



# 糖鎖科学ポータル GlyCosmos Portal の開発

○塩田正明<sup>1</sup>、小野多美子<sup>1</sup>、細田正恵<sup>1</sup>、土屋伸一郎<sup>1</sup>、クオカ・ズカ<sup>1</sup>、李宣明<sup>1</sup>、三浦信明<sup>2</sup>、平木愛子<sup>2</sup>、渡辺由<sup>3</sup>、安形清彦<sup>4</sup>、藤田典昭<sup>4</sup>、鈴木芳典<sup>4</sup>、新町大輔<sup>5</sup>、青木ポール信行<sup>5</sup>、金進東<sup>6</sup>、奥田修二郎<sup>3</sup>、成松久<sup>4</sup>、山田一作<sup>2</sup>、木下聖子<sup>1</sup>

<sup>1</sup>創価大学、<sup>2</sup>野口研究所、<sup>3</sup>新潟大学、<sup>4</sup>GL-i、<sup>5</sup>SPARQLite、<sup>6</sup>DBCLS



## INTRODUCTION

- GlyCosmos Portal は、リポジトリとデータベースを兼ね備える、糖鎖科学ポータルである。
- 糖鎖、複合糖質（糖タンパク質、糖脂質）、糖鎖関連遺伝子など、関連するデータベースを統合し、ポータルサイトとして情報を提供することを目的としている。
- 我々の開発してきた国際糖鎖構造リポジトリ GlyTouCan[1] により、科学者は糖鎖を登録し、出版物に使用するアクセッション番号を取得することができるようになった[2]。このアクセッション番号を用いれば、GlyTouCan パートナーとして、糖鎖データベースを簡単に相互リンクすることができ、GlyTouCan の糖鎖エントリーページから、各データベースへ繋がることが可能となっている。

- また、GlyCosmos では、GlyTouCan だけでなく、GlyComb と呼ぶ新しい複合糖質構造リポジトリ、そして、グライコプロテオミクスデータのリポジトリである GlycoPOST の開発も進めている。
- さらに、GlyCosmos データベースは、ACGG-DBをはじめ、多くのリソースを統合している。
- 複合糖質や糖鎖関連遺伝子が関与する反応において、糖鎖の位置付けを明確にする GlyCosmos Pathways では、Reactome[3][4] から取得した、糖タンパク質が関与するパスウェイ情報が RDF 形式で格納されており、可視化ツールを開発している。
- また、GlycoNAVI - GlycoAbun では、UniProt によって開発された ProtVista[5] をさらに拡張し、糖鎖付加部位においての存在比と関連情報を可視化できるようになっている。

### Genes/Proteins/Lipids Databases

**Genes**

ACGG Database  
GlycoGene Database (GGDB)  
GGDB is a database which includes genes associated with glycan synthesis such as glycosyltransferase, sugar nucleotide synthases, sugar-nucleotide transporters, and sulfotransferases.  
ACGG Database in ACGG  
https://chgg.aicr.org/

ACGG Database  
Glyco-Disease Genes Database (GGDB)  
GGDB is a database of glycan-related diseases and their responsible genes.  
ACGG Database in ACGG  
https://chgg.aicr.org/

**Proteins**

ACGG Database  
GlycoProDB (GPOB)  
GPOB is a glycoprotein database providing information of Asn (N)-glycosylated proteins and their glycosylated sites, which were constructed by employing a bottom-up strategy using actual glycopeptide sequences identified by LC-MS-based glycoproteomic technologies.  
ACGG Database in ACGG  
https://chgg.aicr.org/

ACGG Database  
Lectin Frontier Database (LFD)  
LFD provides quantitative interaction data in terms of the affinity constants (K<sub>d</sub>) of a series of lectins toward a panel of glycosylated oligo glycans obtained by an automated frontal affinity chromatography with fluorescence detection (FAC-FD) system.  
ACGG Database in ACGG  
https://chgg.aicr.org/

ACGG Database  
GlyCosmos Lectin Database  
GlyCosmos Lectin Database  
Protein entries from POB annotated as lectins in UniProt. Glycosylation site information is also shown where available.  
GlyCosmos Link

ACGG Database  
GlycoAbun  
GlycoAbun is a dataset of abundance ratios for glycans. This is a content of GlycoNAVI.  
GlyCosmos Link

Welcome to GlyCosmos!

As a foundation for integrating glycoscience research, we have started developing the Glycoscience Portal called GlyCosmos.

**Submissions**

GlyTouCan  
GlyComb  
GlycoPOST

**Resources**

Genes/Proteins/Lipids  
Glycans/Glycoconjugates  
Pathways/Diseases  
Ontologies  
Notations

ポスター番号：57  
GlyComb: 複合糖質リポジトリの開発 (新町大輔)

### Glycans/Glycoconjugates Databases

**Glycans**

GlyCosmos Glycans  
Currently, the list of glycans in GlyTouCan.  
GlyCosmos Link

**Glycoconjugates**

ACGG Database  
GlycoProDB (GPOB)  
GPOB is a glycoprotein database providing information of Asn (N)-glycosylated proteins and their glycosylated sites, which were constructed by employing a bottom-up strategy using actual glycopeptide sequences identified by LC-MS-based glycoproteomic technologies.  
ACGG Database in ACGG  
https://chgg.aicr.org/

ACGG Database  
GlycoAbun  
GlycoAbun is a dataset of abundance ratios for glycans. This is a content of GlycoNAVI.  
GlyCosmos Link

ポスター番号：56  
GlycoNAVI: 疾患と複合糖質の糖鎖量比変化データベースの構築 (平木愛子)

### Pathways/Diseases Databases

**Pathways**

GlyCosmos Pathways Database  
GlyCosmos Pathways  
Pathways from Reactome containing glycoproteins as annotated in UniProt.  
GlyCosmos Link

**Diseases**

ACGG Database  
Glyco-Disease Genes Database (GGDB)  
GGDB is a database of glycan-related diseases and their responsible genes.  
ACGG Database in ACGG  
https://chgg.aicr.org/

ACGG Database  
Pathogen Adherence to Carbohydrate Database (PACDB)  
PACDB provides the information on pathogens (e.g. bacteria, fungus, toxin and virus) adhering to carbohydrate expressed on the cell surface of host animals or plants.  
ACGG Database in ACGG  
https://chgg.aicr.org/

### GlyCosmos Lectin Database

**Lectins list**

Protein	UniProt	EC	Scientific Name	Reference
1,2-α-D-glucanase	Q53223	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53224	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53225	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53226	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53227	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53228	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53229	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53230	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53231	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53232	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53233	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53234	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53235	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53236	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53237	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53238	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53239	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53240	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53241	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53242	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53243	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53244	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53245	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53246	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53247	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53248	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53249	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53250	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53251	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53252	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53253	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53254	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53255	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53256	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53257	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53258	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53259	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53260	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53261	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53262	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53263	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53264	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53265	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53266	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53267	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53268	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53269	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53270	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53271	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53272	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53273	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53274	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53275	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53276	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53277	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53278	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53279	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53280	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53281	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53282	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53283	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53284	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53285	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53286	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53287	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53288	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53289	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53290	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53291	3.2.1.20	Bacillus anthracis (strain Ames)	14147
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1,2-α-D-glucanase	Q53334	3.2.1.20	Bacillus anthracis (strain Ames)	14147
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1,2-α-D-glucanase	Q53336	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53337	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53338	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53339	3.2.1.20	Bacillus anthracis (strain Ames)	14147
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1,2-α-D-glucanase	Q53343	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53344	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53345	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53346	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53347	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53348	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53349	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53350	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53351	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53352	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53353	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53354	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53355	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53356	3.2.1.20	Bacillus anthracis (strain Ames)	14147
1,2-α-D-glucanase	Q53357	3.2.1.20</		