第44回日本分子生物学会年会

糖鎖とオミクスデータを統合化した GlyCosmos糖鎖科学ポータル

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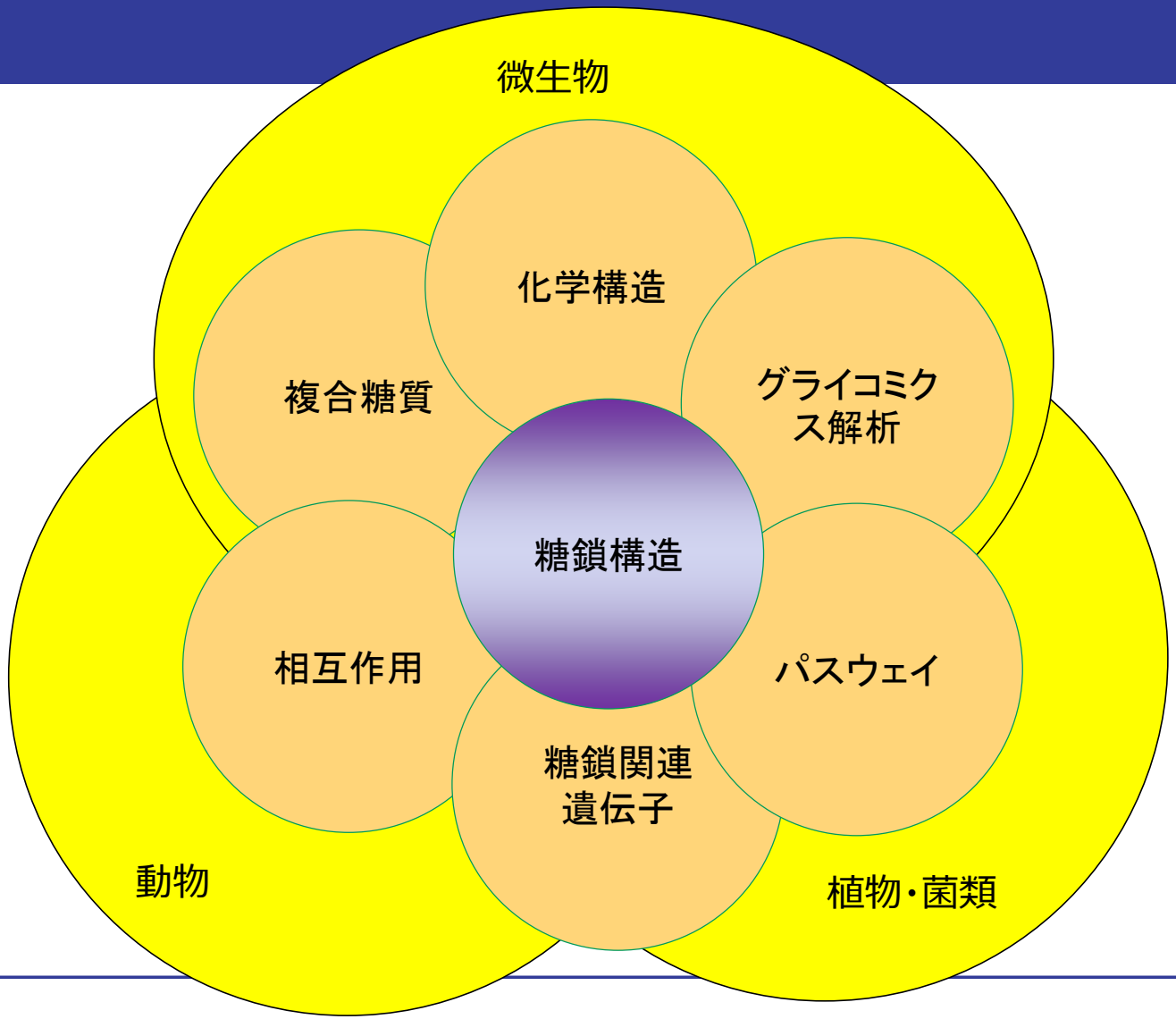
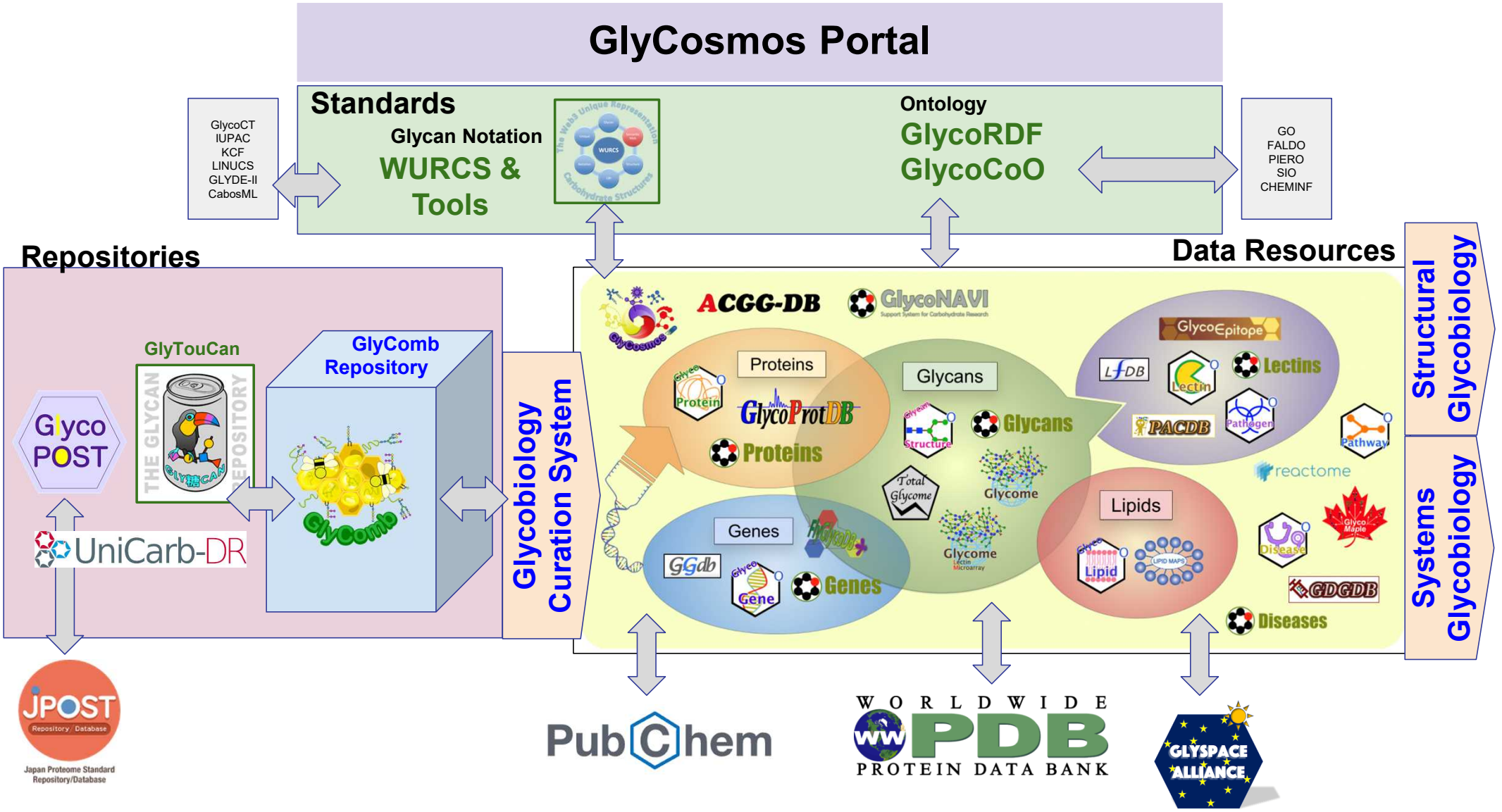
[2F-02]生命科学のデータベース活用法

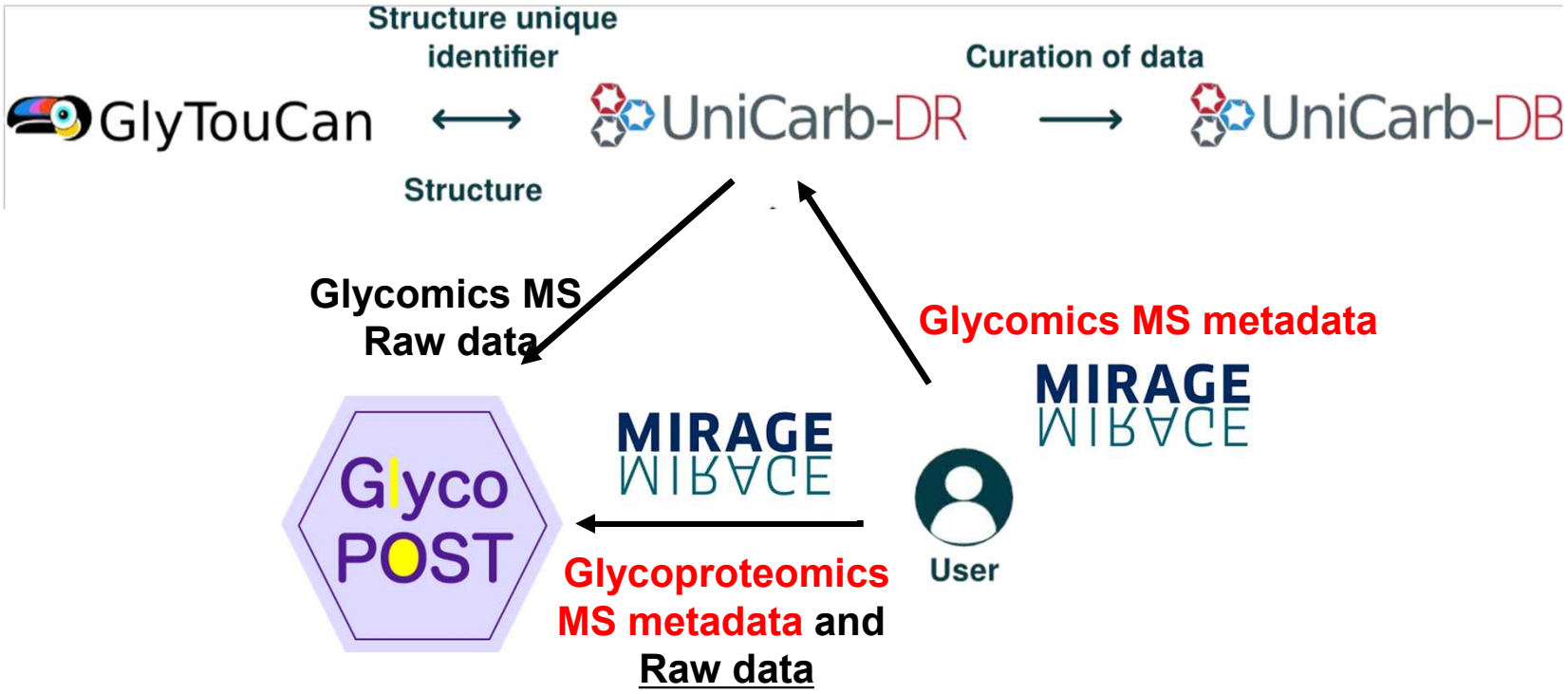
2021年12月2日

糖鎖の世界




GlyCosmos Portal
Standards
Glycan Notation
WURCS & Tools
GlycoCT
IUPAC
KCF
LINUCS
GLYDE-II
CabosML
Ontology
GlycoRDF
GlycoCoO
GO
FALDO
PIERO
SIO
CHEMINF
Repositories
GlyTouCan
GlyComb Repository
Glyco POST
UniCarb-DR
Glycobiology Curation System
Data Resources
ACGG-DB
GlycoNAVI
Proteins
GlycoProtDB
Glycans
Genes
Lipids
Diseases
GlycoEpitope
Lectins
PACDB
reactome
GDGDB
Structural Glycobiology
Systems Glycobiology
JPOST
Japan Proteome Standard Repository/Database
PubChem
WORLDWIDE PDB
PROTEIN DATA BANK
GLYSPACE ALLIANCE

GlycoPOST and UniCarb-DR



Repositories (Submissions)

Glycans

GlyTouCan

GlyTouCan is the international glycan structure repository.

Glycomic MS Data Repository

UniCarb-DR

UniCarb-DR is a repository of glycans with associated MS information and spectra.

UniCarb-DR

Glycoproteomics Data

GlycoPOST

GlycoPOST is a data repository for assigning accession numbers and embargoing raw data generated from glycomics and glycoproteomics mass spectrometry experiments

GlycoPOST UniCarb-DR

User account service

This is a user account service for GlycoPOST and UniCarb-DR.
Registration is required for submitting your data to these repositories.

Log in

Don't have an account? Sign up

Email address

Password

Forgot your password?

Log in

MIRAGEとの連携

- MIRAGE: Minimum Information Required for a Glycomics Experiment
- MIRAGE Recommendations:
  - GlyTouCan, GlycoPOST, UniCarb-DR, LM-GlycomeAtlas
- MIRAGE Ontologyの開発
  - https://gitlab.com/m708/mirage-ontologies
  - 質量分析メタデータのためのボキャブラリーの整理・管理

BEILSTEIN INSTITUT /ABOUT US /OPEN SCIENCE /PUBLICATIONS /PROJECTS /SYMPOSIA /TALKS /FUNDING /SEARCH D/E

HOME BACKGROUND AIMS GUIDELINES EXAMPLES PEOPLE PUBLICATIONS MEETINGS CONTACT

PROJECTS > MIRAGE > RECOMMENDATIONS

MIRAGE RECOMMENDATIONS

As an platform for discussing and advancing glycomics, MIRAGE is paving the way for a number of related projects that include the development of software tools and repositories as well as the suppport of the use of an agreed nomenclature for the graphical representation of glycan structures. In order to promote these achievements, the MIRAGE Commission recommends the community to refer to these projects when glycan data are published and/or deposited.

REPOSITORIES AND DATABASES

Data	MIRAGE Guidelines	Repository	Database
Glycans	Sample Preparation	GlyTouCan	GlyTouCan MonosaccharideDB Carbohydrate Structure DB (CSDB)
MS data	Mass Spectrometric Analysis	GlycoPOST (raw data) UniCarb-DR (glycan annotations)	UniCarbDB
Glycan array data	Glycan Microarray Analysis	GlyGen microarray Imperial College Microarray Portal	CarbArrayART
Liquid chromatography data	Liquid Chromatography Analysis		GlycoStore
NMR data	NMR Glycan Recognition NMR Glycan Structures		NMRShiftDB
Lectin array data	Lectin Microarray Analysis (in preparation)		LM-GlycomeAtlas

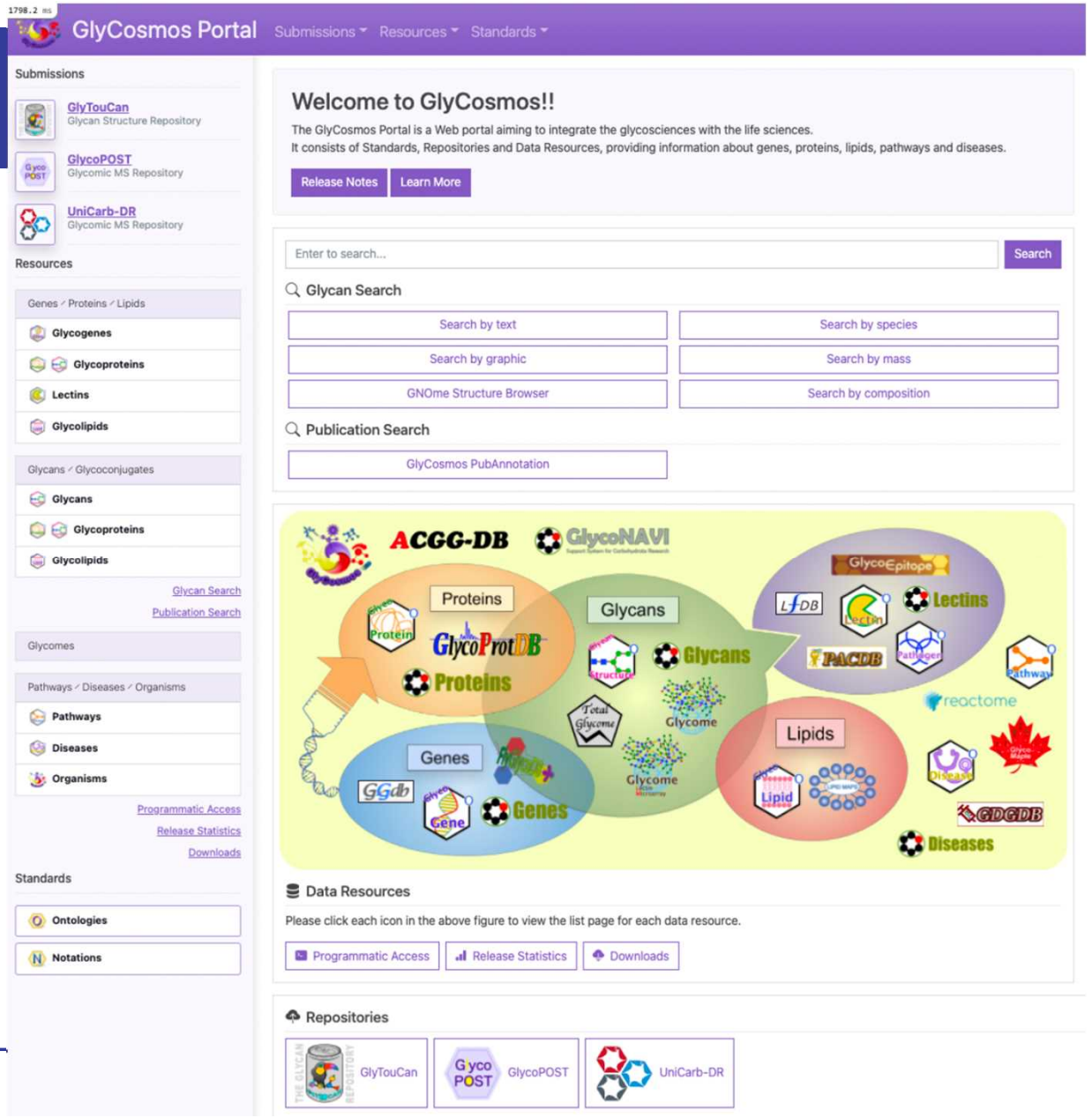
GLYTOUCAN

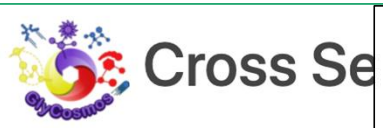
GlyTouCan is the international glycan structure repository, developed and maintained at the Department of Bioinformatics, Faculty of Engineering, Soka University, Japan under the leadership of Prof. Kiyoko Aoki-Kinoshita.

GlyTouCan is a freely available, uncurated registry for glycan structures that assigns globally unique accession numbers to any glycan independent of the level of information provided by the experimental method used to identify the structure(s).

12月リリースのバージョン２

- 12月6日リリース予定
- 横断検索や糖鎖構造検索を中央に配置
- PubAnnotationの検索結果
- 疾患情報の追加
- ダウンロードページやAPIなどもわかりやすく





Cross Se

Search across GlyCosmos Resou

All

Search

Example search words

Search results for **integrin**

Genes/Proteins/Lipids

GlyCosmos Gly

GlyCosmos Gly

GlyCosmos Lec

GlyCosmos Gly

GlyCosmos Gly

GlyCosmos Glycoproteins

A list of glycoproteins extracted from UniProt and annotated with glycosylation. From the entry page, you can check various information related to glycoproteins, such as glycosylation site, sequence information, three-dimensional structure, and pathway.

Database Name	Last Update
UniProt	December 9, 2020

Search results for **integrin beta**

Show 10 entries

To search, enter a keyword in the text box and press Enter (return).

Show hidden columns

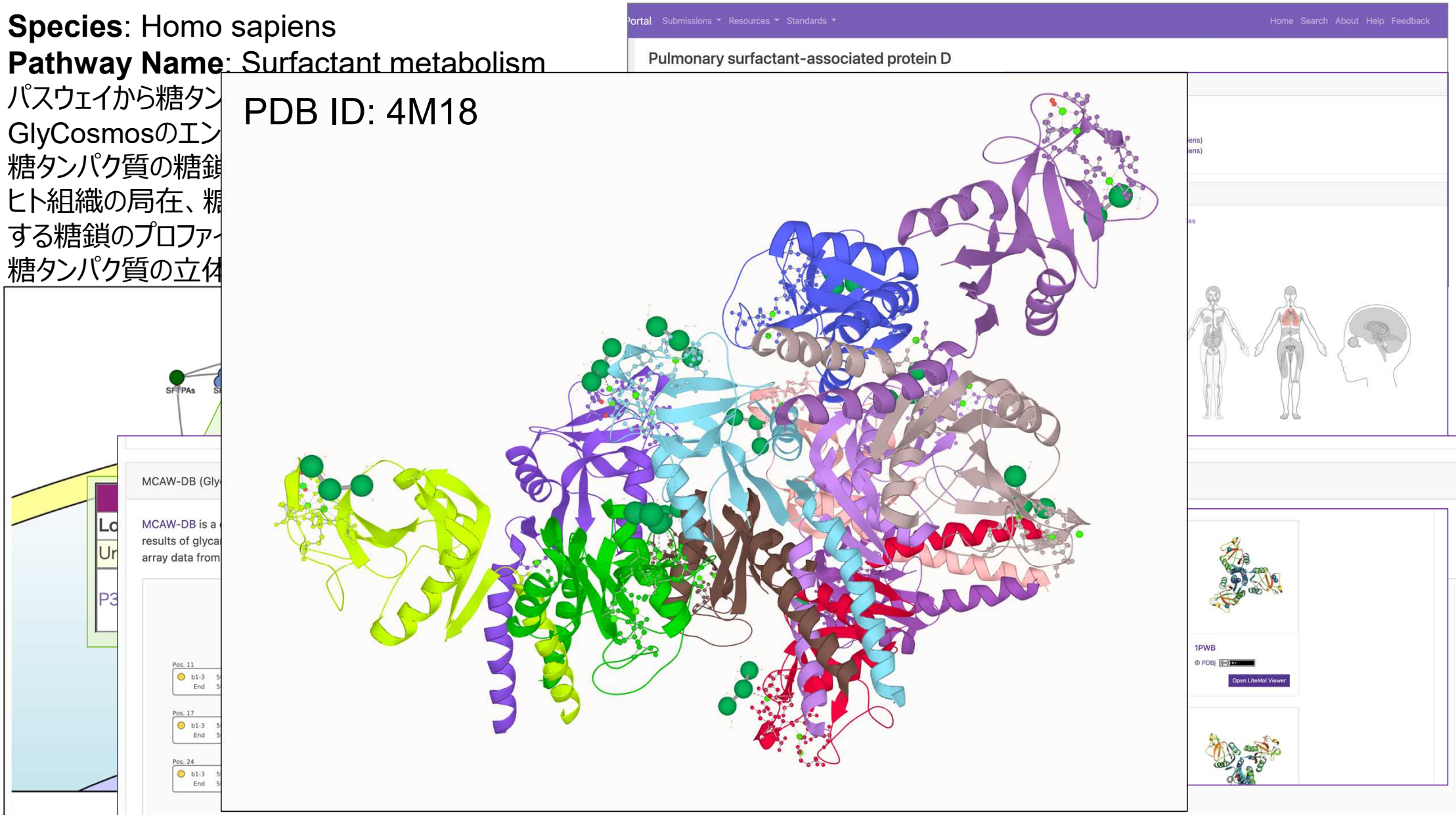
Protein Name	UniProt ID	Gene Symbol	Organism	No. of Glycosylation Sites	No. of GlyTouCan IDs	Disease Name	Disease Aliases
Search	Search	Search	Search			Search	Search
Integrin beta pat-3	Q27874	pat-3	Caenorhabditis elegans	9	No data	No data	No data
Integrin beta-1	P49134	Itgb1	Rattus norvegicus	12	No data	No data	No data
Integrin beta-1	A5Z1X6	ITGB1	Camelus bactrianus	10	No data	No data	No data
Integrin beta-1	P07228	ITGB1	Gallus gallus	12	No data	No data	No data
Integrin beta-1	B0FYY4	ITGB1	Ovis aries	10	No data	No data	No data
Integrin beta-1	Q9GLP0	ITGB1	Sus scrofa	12	No data	No data	No data
Integrin beta-1	P53712	ITGB1	Bos taurus	12	No data	No data	No data
Integrin beta-1	P53713	ITGB1	Felis catus	12	No data	No data	No data
Integrin beta-1	P05556	ITGB1	Homo sapiens	12	91	No data	No data
Integrin beta-1	P09055	Itgb1	Mus musculus	12	27	No data	No data

Showing 1 to 10 of 55 entries

Download the displayed table (.tsv) | Download the search results (.tsv)

Previous 1 2 3 4 5 ... 6 Next

Species: Homo sapiens
Pathway Name: Surfactant metabolism
パスウェイから糖タン
GlyCosmosのエン
糖タンパク質の糖鎖
ヒト組織の局在、糖
する糖鎖のプロファ
糖タンパク質の立体

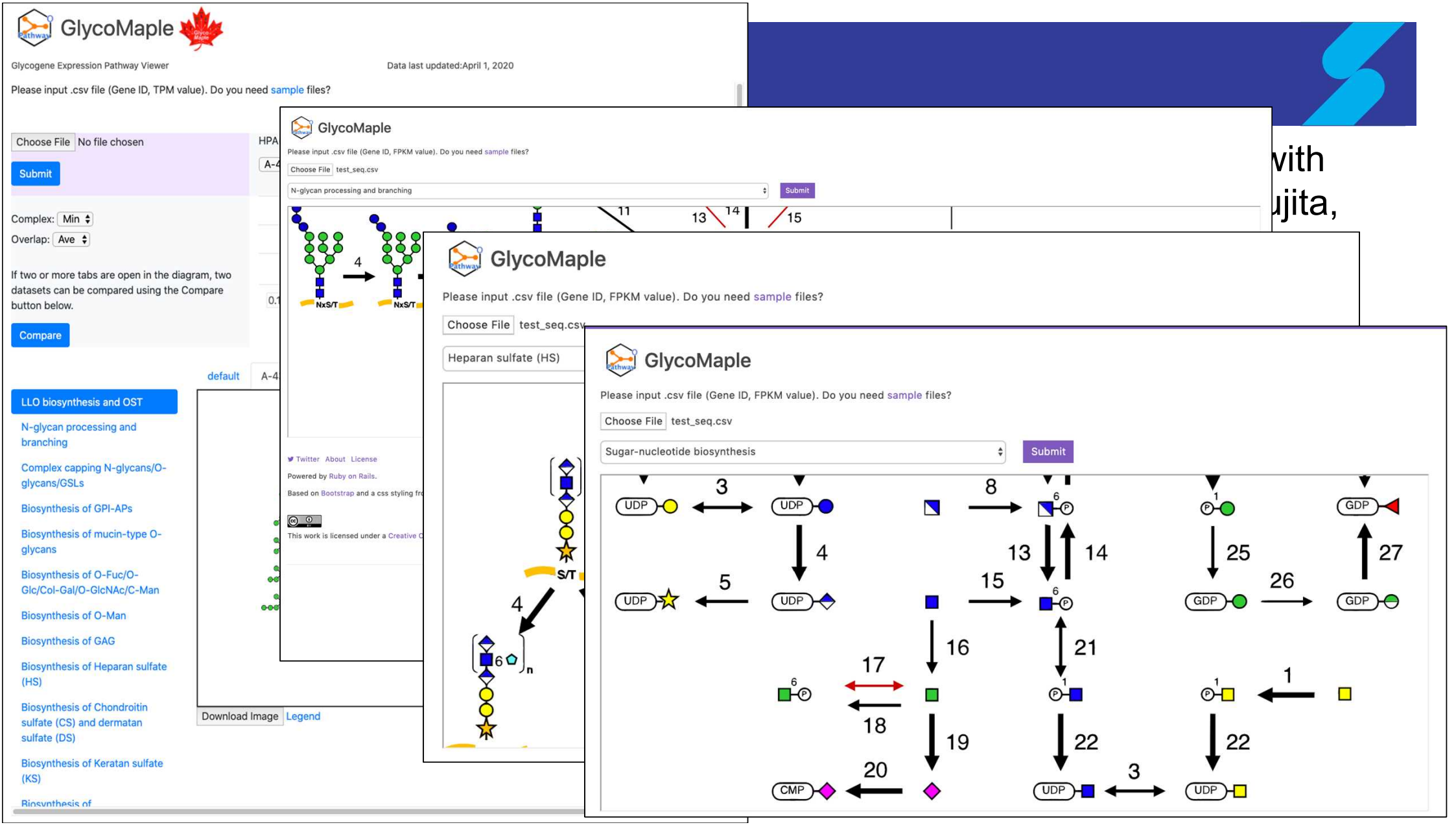


GlyCosmos PubAnnotation

PubMed ID: 10089214

Differential expression of alpha2-6 sialylated G00058MO polylactosamine structures by human B and T fma68646 cells.

We found that human peripheral B and T fma68646 cells differed in the surface expression of alpha2-6 sialylated type 2 chain glycans. In contrast to B fma6864 fma68646 cells, T cells expressed only sialoglycans with repeated G00055MO N-acetyllactosamine (Galss1-4GlcNAc) fma82744 disaccharides. This finding was based on the specificity of the monoclonal fma62871 antibodies HB6, HB9 (P24807 CD24), HD66 (CDw76), FB21, and CRIS4 (CDw76) with the alpha2-6 sialylated model fma82816 gangliosides IV6NeuAcnLc4Cer (2-6 SPG), VI6NeuAcnLc6Cer (2-6 SnHC), VIII6NeuAcnLc8Cer (2-6 SnOC), and X6NeuAcnLc10Cer (2-6 SnDC). We found that, in addition to their common requirement of an alpha2-6 bound terminal G81533KY sialic acid for binding, the fma62871 antibodies displayed preferences for the length of the fma82737 carbohydrate fma13478 backbones. Some of them bound mainly to 2-6 SPG with one G00055MO N-acetyllactosamine (trivialname LacNAc) unit (HB9, HD66); others preferentially to 2-6 SnHC and 2-6 SnOC, with two and three trivialname LacNAc units, respectively (HB6 and FB21); and one of them exclusively to very polar alpha2-6 sialylated type 2 chain antigens (CRIS4) such as to 2-6 SnOC and even more polar fma82816 gangliosides with three and more trivialname LacNAc units. These specificities could be correlated with the cellular binding of the fma62871 antibodies as follows: whereas all fma62871 antibodies bound to human CD 19 positive peripheral B fma68646 cells, their reactivity with CD3 positive T fma68646 cells was either nearly lacking (HD66, HB9), intermediate (about 65%: HB6, FB21) or strongly positive (CRIS4, 95%). Thus, the binding of the fma62871 antibodies to 2-6 sialylated glycans with multiple trivialname lactosamine units appeared to determine their binding to T-fma68646 cells.

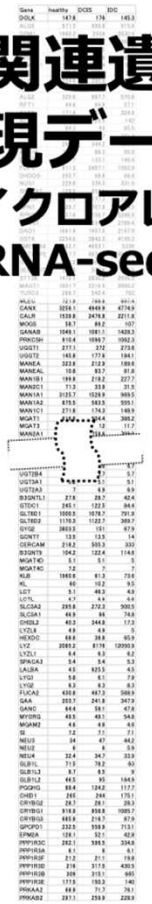

GlycoMaple
Glycogene Expression Pathway Viewer
Data last updated:April 1, 2020
Please input .csv file (Gene ID, TPM value). Do you need sample files?
Choose File No file chosen
Submit
Complex: Min
Overlap: Ave
If two or more tabs are open in the diagram, two datasets can be compared using the Compare button below.
Compare
default
LLO biosynthesis and OST
N-glycan processing and branching
Complex capping N-glycans/O-glycans/GSLs
Biosynthesis of GPI-APs
Biosynthesis of mucin-type O-glycans
Biosynthesis of O-Fuc/O-Glc/Col-Gal/O-GlcNAc/C-Man
Biosynthesis of O-Man
Biosynthesis of GAG
Biosynthesis of Heparan sulfate (HS)
Biosynthesis of Chondroitin sulfate (CS) and dermatan sulfate (DS)
Biosynthesis of Keratan sulfate (KS)
Download Image
Legend
GlycoMaple
Please input .csv file (Gene ID, FPKM value). Do you need sample files?
Choose File test_seq.csv
N-glycan processing and branching
Submit
NxS/T
Twitter About License
Powered by Ruby on Rails.
GlycoMaple
Please input .csv file (Gene ID, FPKM value). Do you need sample files?
Choose File test_seq.csv
Heparan sulfate (HS)
S/T
GlycoMaple
Please input .csv file (Gene ID, FPKM value). Do you need sample files?
Choose File test_seq.csv
Sugar-nucleotide biosynthesis
Submit
UDP
CMP
GDP

with

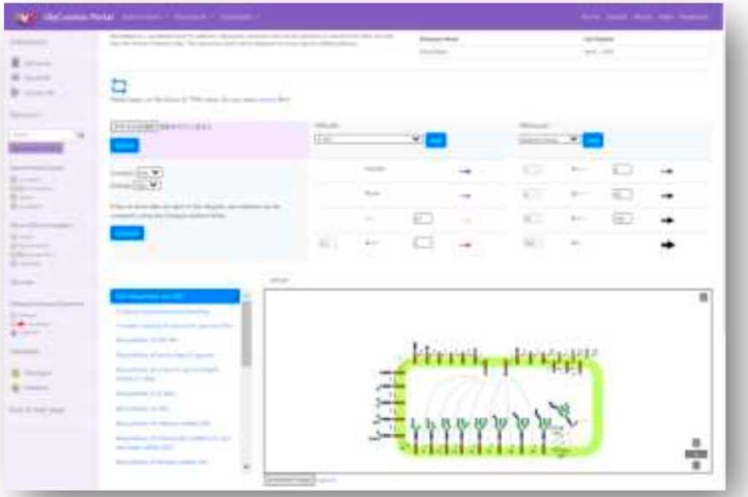
ujita,

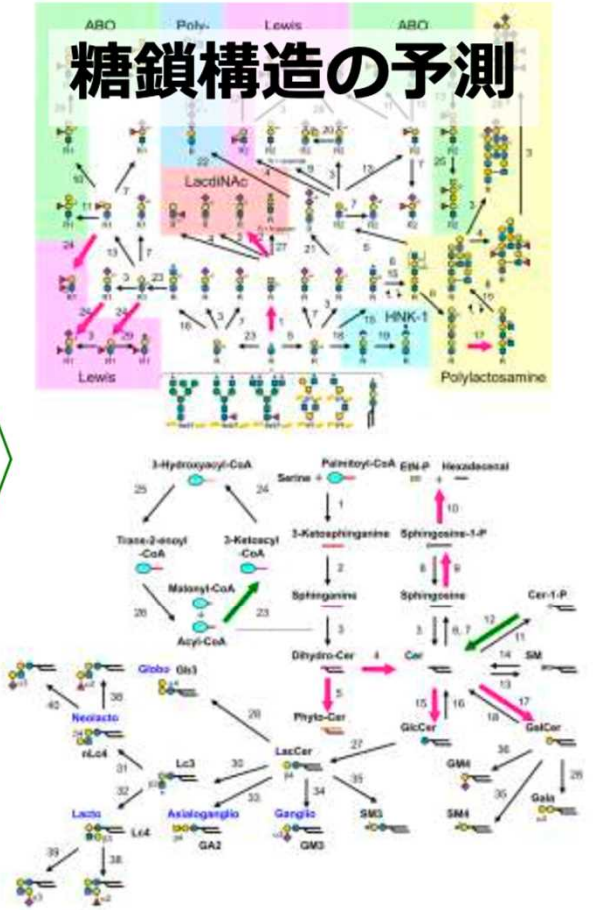
糖鎖遺伝子発現情報を用いたパスウェイ解析

糖鎖関連遺伝子
発現データ
マイクロアレイ
RNA-seq

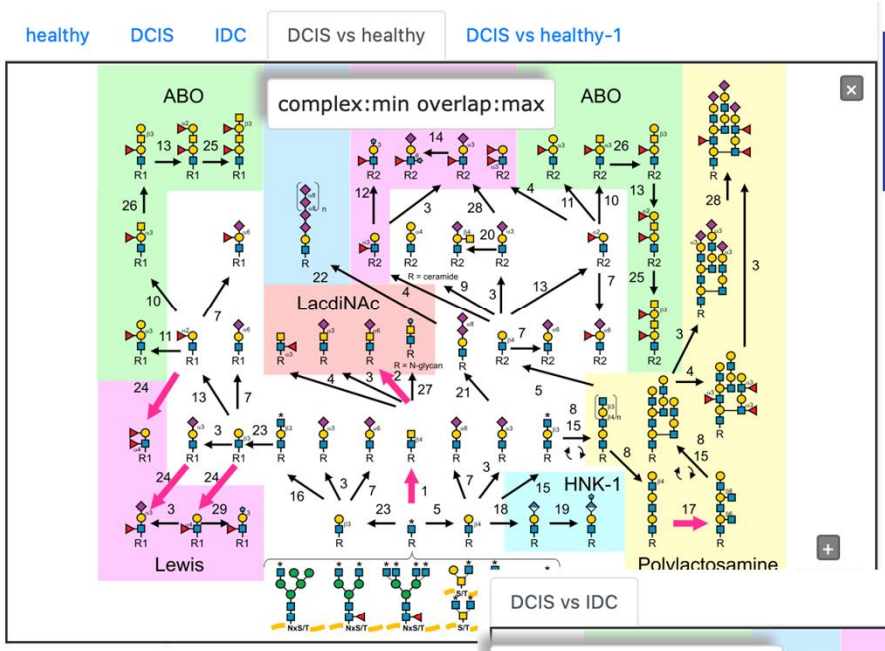


GlycoMaple

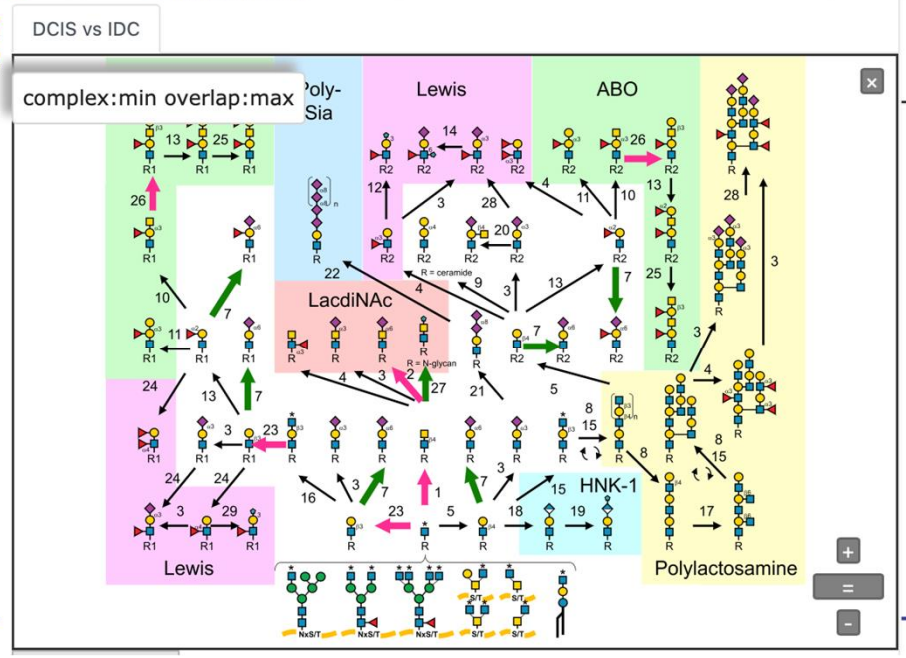




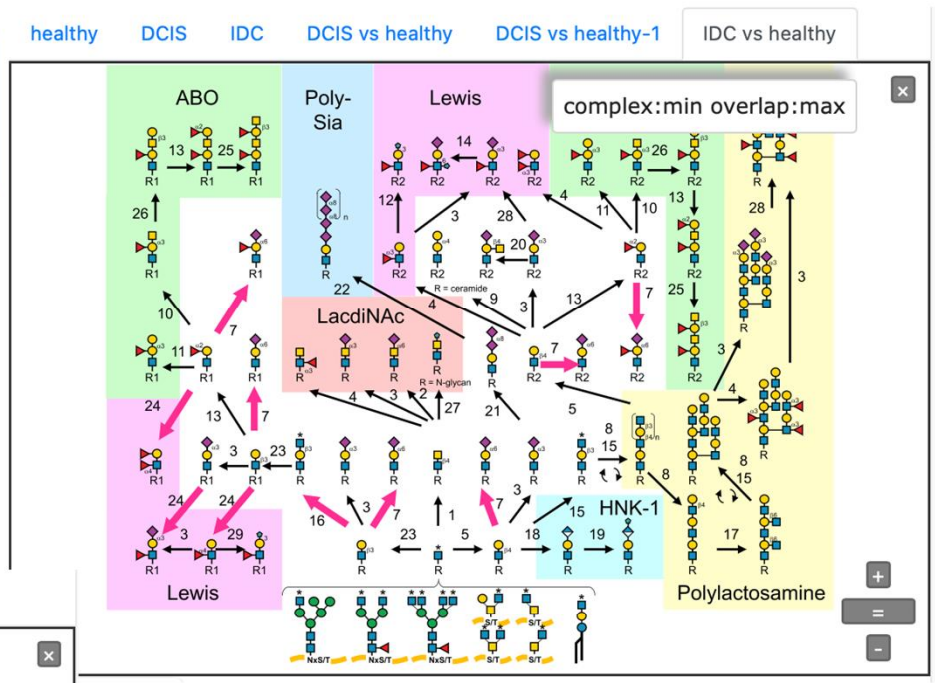
NBDC太田さん：AJACS発表



DCIS vs. healthy



DCIS vs. IDC



IDC vs. healthy

乳管がんで増加する 糖鎖構造を予測
Healthy < DCIS < IDC

NBDC太田さん：AJACS発表

GlyCosmos Organisms

Show 10 entries

To search, enter a keyword in the text box and press Enter (return).

Search across columns

Organism	Taxon ID	Gene	Structure	Protein	Lectin	Pathway
Search						
Gossypium hirsutum	3635	611	6	3	0	0
Salmo salar	8030	566	0	51	0	0
Nicotiana tabacum	4097	515	47	21	0	0
Lingula anatina	7574	446	0	4	0	0
Glycine max	3847	399	38	16	1	0
Juglans regia	51240	340	2	0	0	0
Brassica oleracea var. oleracea	109376	293	0	0	0	0
Scleropages formosus	113540	285	0	19	0	0
Phoenix dactylifera	42345	283	0	0	0	0
Ictalurus punctatus	7998	277	0	30	0	0

Showing 1 to 10 of 21487 entries

Download the displayed table (.tsv) | Download all (.tsv)

Previous 1 2 3 4 5 ... 2149 Next

Line breaks are removed from cells.

Homo sapiens

List of all specie

Show 10

To search, enter

homo

Homo sapien
Phomopsis a
Stenotropho
Trichomonas
Trichomonas
Xanthomonas
Xanthomonas
Xanthomonas
Xanthomonas
Xanthomonas

Showing 1 to 1

Summary

Taxonomy ID: 9606
Common Name: Human

Contents

Glycogenes | Glycans | Glycoproteins | Lectins

GlyCosmos Lectins

Show 10 entries

To search, enter a keyword in the text box and press Enter (return).

Show hidden columns

Lectin Name	UniProt ID	PDB IDs	LfDB IDs	Monosaccharide Specificity	Organism	MCAW IDs
Adhesion G protein-coupled receptor L1	O94910	No data	No data	No data	Homo sapiens	No data
Adhesion G protein-coupled receptor L2	O95490	No data	No data	No data	Homo sapiens	No data
Adhesion G protein-coupled receptor L3	Q9HAR2	5CMN 6VHH	No data	No data	Homo sapiens	No data
Aggrecan core protein	P16112	4MD4	No data	No data	Homo sapiens	No data
Alpha-1,6-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase	Q10469	5VCM 5VCR 5VCS	No data	No data	Homo sapiens	No data

糖鎖関連疾患情報（Ver 2. リリース）

Show 10 entries

Cross Search

Disease ID	Disease Name	Gene Symbol	Gene ID
DOID:0050464	Farber Lipogranulomatosis	ASAH1	427
	Farber Lipogranulomatosis, type 1		
	Farber Lipogranulomatosis, type 2		
	Farber Lipogranulomatosis, type 3		
	Farber Lipogranulomatosis, type 4		
	Farber Lipogranulomatosis, type 5		
DOID:0050560	Fukuyama congenital muscular dystrophy	FKTN	2218
	POMGNT1-CDG (cong. muscular dystrophy spectrum)	POMGNT1	55624
DOID:0050775	SLC35D1-CDG	SLC35D1	23169
DOID:0050802	B4GALT7-CDG	B4GALT7	11285
DOID:0060284	Paroxysmal nocturnal hemoglobinuria		
DOID:0070300	Autosomal recessive multiple epiphyseal dysplasia	SLC26A2	1836
DOID:10581	Metachromatic leukodystrophy	ARSA	410
	Metachromatic leukodystrophy, adult form		
	Metachromatic leukodystrophy, infantile form		
	Metachromatic leukodystrophy, juvenile form		
DOID:10587	Krabbe disease	GALC	2581
	Krabbe disease, infantile form		
	Krabbe disease, late-onset form		
DOID:11054	Bladder Neoplasm		
DOID:11723	Duchenne muscular dystrophy	DMD	1756

Showing 1 to 10 of 357 entries

Previous 1 2 3 ... 36 Next

Resources

Genes / Proteins / Lipids

- Glycogenes
- Glycoproteins
- Lectins
- Glycolipids

Glycans / Glycoconjugates

- Glycans
- Glycoproteins
- Glycolipids

Glycans Search

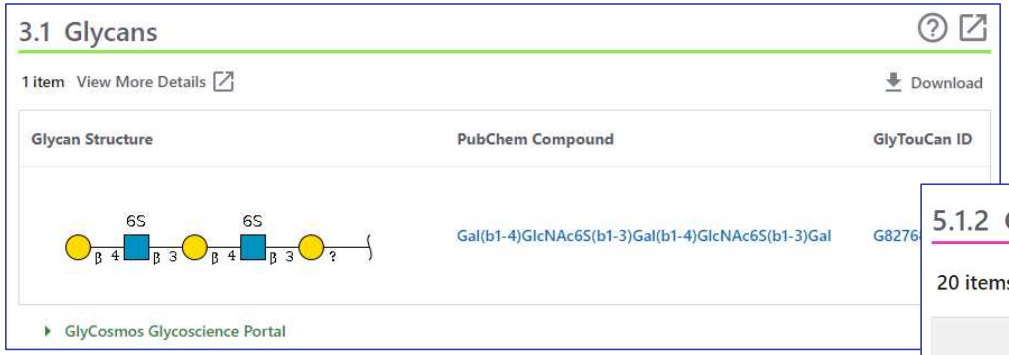
Glycomes

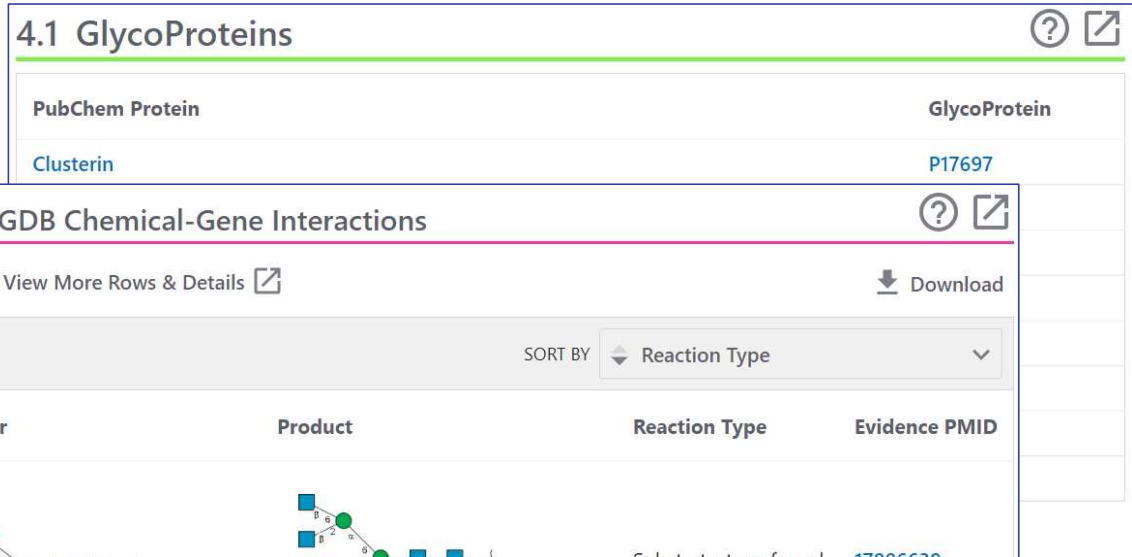
Pathways / Diseases / Organisms

- Pathways
- Diseases
- Organisms

PubChemとの連携

- Reactomeのパスウェイに関わる糖鎖構造や糖タンパク質の情報





- 糖鎖遺伝子が関係する糖鎖構造
  （主に糖転移酵素）

- PubChem RDFデータに
  GlyTouCan IDの導入

今後の予定

- リポジトリの充実：
  - レクチン・マイクロアレイ・リポジトリ：レクチンがどこに発現し、糖鎖構造が局在する部位を登録する
  - 複合糖質のリポジトリGlyComb：現在は当ペプチドのみ、今後糖脂質や糖タンパク質およびグリコシドやglycoRNAも登録可能にする
- データの連携および充実：
  - UniProtやReactome, BioCycなどとの連携を推進する
  - 日本糖質学会におけるジャンボリー
  - キュレーションシステムの活用
  - ヒューマングライコームプロジェクトとの連携
- 微生物データベースとの連携：MiGGA Symposium、オンライン　2022年3月1日～3日
  - **International Symposium on Microbial Glycoconjugates and the GlySpace Alliance: from micro to macro glycoscience**
  - 12月中旬にHPをアップする予定

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SparqLite LLC.

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Japan Science and Technology Agency
NBDC National Bioscience Database Center

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SOKA University