Graz University of Technology

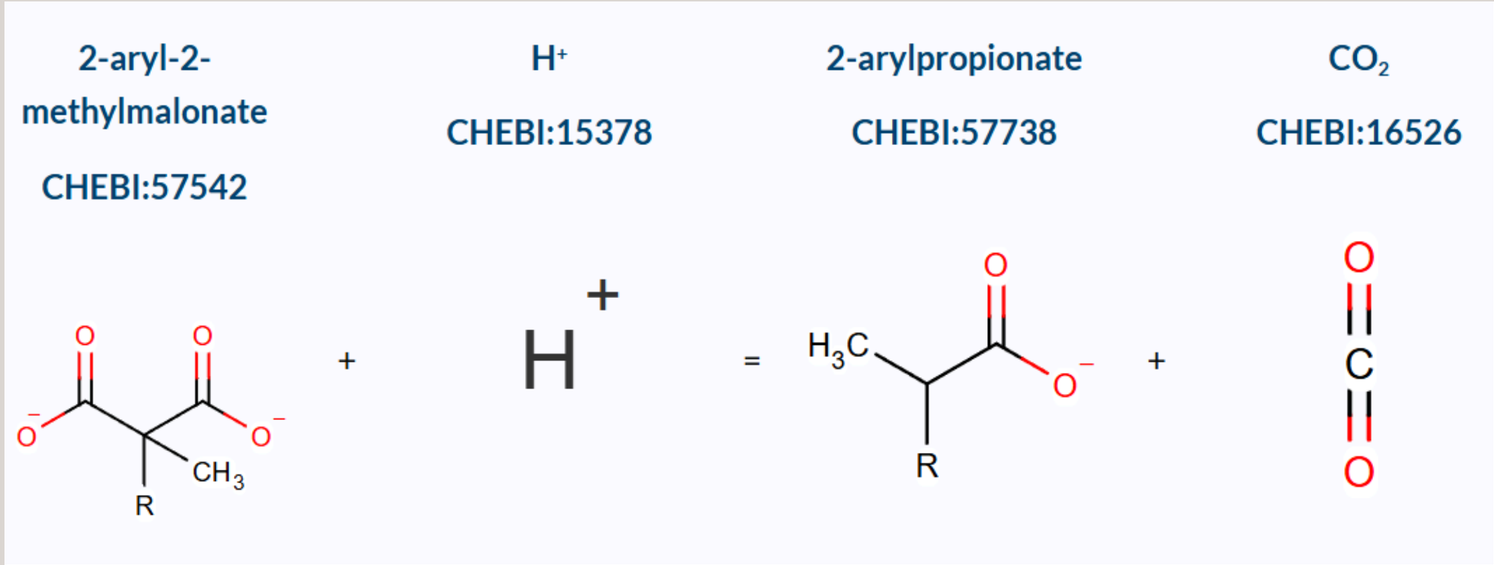
BLAST and Foldseek with Arylmalonate decarboxylase

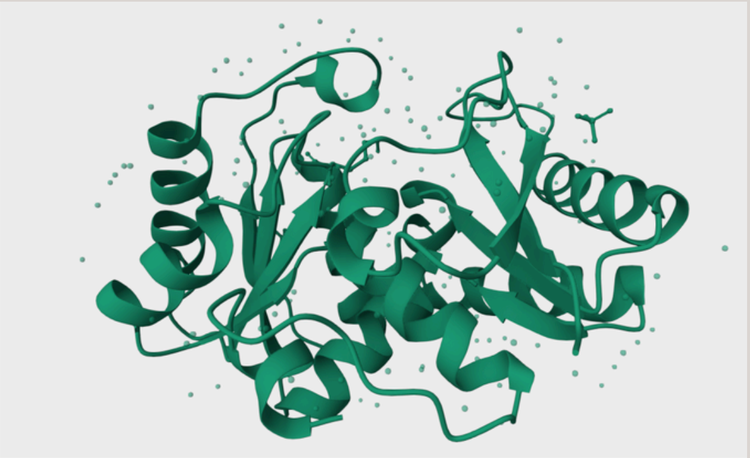
Presented by Hirschberger Anna, Jelic Ivana, Haxhi Nikol, Emilia Chua

Arylmalonate decarboxylase (3DTV)

Organism: Bordetella bronchiseptica

Catalytic function:





Uniprot → Q05115

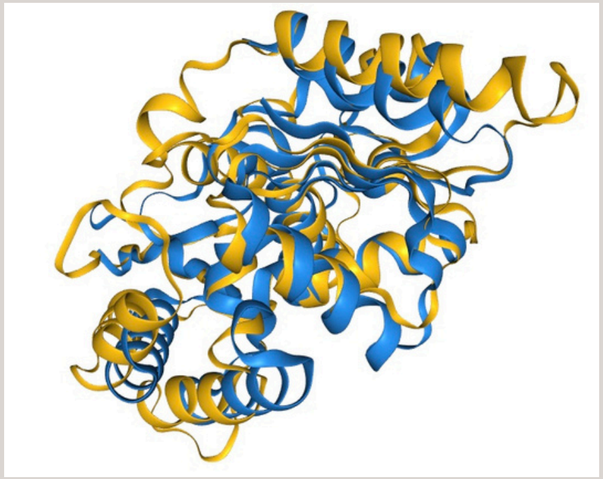
BLAST –
Basic Local Alignment Search Tool

→ finds regions of similarity between biological sequences

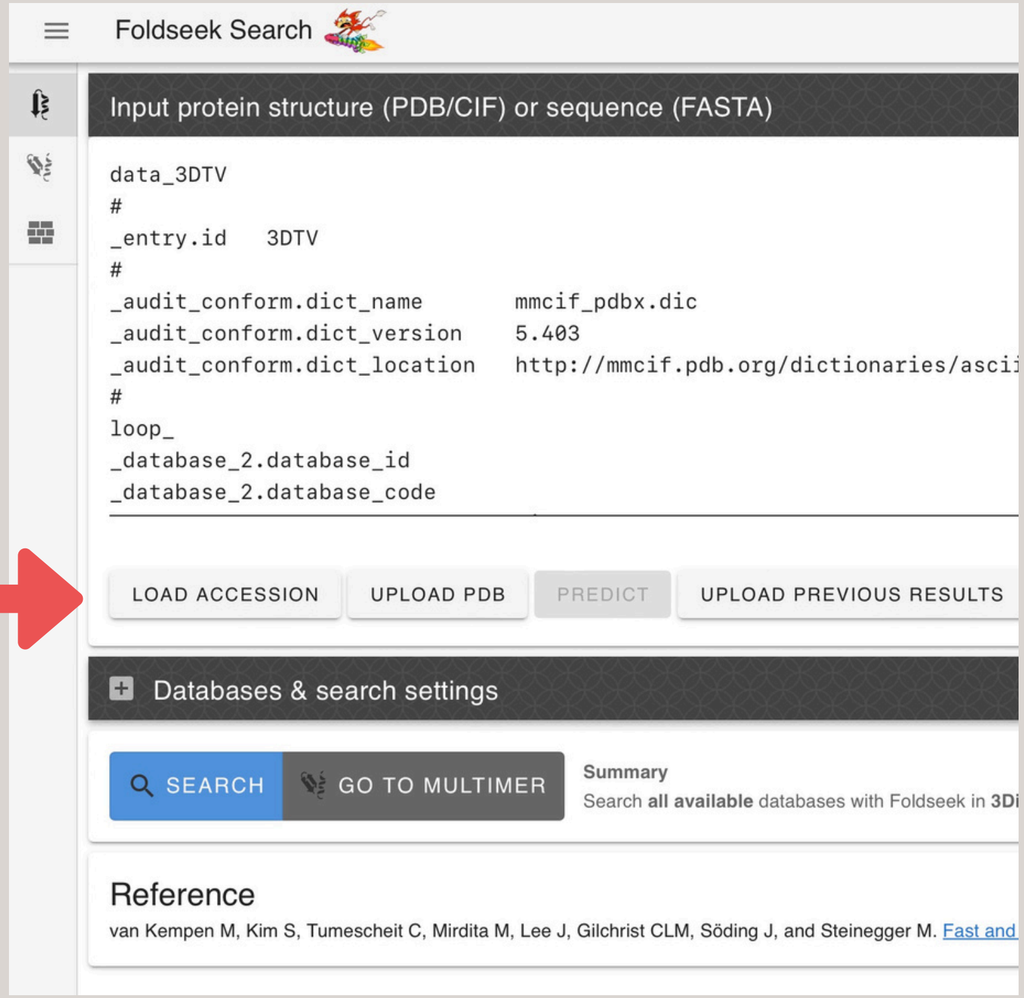
- QuickBLASTP
- BlastP
- PSI-BLAST
- PHI-BLAST
- DELTA-BLAST

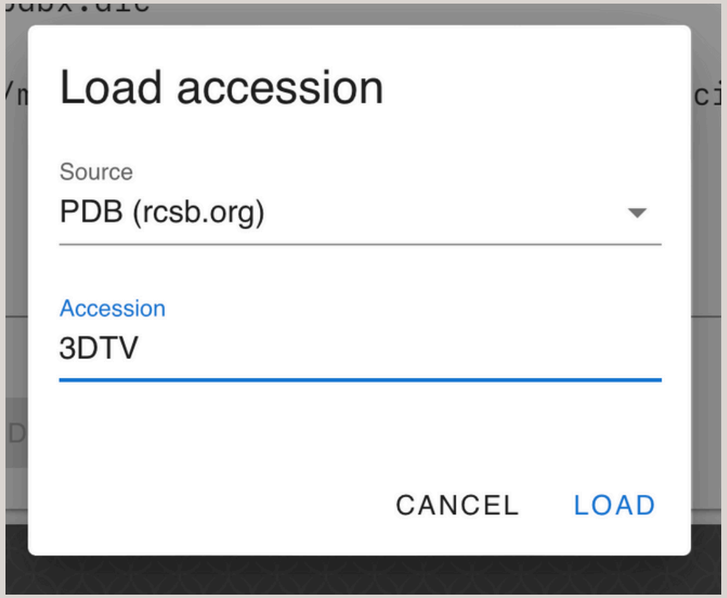
Foldseek

- comparing protein structures
- 3D protein shapes ⟶ simplified sequences
- rapid alignment
- structural searches: faster + good accuracy

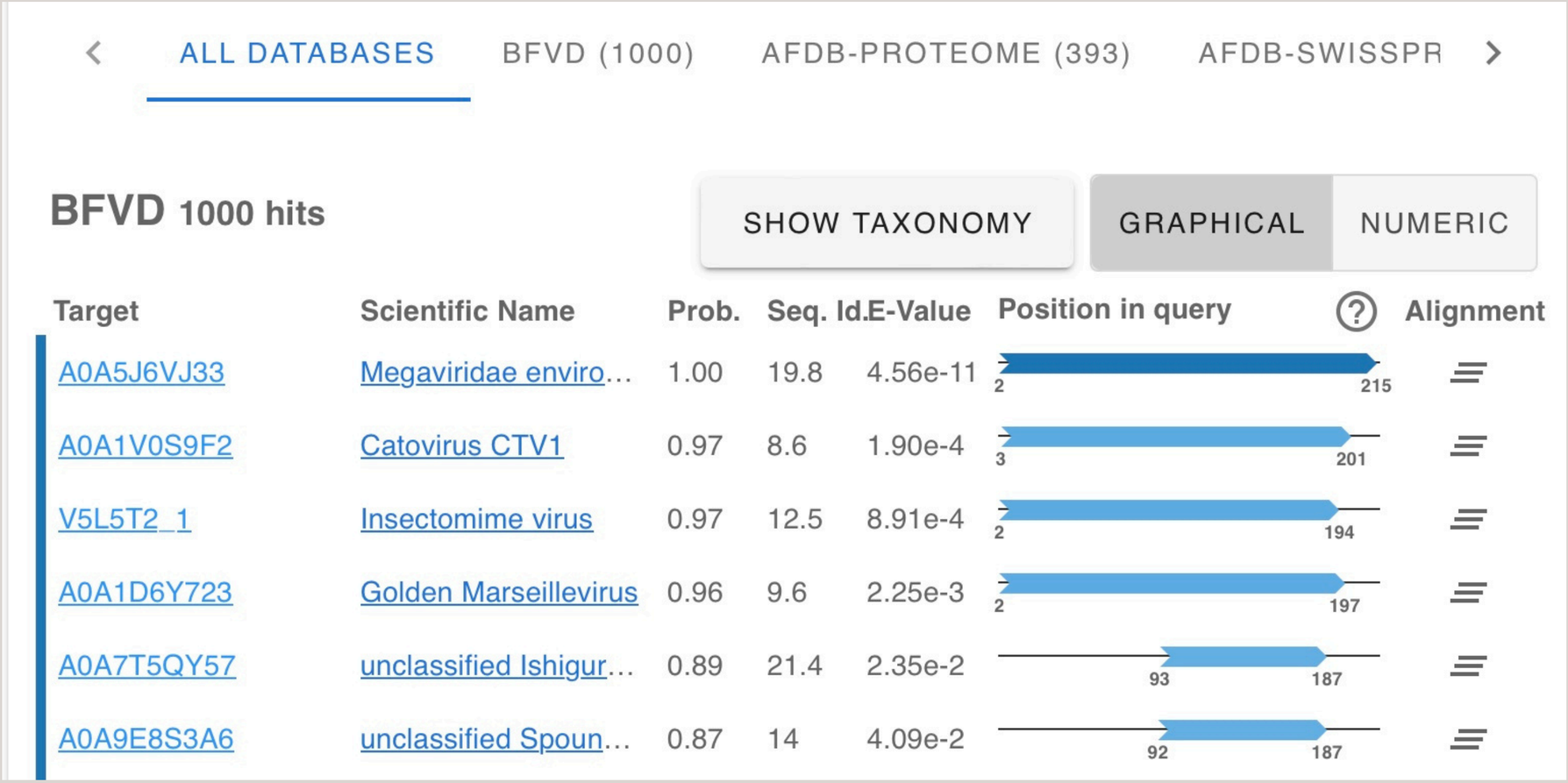


Foldseek Search



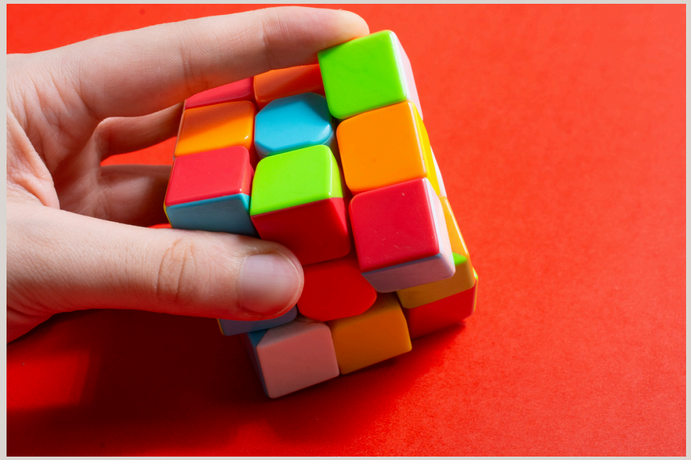


Result



Target	Scientific Name	Prob.	Seq. Id.	E-Value	Position in query	Alignment
A0A5J6VJ33	Megaviridae enviro…	1.00	19.8	4.56e-11	2 215	
A0A1V0S9F2	Catovirus CTV1	0.97	8.6	1.90e-4	3 201	
V5L5T2_1	Insectomime virus	0.97	12.5	8.91e-4	2 194	
A0A1D6Y723	Golden Marseillevirus	0.96	9.6	2.25e-3	2 197	
A0A7T5QY57	unclassified Ishigur…	0.89	21.4	2.35e-2	93 187	
A0A9E8S3A6	unclassified Spoun…	0.87	14	4.09e-2	92 187	

Feedback on BLAST



(-) Interface seems complicated at first

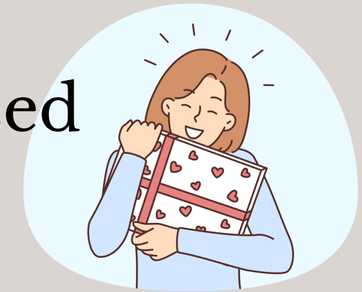
(+) Provides results quickly
(+) Easy to use
(+) Easy to save as FASTA file

Feedback on Foldseek

confusing: tutorials made it look easier

unexpected results: enzymes from viruses

After a while: user-friendly + well organized



National Library of Medicine
National Center for Biotechnology Information

RCSB PDB
PROTEIN DATA BANK

Thank you for your attention!

Foldseek Search