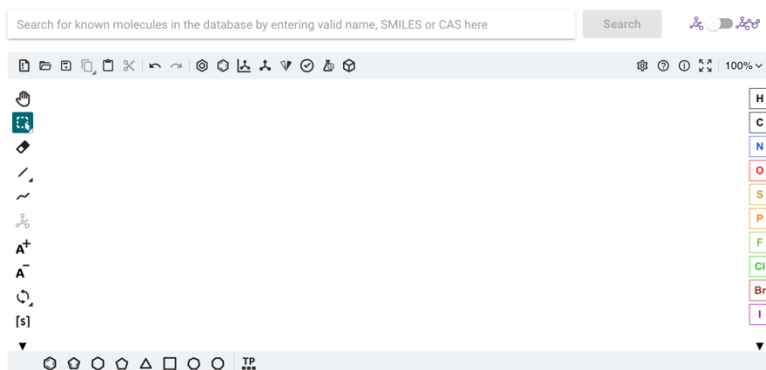


SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: New Analysis

1

Select New Analysis



2

Input your target

- Draw or paste a SMILES in the sketcher
- Search for a known molecule by name or CAS
- Upload or drag and drop a molecule file (mol or sdf)

Upload File

OR

Drag and Drop a molecule file here

3

Choose Analysis Type

Retrosynthesis

☒ Automatic



General



☐ Shared Path Library

☐ Step-by-step

Similarity Search

☐ Similar molecules

Start

Single Target   Multiple Targets 

- **Automatic:** Up to 50 pathways for each target from commercial starting materials   or  
- **Shared Path Library:** Up to 3 convergent routes to make library of targets from commercial starting materials   
- **Step-by-step:** All reactions to make target, one step at a time   



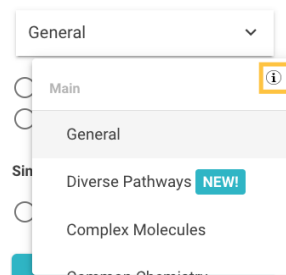
SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: Customize







4

Customize Search

- For **Automatic** or **Shared Path Library** click the DROP-DOWN and choose a CONFIGURATION
- Hover over ⓘ for more information on Configuration options



Exclude & Seek Structures/Sub-Structures/Keywords/Lists:

- Click  to Edit Configurations
- Choose the **EXCLUDE & SEEK** Tab
- Paste a SMILES or DRAW () using the **Structure Editor** to exclude/seek a starting material, intermediate, or sub-structure.
- Use **Keywords** to exclude/seek a **catalyst**, **reagent**, **solvent**, or **reaction type**.
- Exclude/Seek predefined **Lists of Molecules** [Create or Edit Molecule Lists](#)
- Exclude/Seek **Building Block type** based on EPA safer chemicals classification: Exclude ☐  ☐  Seek ☐  ☐ 

ANALYSIS PREFERENCES | **EXCLUDE & SEEK** | **STARTING MATERIALS**

Exclude

Structures ⓘ Paste or type in SMILES of molecules to exclude, separated by spaces or dots

Substructures ⓘ Paste or type in SMARTS of substructures to exclude, separated by spaces or dots

Keywords ⓘ Paste or type in keywords to exclude, separated by semicolons

Building block type ⓘ ☐  ☐ 

Predefined list of molecules ⓘ Select molecule lists to exclude

Predefined lists of substructures ⓘ Select substructure lists to exclude

Seek

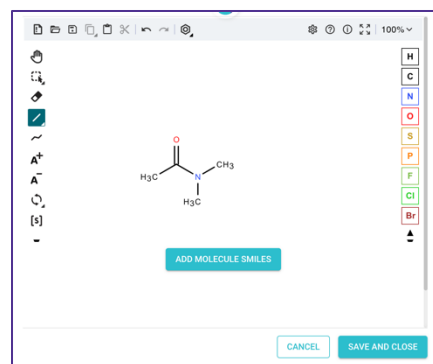
Structures ⓘ Paste or type in SMILES of molecules to seek, separated by spaces or dots

Substructures ⓘ Paste or type in SMARTS of substructures to seek, separated by spaces or dots

Keywords ⓘ Paste or type in keywords to seek, separated by semicolons

Building block type ⓘ ☐  ☐ 

Predefined list of molecules ⓘ Select molecule lists to seek



Define Starting Materials:

- Click **STARTING MATERIALS** tab
- Limit **COMMERCIAL** starting materials based on **price**, **molecular weight**, **emission information** and/or **minimum available quantity**
- Limit **PUBLISHED** starting materials based on **popularity** (minimum number of references) and **molecular weight**

☒ **Commercial**

1000 \$/g ⓘ

1000 g/mol ⓘ

☒ **Published**

15 popularity ⓘ

1000 g/mol ⓘ

☐ Restrict to molecules with spend-based emission factor information available ⓘ

☐ Restrict to molecules available in minimum quantity of 1 g ⓘ

- Click **Done** after Configuration is Complete then

Start Analysis



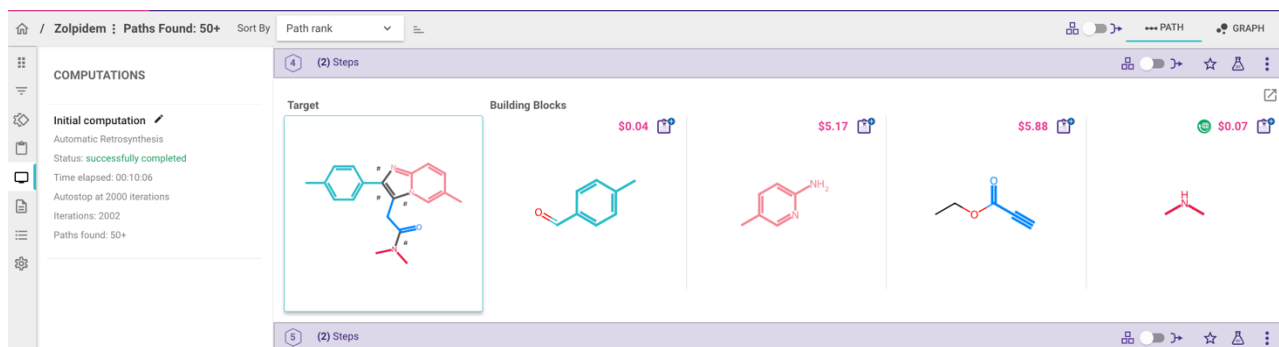
SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: RESULTS

5

View Initial Results

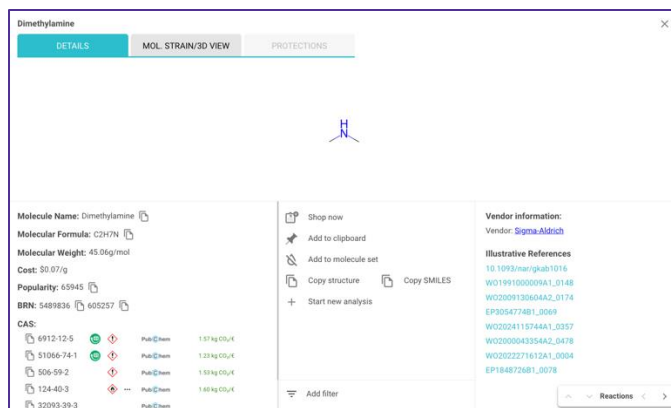
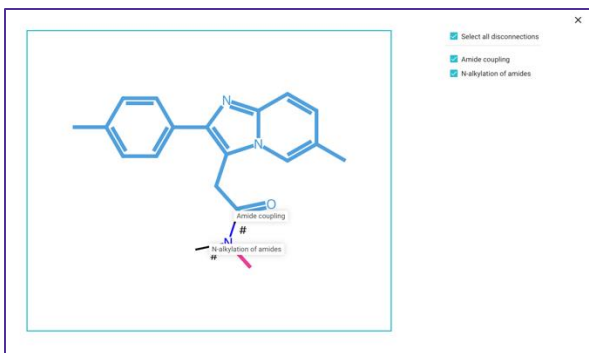
Once the **computations**  are complete, the status will change to **'Successfully Completed'** and default to the **Building Blocks View** sorted by **Path Rank**.



6

View Results: Building Block View

Click on Target to see disconnection summary. Click on any building block to view **Molecule Details** including **chemical hazard information**, **PubChem link**, and **Illustrative references**



CAS	PubChem	Cost
6912-12-5	PubChem	1.57 kg CO ₂ /€
51066-74-1	PubChem	1.23 kg CO ₂ /€
506-59-2	PubChem	1.53 kg CO ₂ /€
124-40-3	PubChem	1.65 kg CO ₂ /€
32093-39-3	PubChem	




SYNTHIA™ Retrosynthesis Software

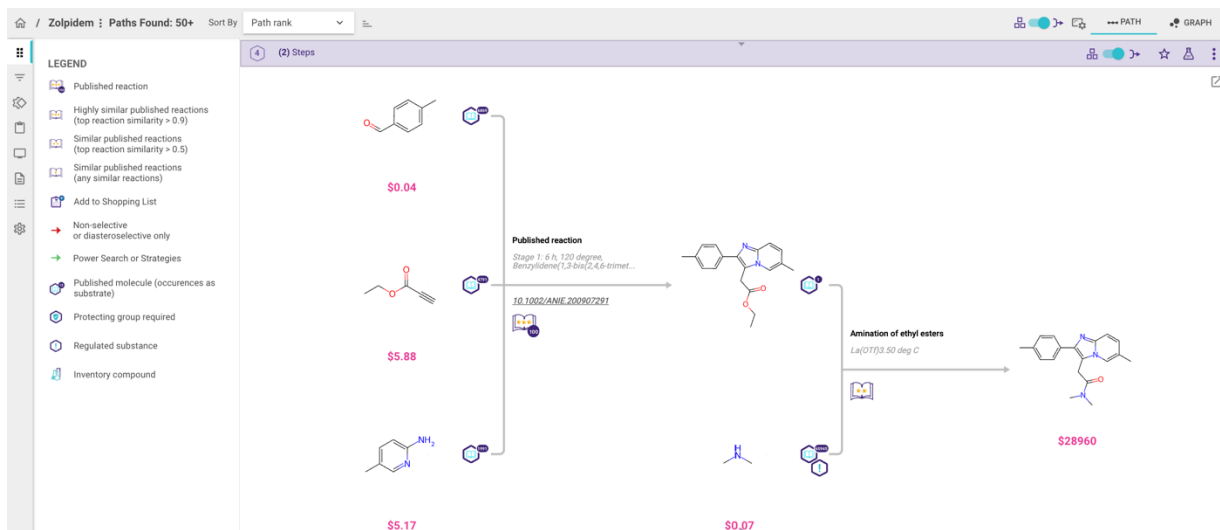
Quick-Start Guide: REFINE PATH VIEW

7

Results: Pathway View

Toggle entire results or individual pathways to see **Pathway View**    

Click on  to see symbols **Legend**.



Sort and View Results: Single Path View

Choose option to Sort by:

- Path rank
- Number of steps
- Number of protection steps
- Similarity to published reactions

Click any molecule or reaction to view corresponding **Molecule Details** or **Reaction Details**.

Click on  to view **Similar published reactions**.

Click on  (top right of pathway box) to open **Full Screen Pathway**

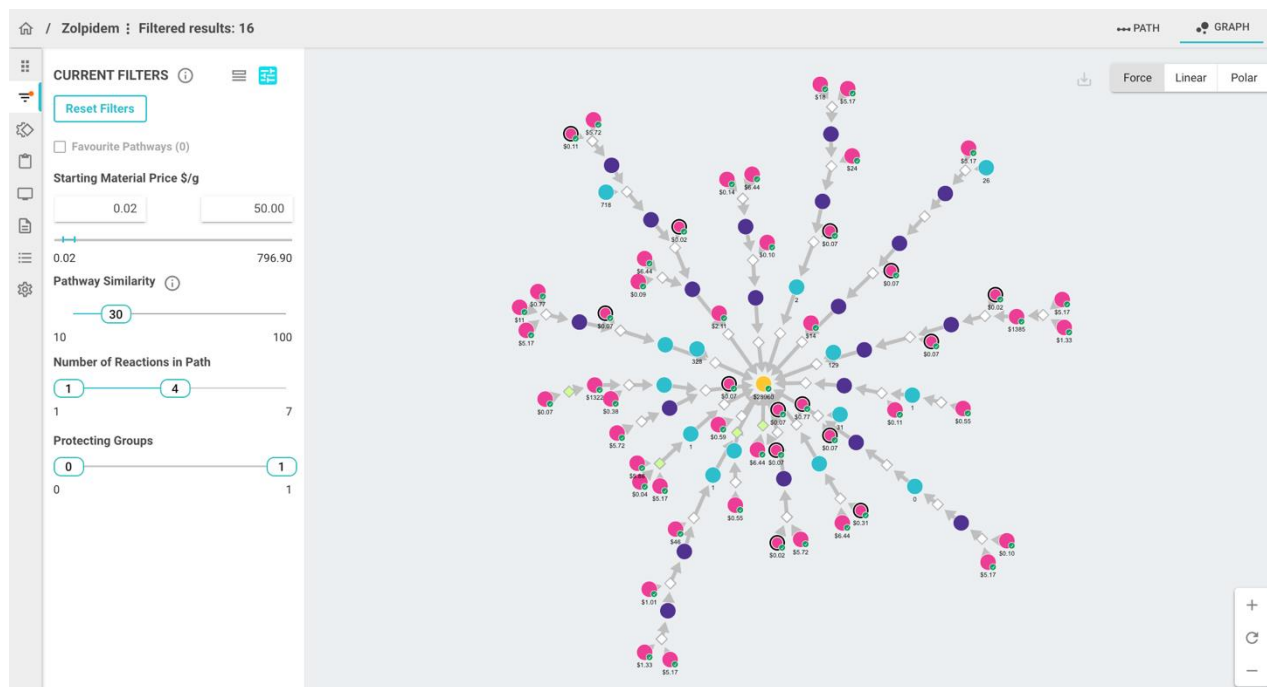


SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: REFINE GRAPH VIEW

8

View/Sort/Refine Results:
Graph View



View/Sort/Refine Results: Click Graph View

1. Click **Filter** icon

2. Click to adjust filters:

- **Starting Material Price (\$/g)**
- **Pathway Similarity**
- **Number of Reactions in Path**
- **Protecting Groups**

PRO TIP: For more diverse results, reduce **Pathway Similarity**

3. Click to view the **Reaction Report** to **Sort/Search/Refine** by:

- Reaction
- No. of Reactants
- Stereocenters
- Buyable/Known
- Create Rings
- Cut in Half



SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: REACTION REPORT

9

View/Sort/Refine Reaction Report:
Graph View

The screenshot displays the SYNTHIA Retrosynthesis Software interface. On the left, the 'REACTION REPORT' panel shows a search bar, sorting options (All Reactions, Reactions from highlighted selection, Reactions leading to specified molecule), and a list of reactions. The first reaction, '3CR synthesis of imidazopyridines from alkynes', is highlighted in yellow. Below it, the reaction details are shown, including reactants, reagents, and references. On the right, the 'GRAPH' view shows a complex network of reactions, with the highlighted reaction at the center. The graph is color-coded and includes a legend for 'Force', 'Linear', and 'Polar'.

1. Click then sort by/search and select a desired reaction to highlight (yellow).
2. To view **Reaction Details** click then **More Information**.
3. Refine results further under **Add filter** to **Exclude / Limit To**

This screenshot shows the 'REACTION REPORT' panel with the '3CR synthesis of imidazopyridines from alkynes' reaction highlighted. A context menu is open over the reaction, showing options: 'More information', 'Add to clipboard', 'Copy reaction', 'Add filter', and 'Exclude'. The 'More information' option is selected.

This screenshot shows the 'More information' panel for the '3CR synthesis of imidazopyridines from alkynes' reaction. It displays the reaction scheme, typical conditions (CuCl₂(OTf)₂, toluene, 120°C), and retrosynthesis ID (24260). Below the reaction scheme, there are tabs for 'DETAILS', 'PROTECTIONS', 'SIMILAR REACTIONS (50)', and 'SIDE REACTIONS (1)'. The 'DETAILS' tab is active, showing the reaction scheme and typical conditions. On the right, there are 'Illustrative References' with links to specific articles.

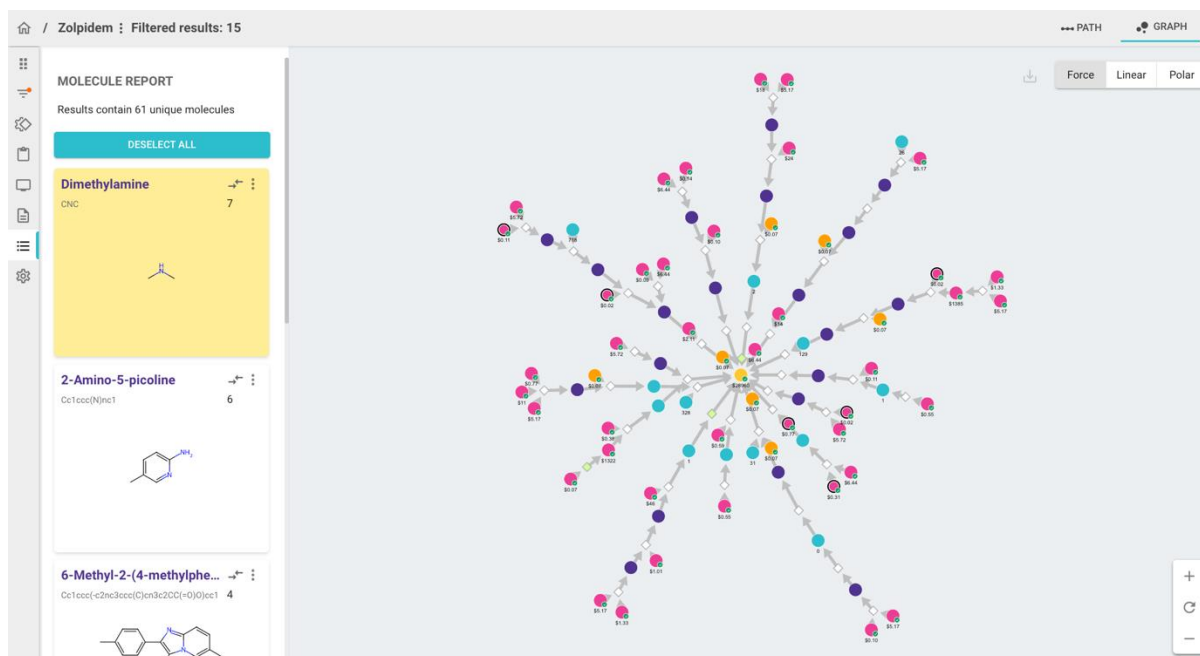








SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: MOLECULE REPORT

10

View Molecule Report:
Graph View



1. Click  to view the **Molecule Report**
2. Select a molecule to highlight in the graph.
3. Click  then select:
 1.  **More Information** – for a detailed look at the molecule
 2.  **Shop now** – to see pricing & availability
 3.  **Copy Structure** – to copy for use in the drawing tool or other application
 4. **+ Start New Analysis** – to view retrosynthesis of the selected molecule
 5.  **Add Filter – Exclude / Limit To** – to further refine the answer set & view a filtered pathway graph.



SYNTHIA™ Retrosynthesis Software

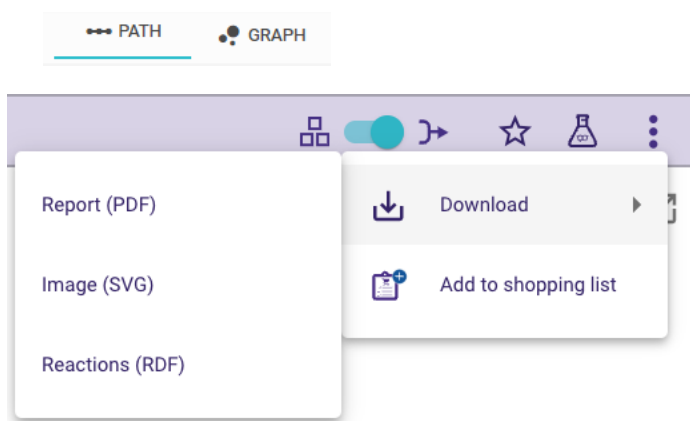
Quick-Start Guide: EXPORT



Export Pathway
Results

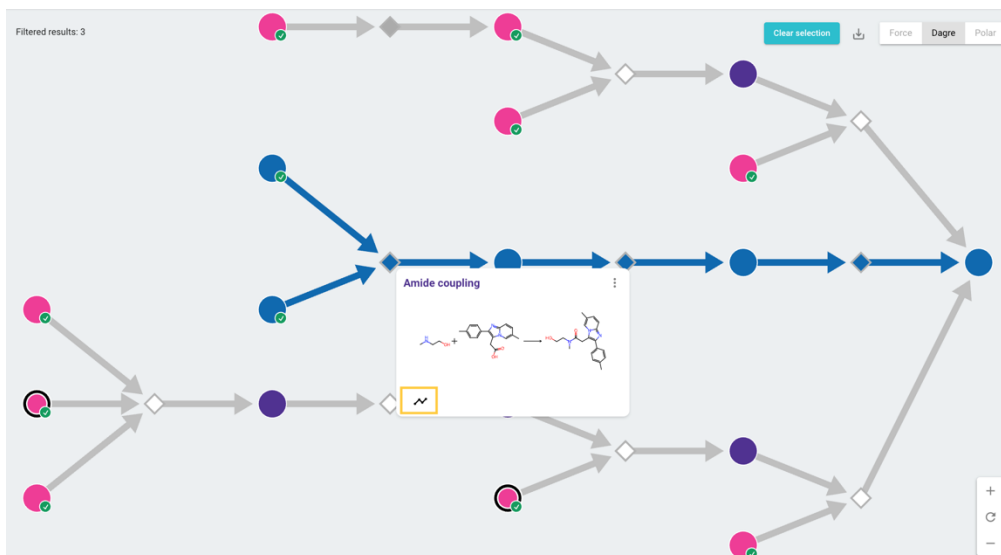
Export Single Pathway(s)

1. Click the desired analysis tile
2. Review & select the desired pathway(s)
3. Click
4. Choose **Download**
5. Select Export type:
 1. **PDF** – Document file
 2. **SVG** – Image file
 3. **RDF** – Reaction data file



Export Pathways in Graph View

1. Click on GRAPH to view reaction nodes
2. Choose **Linear** to view pathways as a tree
3. Select the desired pathway(s) by clicking the reaction node furthest from the target
4. Click on the **Pathway** icon at the lower left of the window for selected reaction
5. Click
6. Export selected pathway as a **PDF** document



SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: SHOPPING LIST






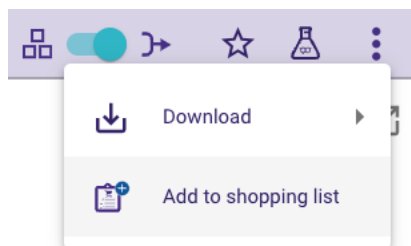
Shopping List

1. Link SYNTHIA™ to E-Commerce Account (first time only)

Click on  and follow prompts to login to Sigma-Aldrich E-commerce Account

2. Add to Shopping List from Pathway

1. Click the desired analysis tile
2. Review & select the desired pathway(s)
3. Click 
4. Choose  **Add to shopping list** to open Price and Availability window
5. Click  to see product options for desired compound
6. Click **Expand** to see price and availability details
7. Click + to add Quantity and then choose **Add to List**
8. Repeat for all desired compounds



Pricing and Availability



Showing 5 results for "127-19-5, 1603-41-4" within Products

Sort By: Relevance



Product No.	Brand	Description	Pricing
N,N-Dimethylacetamide Synonyms: [N,N-Dimethylacetamide] CAS No: 127-19-5 Molecule Weight: 87.12			
N,N-Dimethylacetamide Synonyms: [N,N-Dimethylacetamide, N,N-Dimethylacetamide solution] Empirical Formula(MW Notated): [C ₄ H ₉ NO] CAS No: 127-19-5 Molecule Weight: 87.12			
17308	Sigma-Aldrich	suitable for peptide synthesis, ≥99.8% (GC)	Hide ^
SKU	Pack Size	Availability	Price
17308-2.5L	2.5 L	Estimated to ship on 9/18/23, 8:00 PM	\$223
17308-1L	1 L	Available to ship on 6/15/23, 8:00 PM	\$110
			Add To List
271012	Sigma-Aldrich	anhydrous, 99.8%	Expand v



1 - 5 of 15



3. Export Shopping List

1. Click 
2. Check box for **Select All**
3. Choose  **Export** to download as .csv file
4. Choose **Buy Online** to open shopping list in E-Commerce site

YOUR LIST (2)

☒ **Select All**  

☒  **391956-800ML Dimethylamine solution**
2.0 M in THF
Qty: 1 

☒  **ARK2190-1L N,N-Dimethylacetamide**
Qty: 1 

Buy Online

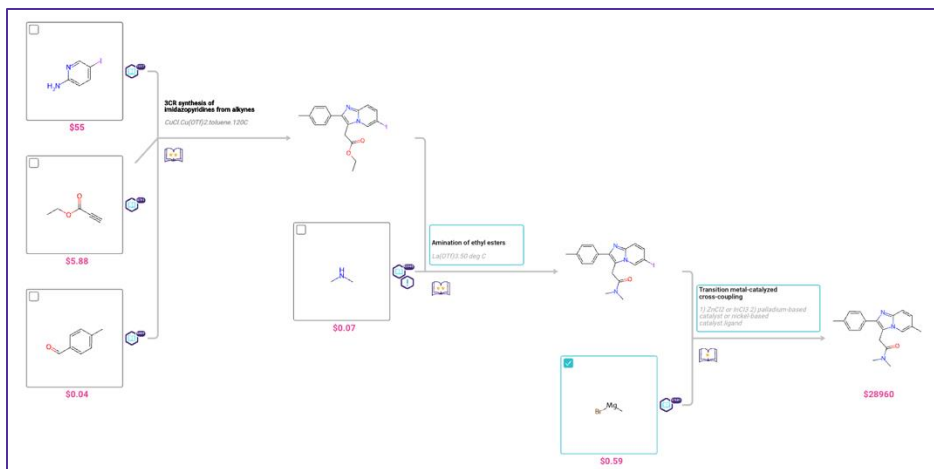
SYNTHIA™ Retrosynthesis Software


Quick-Start Guide: Diversity Library



Create Diversity Library

1. Click  to create library from selected pathway




2. ☒ Check box to select starting material(s)
3. Click reaction to see alternative rules (if available)
4. Select individual reactions or ☒ Select All
5. Choose library size ⓘ
6. Click  to limit price and size of starting materials
7.

☒ Commercial ⓘ ☒ Published ⓘ

\$/g ⓘ popularity ⓘ

g/mol ⓘ g/mol ⓘ

 ⓘ

Transition metal-catalyzed cross-coupling
1) ZnCl2 or InCl3 2) palladium-based catalyst or nickel-based catalyst ligand

Reaction Rules ⓘ

☒ Select All

☒ Transition metal-catalyzed cro... ⓘ

☒ Suzuki Coupling of arylbromide... ⓘ

☒ Suzuki Coupling of aryl iodides... ⓘ

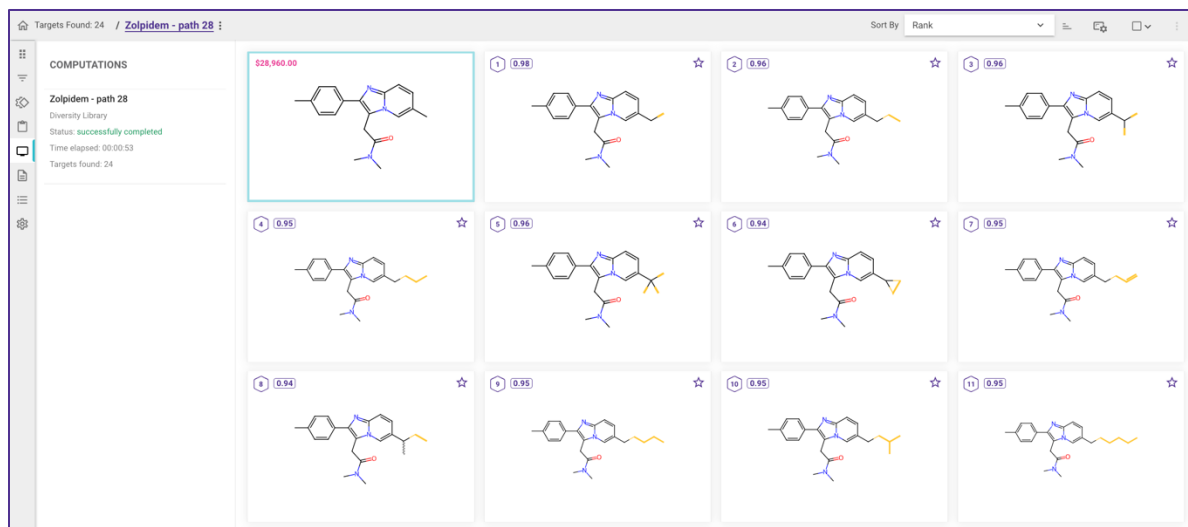


SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: Diversity Library

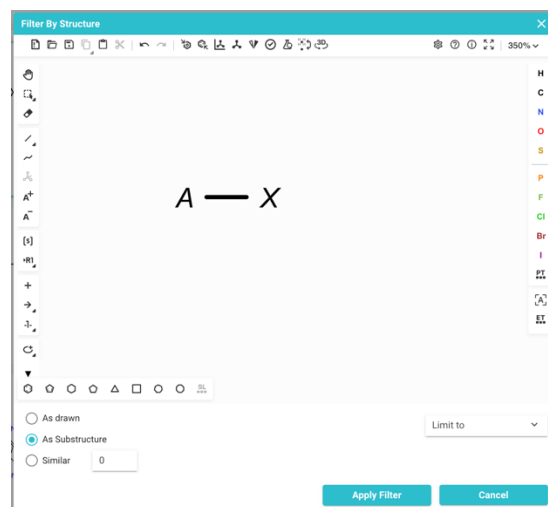


Review Diversity
Library

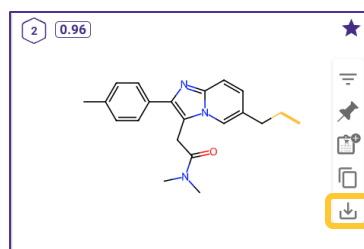


- Click structure to see pathway details
- Filter targets by structure or substructure:

- Open then click **Structures**
- Draw structure and choose **As drawn** or **As Substructure**
- Choose **Exclude** or **Limit to**
-



- Check box to select all or Ctrl+click to select individual targets
- Click and choose to download selection as HTML or CSV
- Hover-over individual target and click to download structure or pathway



SYNTHIA™ Retrosynthesis Software

Quick-Start Guide: SHARING



Organize & Share
Results

Organize Pathway Results on Homepage using Tags

1. Click to add a **Tag** to a search tile
2. Type the name of the Tag to create a new Tag or Choose an existing Tag
3. Click You may add multiple tags to a single search.
4. Click
5. Use **Filters** on left side to limit results list to corresponding tag

Shared

☐ By me

☒ With me

Date Created

From Date - To Date

Tags (8)

Search Tags

☐ Demo Batch

☐ April Batch

☒ Project A

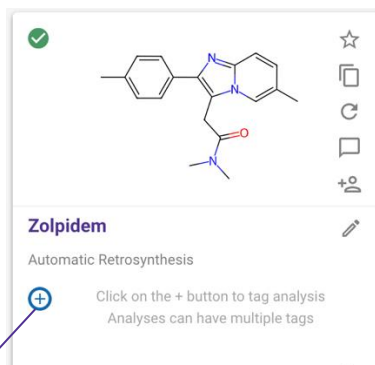
☐ Search Tutorials

☐ Todays search

☐ Training 1

☐ Training 2

☐ Training Examples



Tags for Zolpidem

Add a single tag and press Enter or click on Add button

#Project A

Share Pathway Results

1. Click on the share icon on the search results tile and type the email of the person you want to share the result with. SYNTHIA™ will show the name(s) of any matching users.
2. Click the **Share** button to send the pathway to colleague.
3. Use the **Filters** on left side of homepage to see searches that have been shared with me or by me
4. Click on the **Comment** icon to add or view comments

