Full wwPDB EM Validation Report ⓘ

Oct 1, 2024 – 05:47 PM JST

PDB ID	:	8JXH
EMDB ID	:	EMD-36701
Title	:	rat megalin RAP complex wingA
Authors	:	Goto, S.; Tsutsumi, A.; Lee, Y.; Hosojima, M.; Kabasawa, H.; Komochi, K.; Yun-san, L.; Nagatoshi, S.; Tsumoto, K.; Nishizawa, T.; Kikkawa, M.; Saito, A.
Deposited on	:	2023-06-30
Resolution	:	3.50 Å(reported)
Based on initial model	:	.

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

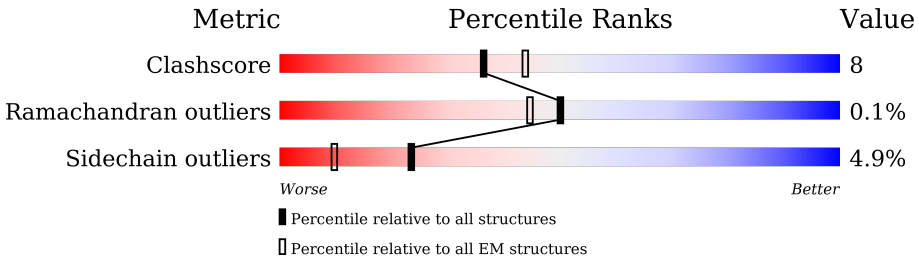
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	D	332	13% 23% 8% 68%
2	A	4660	97%
2	B	4660	20% 5% 75%
3	Q	6	100%
4	R	5	80% 20%
5	C	2	50% 100%
5	F	2	100% 100%
6	E	3	33% 67%

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Mol	Chain	Length	Quality of chain
7	G	5	

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 11503 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Alpha-2-macroglobulin receptor-associated protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	D	105	Total	C	N	O	0	0
			895	563	163	169		

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	29	GLY	-	expression tag	UNP Q99068
D	30	PRO	-	expression tag	UNP Q99068
D	31	LEU	-	expression tag	UNP Q99068
D	32	GLY	-	expression tag	UNP Q99068
D	33	SER	-	expression tag	UNP Q99068

- Molecule 2 is a protein called LDL receptor related protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	151	Total	C	N	O	S	0	0
			1149	680	202	246	21		
2	B	1166	Total	C	N	O	S	0	0
			9047	5545	1608	1786	108		

- Molecule 3 is a protein called unclear peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	Q	6	Total	C	N	O	0	0
			30	18	6	6		

- Molecule 4 is a protein called unclear peptide.

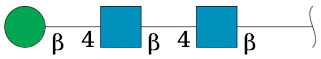
Mol	Chain	Residues	Atoms				AltConf	Trace
4	R	5	Total	C	N	O	0	0
			28	16	6	6		

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-a

cetamido-2-deoxy-beta-D-glucopyranose.

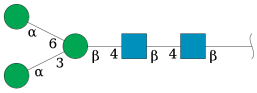
Mol	Chain	Residues	Atoms				AltConf	Trace
5	C	2	Total	C	N	O	0	0
			28	16	2	10		
5	F	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 6 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



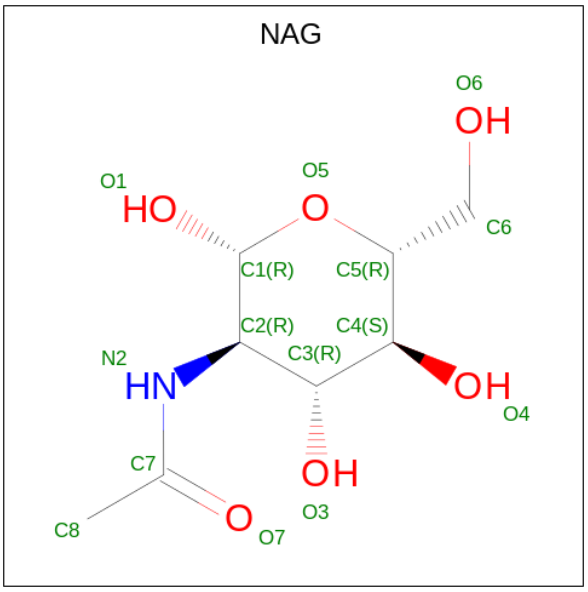
Mol	Chain	Residues	Atoms				AltConf	Trace
6	E	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



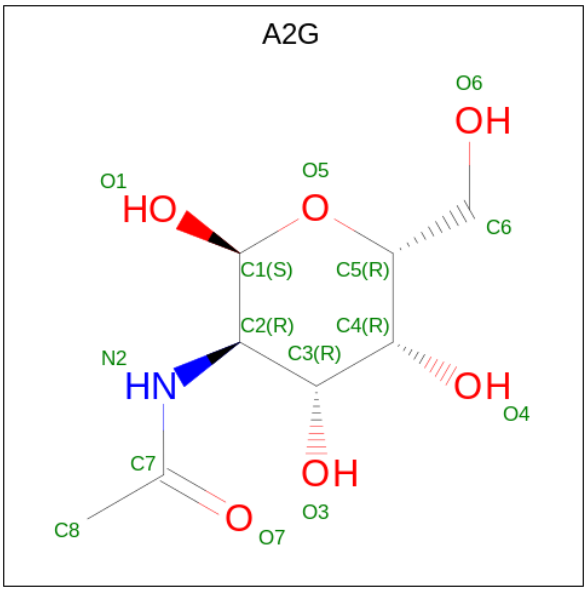
Mol	Chain	Residues	Atoms				AltConf	Trace
7	G	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms	AltConf
8	A	1	Total C N O 14 8 1 5	0
8	A	1	Total C N O 14 8 1 5	0
8	B	1	Total C N O 14 8 1 5	0
8	B	1	Total C N O 14 8 1 5	0

- Molecule 9 is 2-acetamido-2-deoxy-alpha-D-galactopyranose (three-letter code: A2G) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
9	A	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0

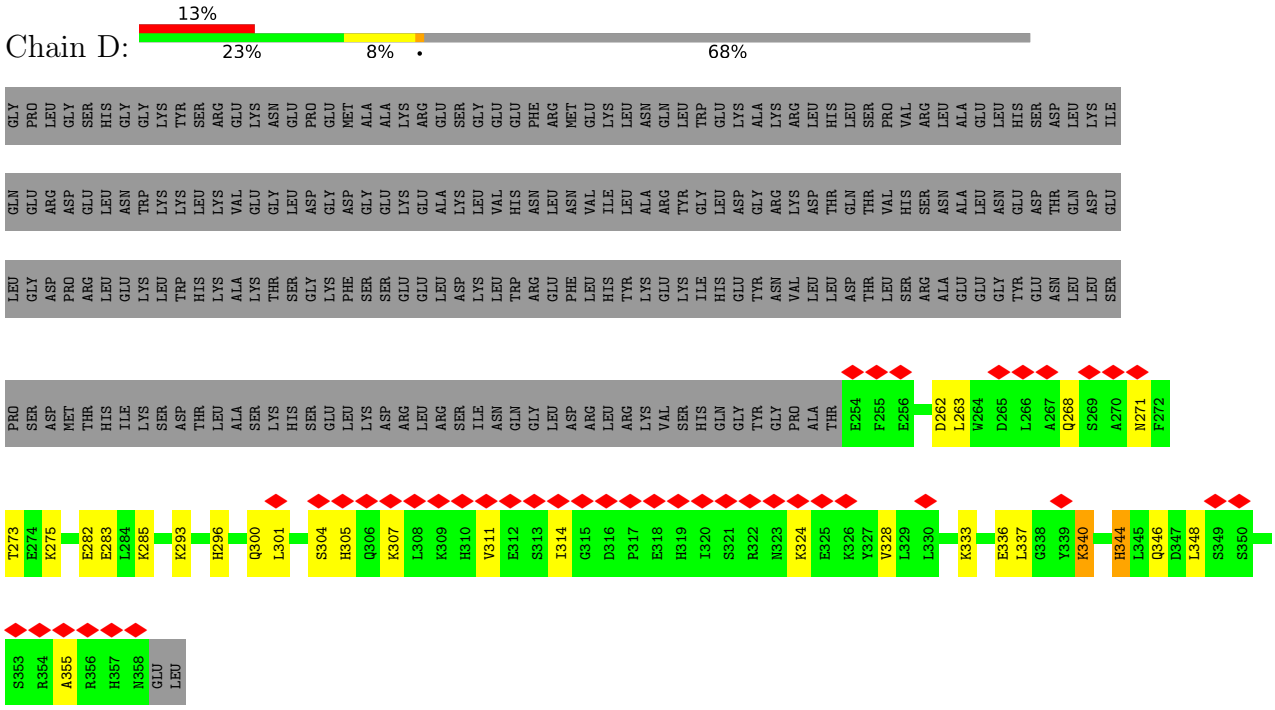
- Molecule 10 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
10	A	4	Total 4	Ca 4	0
10	B	12	Total 12	Ca 12	0

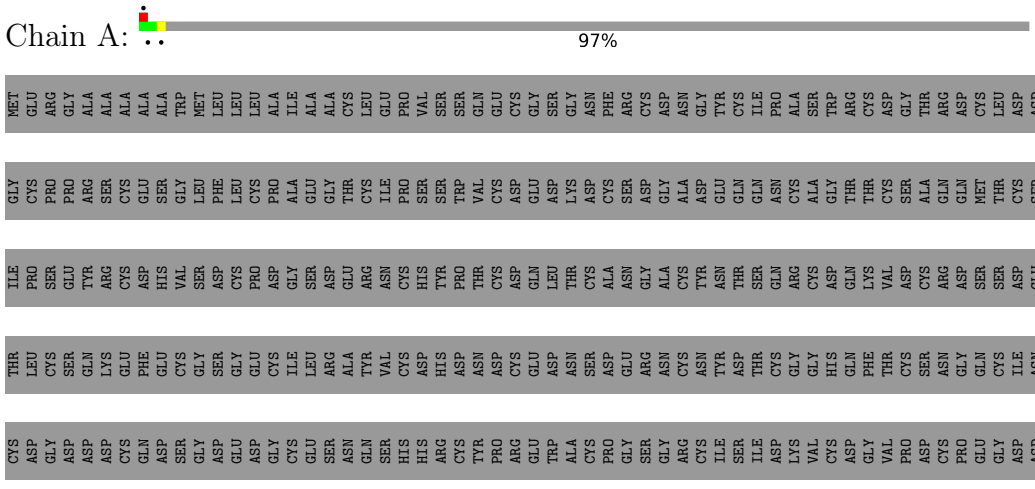
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Alpha-2-macroglobulin receptor-associated protein



• Molecule 2: LDL receptor related protein 2



THR SER GLY ARG THR CYS GLY MET GLY VAL CYS SER VAL LEU ASN CYS GLU TYR GLN CYS HIS GLN THR PRO PHE GLY GLY GLU CYS PHE CYS PRO PRO GLY HIS ILE ILE ASN SER ASN ASP SER ARG THR CYS ILE ASP PHE ASP ASP CYS GLN ILE TRP GLY ILE CYS ASP GLN LYS

CYS GLU ASN ARG GLN GLY ARG HIS GLN CYS LEU CYS GLU GLU GLY TYR ILE LEU GLU ARG GLY GLN HIS CYS LYS SER SER ASP SER PHE SER ALA ALA SER VAL ILE PHE SER ASN GLY ARG ASP LEU LEU VAL GLY ASP LEU HIS GLY ARG ASN PHE ARG ILE LEU ALA GLU SER LYS

ASN ARG GLY MET VAL MET GLY VAL ASP PHE HIS TYR GLN LYS HIS ARG VAL PHE TRP THR ASP PRO MET GLN GLU LYS VAL PHE SER THR ASP ILE ASN GLY LEU ASN THR GLN GLU ILE LEU ASN VAL SER VAL ASP THR PRO GLU ASN LEU ALA VAL ASP TRP ILE ASN ASN LYS LEU

TYR LEU VAL GLU THR LYS VAL ASN ARG ILE ASP VAL VAL ASN LEU GLU GLY ASN GLN ARG VAL THR LEU ILE THR GLU ASN LEU GLY HIS PRO ARG GLY ILE ALA LEU ASP PRO THR VAL GLY TYR LEU PHE PHE SER ASP TRP GLY SER LEU SER GLY GLN PRO LYS VAL GLU ARG ALA

PHE MET ASP GLY SER ASN ARG LYS ASP LEU VAL THR THR LYS VAL GLY TRP PRO ALA GLY ILE THR LEU ASP LEU VAL SER LYS ARG VAL TYR TRP VAL ASP SER ARG TYR ASP TYR ILE GLU THR VAL THR TYR ASP GLY ILE GLN ARG LYS THR VAL ALA ARG GLY GLY SER LEU VAL

PRO HIS PRO PHE GLY ILE SER LEU PHE GLU GLU HIS VAL PHE PHE THR ASP TRP THR LYS MET ALA VAL MET LYS ALA SER LYS PHE THR GLU THR ASN PRO GLN VAL TYR HIS GLN SER SER LEU ARG PRO HIS GLY VAL THR VAL TYR HIS ALA LEU ARG GLN PRO ASN ALA THR ASN

PRO CYS GLY SER ASN ASN GLY GLY CYS ALA GLN VAL CYS VAL LEU SER HIS ARG THR ASP ASN GLY GLY LEU GLY TYR ARG CYS LYS CYS GLU PHE GLY PHE GLU LEU ASP ASP ASP GLU HIS ARG CYS VAL ALA VAL LYS ASN PHE LEU LEU PHE SER SER LYS THR ALA VAL ARG GLY

ILE PRO PHE THR LEU SER THR GLN GLU ASP VAL MET VAL PRO VAL THR GLY SER PRO SER PHE PHE VAL GLY ILE ASP PHE ASP ALA GLN HIS SER THR VAL PHE TYR SER ASP LEU SER LYS ASP ILE ILE TYR LYS GLN LYS ILE ASP GLY THR GLY LYS GLU VAL ILE THR ALA ASN

ARG LEU GLU SER VAL GLU CYS LEU THR PHE ASP TRP ILE SER ARG ASN LEU TYR TRP THR ASP GLY GLY LEU LYS SER VAL THR VAL LEU ARG LEU ALA ASP LYS SER ARG ARG GLN ILE ILE SER ASN LEU ASN ASN PRO ARG SER ILE VAL VAL HIS PRO THR ALA GLY TYR MET PHE

LEU SER ASP TRP PHE ARG PRO ALA LYS ILE MET ARG ALA TRP SER ASP GLY SER HIS LEU MET PRO ILE VAL ASN THR SER LEU GLY TRP PRO ASN GLY LEU ALA ILE ASP TRP SER ALA SER ARG LEU TYR TRP VAL ASP ALA PHE PHE ASP LYS ILE GLU HIS SER THR LEU ASP GLY

LEU ASP ARG LYS ARG LEU GLY HIS VAL ASP GLN MET THR HIS PRO PHE GLY LEU THR VAL PHE LYS ASP ASN VAL PHE ILE THR ASP TRP ARG LEU GLY ALA ILE ILE ARG VAL ARG LYS SER ASP GLY GLY ASP MET THR VAL ILE ARG ARG GLY ILE SER SER VAL MET HIS VAL LYS

ALA TYR ASP ALA ASP LEU GLN THR GLY SER ASN TYR CYS SER GLN THR THR HIS ALA ASN GLY ASP CYS SER HIS PHE CYS PHE PRO VAL PRO ASN PHE GLN ARG VAL CYS GLY CYS PRO TYR GLY MET LYS LEU GLN ARG ASP GLN MET THR CYS GLU GLY ASP PRO ALA ARG GLU PRO

PRO THR GLN GLN CYS GLY SER LEU SER PHE PRO CYS ASN ASN GLY LYS CYS VAL PRO SER PHE PHE ARG CYS ASP GLY VAL ASP ASP CYS HIS ASP ASN SER ASP GLU HIS GLN CYS GLY VAL PHE ASN ASN THR CYS SER PRO SER ALA PHE ALA CYS VAL ARG GLY GLY GLN CYS ILE

PRO GLY GLN TRP HIS CYS ASP ARG GLN ASN ASP CYS LEU ASP GLY SER ASP GLU GLN ASN CYS PRO THR HIS ALA THR SER SER THR CYS PRO SER THR SER PHE THR CYS ASP ASN HIS VAL CYS ILE PRO LYS ASP TRP VAL CYS ASP THR ASP ASN ASP CYS SER ASP GLY SER ASP

GLU LYS ASN CYS GLN ALA SER GLY THR CYS GLN PRO THR GLN PHE ARG CYS PRO ASP HIS ARG CYS ILE SER PRO LEU TYR VAL CYS ASP GLY ASP LYS ASP CYS ALA ASP GLY SER ASP GLU ALA GLY CYS VAL LEU ASN CYS THR SER ALA GLN PHE LYS CYS ALA ASP GLY SER SER

CYS ILE ASN SER ARG TYR ARG CYS ASP GLY VAL TYR ASP CYS ARG ASP ASN SER ASP GLU ALA GLY CYS PRO THR ARG PRO PRO GLY MET CYS HIS LEU ASP GLU PHE GLN CYS GLN GLY ASP GLY THR CYS ILE PRO ASN THR TRP GLU CYS ASP GLY HIS PRO ASP CYS ILE HIS GLY

SER ASP GLU HIS THR GLY CYS VAL PRO LYS THR CYS SER PRO THR HIS PHE LEU CYS ASP ASN GLY ASN CYS ILE TYR LYS ALA TRP ILE CYS ASP GLY ASP ASN ASP CYS ARG ASP MET SER ASP GLU LYS ASP CYS PRO THR GLN PRO PHE HIS CYS PRO SER THR GLN TRP GLN CYS

PRO GLY TYR SER THR CYS ILE ASN LEU SER ALA LEU CYS ASP GLY VAL PHE ASP CYS PRO ASN GLY THR ASP GLU SER PRO LEU CYS ASN GLN ASP SER CYS SER HIS PHE ASN GLY GLY CYS THR HIS GLN CYS MET GLN GLY PRO PHE GLY ALA THR CYS LEU CYS PRO LEU GLY TYR

GLN LEU ALA ASN ASP THR LYS THR CYS GLU ASP ILE ASN GLU CYS ASP ILE PRO GLY PHE CYS SER GLN HIS CYS VAL ASN MET ARG GLY SER PHE ARG CYS ALA CYS ASP PRO GLU TYR THR LEU GLU SER ASP GLY ARG THR CYS LYS VAL THR GLY SER GLU ASN PRO LEU LEU VAL

VAL ALA SER ARG ASP LYS ILE ILE VAL ASP ASN ILE THR ALA HIS THR HIS ASN LEU TYR SER LEU VAL GLN ASP VAL SER PHE VAL VAL ALA LEU ASP PHE ASP SER VAL THR GLY ARG VAL PHE TRP SER ASP LEU LEU GLN GLY LYS THR TRP SER VAL PHE GLN ASN GLY THR ASP

LYS ARG VAL VAL HIS ASP SER GLY LEU SER VAL THR GLU MET ILE ALA VAL ASP TRP ILE GLY ARG ASN LEU TYR TRP THR ASP TYR ALA LEU GLU THR ILE GLU VAL SER LYS ILE ASP GLY SER HIS ARG THR VAL LEU ILE SER LYS ASN VAL THR LYS PRO ARG GLY LEU ALA LEU

ASP PRO ARG MET GLY ASP ASN VAL MET PHE TRP SER ASP TRP GLY HIS HIS PRO ARG ILE GLU ARG ALA SER MET ASP GLY THR MET ARG THR VAL ILE VAL GLN GLU LYS ILE TYR TRP PRO CYS GLY LEU SER ILE ASP TYR PRO ASN ARG LEU ILE TYR PHE MET ASP ALA TYR LEU

ASP TYR ILE GLU PHE CYS ASP TYR ASP GLY HIS ASN ARG ARG GLN VAL ILE ALA SER ASP LEU VAL LEU HIS HIS PRO HIS ALA LEU THR LEU PHE GLU ASP PHE VAL TYR TRP THR ASP ARG GLY THR ARG GLN VAL MET GLN ALA ASN LYS TRP HIS GLY GLY ASN GLN SER VAL VAL

MET TYR SER VAL HIS GLN PRO LEU GLY ILE THR ALA ILE HIS PRO SER ARG GLN PRO PRO SER ARG ASN PRO CYS ALA SER ALA SER CYS SER HIS LEU CYS LEU LEU SER ALA GLN ALA PRO ARG HIS TYR SER CYS ALA CYS PRO SER GLY TRP ASN LEU SER ASP ASP SER VAL ASN

CYS VAL ARG GLY ASP GLN PRO PHE LEU MET SER VAL ARG ASP ASN ILE ILE PHE GLY ILE SER LEU ASP PRO GLU VAL LYS SER ASN ASP ALA MET VAL PRO ILE SER GLY ILE GLN HIS GLY TYR ASP VAL GLU PHE ASP ASP SER GLU GLN PHE ILE TYR TRP VAL GLU ASN PRO GLY

GLU ILE HIS ARG VAL LYS THR ASP GLY SER ASN ARG THR VAL PHE ALA PRO LEU SER LEU LEU GLY SER SER LEU GLY LEU ALA LEU ASP TRP VAL SER ARG ASN ILE TYR TYR THR THR PRO ALA SER ARG SER ILE GLU VAL LEU THR LEU LYS GLY ASP THR ARG TYR GLY LYS THR

LEU ILE ALA ASN ASP GLY THR PRO LEU GLY VAL GLY PHE PRO VAL GLY ILE ALA VAL ASP PRO ALA ARG GLY LYS LEU TYR TRP SER ASP HIS GLY THR ASP SER GLY VAL PRO ALA LYS ILE ALA SER ALA ASN MET ASP GLY THR SER LEU LYS ILE LEU PHE THR GLY ASN LEU GLN

HIS LEU GLU VAL VAL THR LEU ASP ILE GLN GLU GLN LYS LEU TYR TRP ALA VAL THR SER ARG GLY VAL ILE GLU ARG GLY ASN VAL ASP GLY THR GLU ARG MET ILE LEU VAL HIS HIS LEU ALA HIS PRO TRP GLY LEU VAL VAL TYR GLY SER PHE LEU TYR TYR SER ASP GLU GLN

TYR GLU VAL ILE GLU ARG VAL ASP LYS SER SER GLY ASN ASN LYS VAL VAL LEU ARG ASP ASN VAL PRO TYR LEU ARG GLY LEU ARG VAL TYR HIS ARG ARG ASN ALA ALA ASP SER SER ASN GLY CYS SER ASN ASN PRO ASN ALA CYS GLN GLN ILE CYS LEU PRO VAL PRO GLY GLY

MET PHE SER CYS ALA CYS ALA SER GLY PHE LYS LEU SER PRO ASP GLY ARG SER CYS SER PRO TYR ASN SER PHE MET VAL VAL SER MET LEU PRO ALA VAL ARG GLY PHE SER LEU GLU LEU SER ASP HIS SER GLU ALA MET VAL PRO VAL ALA GLY GLN GLY ARG ASN VAL LEU HIS

ALA ASP VAL ASP VAL ALA ASN GLY PHE ILE TYR TRP CYS ASP PHE SER SER SER VAL ARG SER SER ASN GLY ILE ARG ARG ILE LYS PRO ASP GLY SER ASN PHE THR ASN VAL VAL THR TYR GLY ILE GLY ALA ASN GLY ILE ARG GLY VAL ALA LEU ASP TRP ALA ALA GLY ASN LEU

TYR PHE THR ASN ALA PHE VAL TYR GLU THR LEU ILE GLU VAL LEU ARG ILE ASN THR THR TYR ARG ARG VAL LEU LEU LYS VAL SER VAL ASP MET PRO ARG HIS ILE ILE VAL ASP PRO LYS HIS ARG TYR LEU PHE TRP ALA ASP TYR GLY GLN LYS PRO LYS ILE GLU ARG SER PHE

LEU ASP CYS THR ASN ARG THR VAL LEU VAL SER GLU GLY ILE VAL THR PRO ARG GLY LEU ALA MET ASP HIS ASP THR GLY TYR ILE TYR TRP VAL ASP ASP SER LEU ASP LEU ILE ALA ARG ILE HIS LEU ASP GLY GLY GLU SER GLN VAL VAL ARG TYR GLY SER ARG TYR PRO THR

PRO TYR GLY ILE THR VAL PHE GLY GLU SER ILE ILE TRP VAL ASP ARG ASN LEU LYS LYS VAL PHE GLN ALA SER LYS GLN PRO GLY ASN THR ASP PRO PRO VAL VAL ILE ARG ASP LYS ILE ASN LEU LEU ARG ASP VAL THR ILE PHE ASP GLU HIS ALA GLN PRO LEU SER PRO ALA

GLU LEU ASN ASN PRO CYS LEU GLN SER ASN GLY GLY CYS SER HIS PHE CYS PHE ALA LEU PRO GLU LEU PRO THR PRO ARG CYS GLY CYS ALA PHE GLY THR LEU GLY ASN ASP GLY LYS SER CYS ALA THR SER GLN GLU ASP PHE LEU ILE TYR SER LEU ASN ASN SER LEU ARG

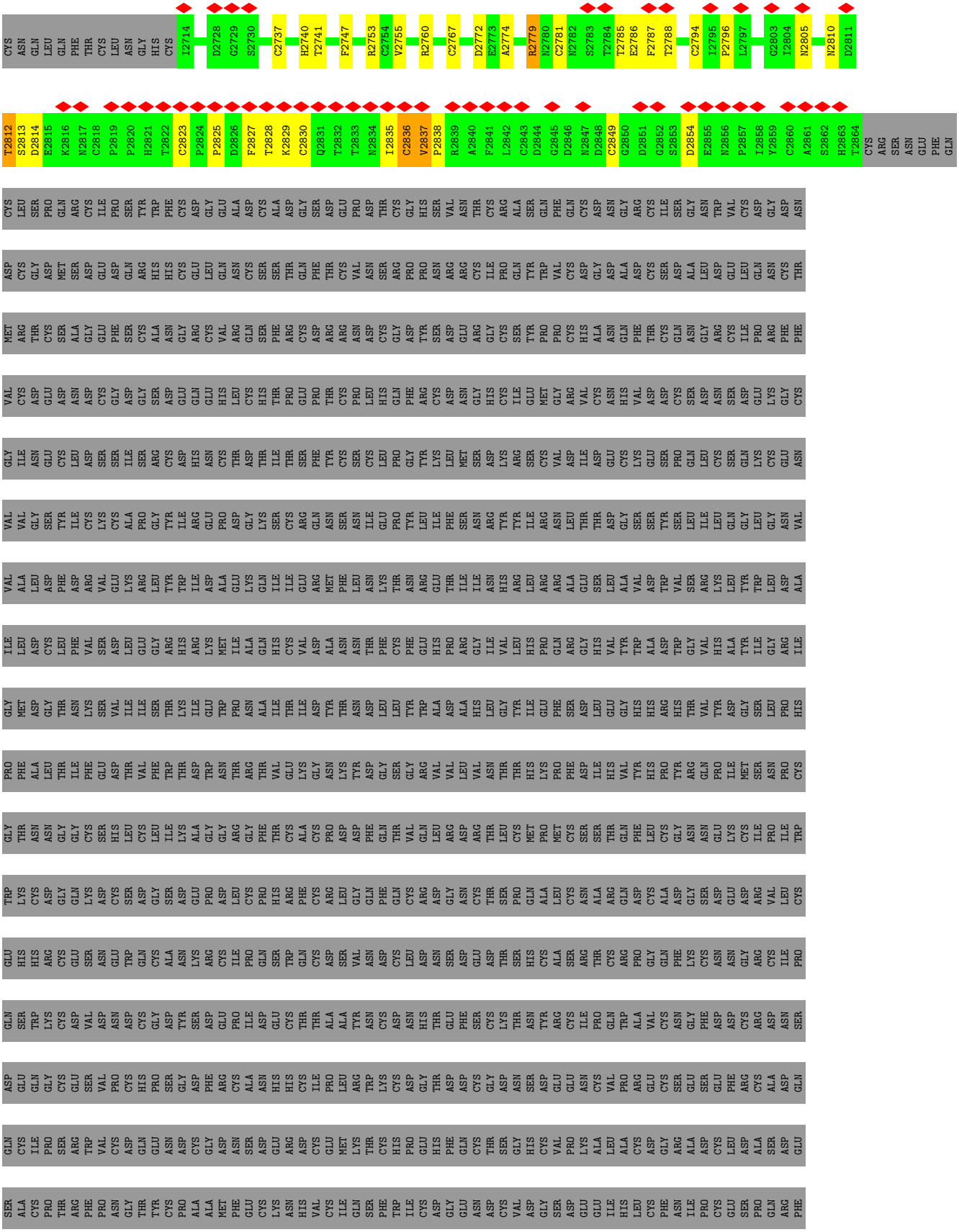
SER LEU HIS PHE ASP PRO ARG ASP HIS SER LEU PRO PHE GLN VAL ILE SER VAL ALA GLY THR ALA ILE ALA LEU ASP TYR ASP ARG ASN ASN ARG ILE PHE PHE THR GLN LYS LEU ASN SER LEU ARG GLY GLN ILE SER TYR VAL SER LEU TYR SER GLY SER SER SER PRO THR

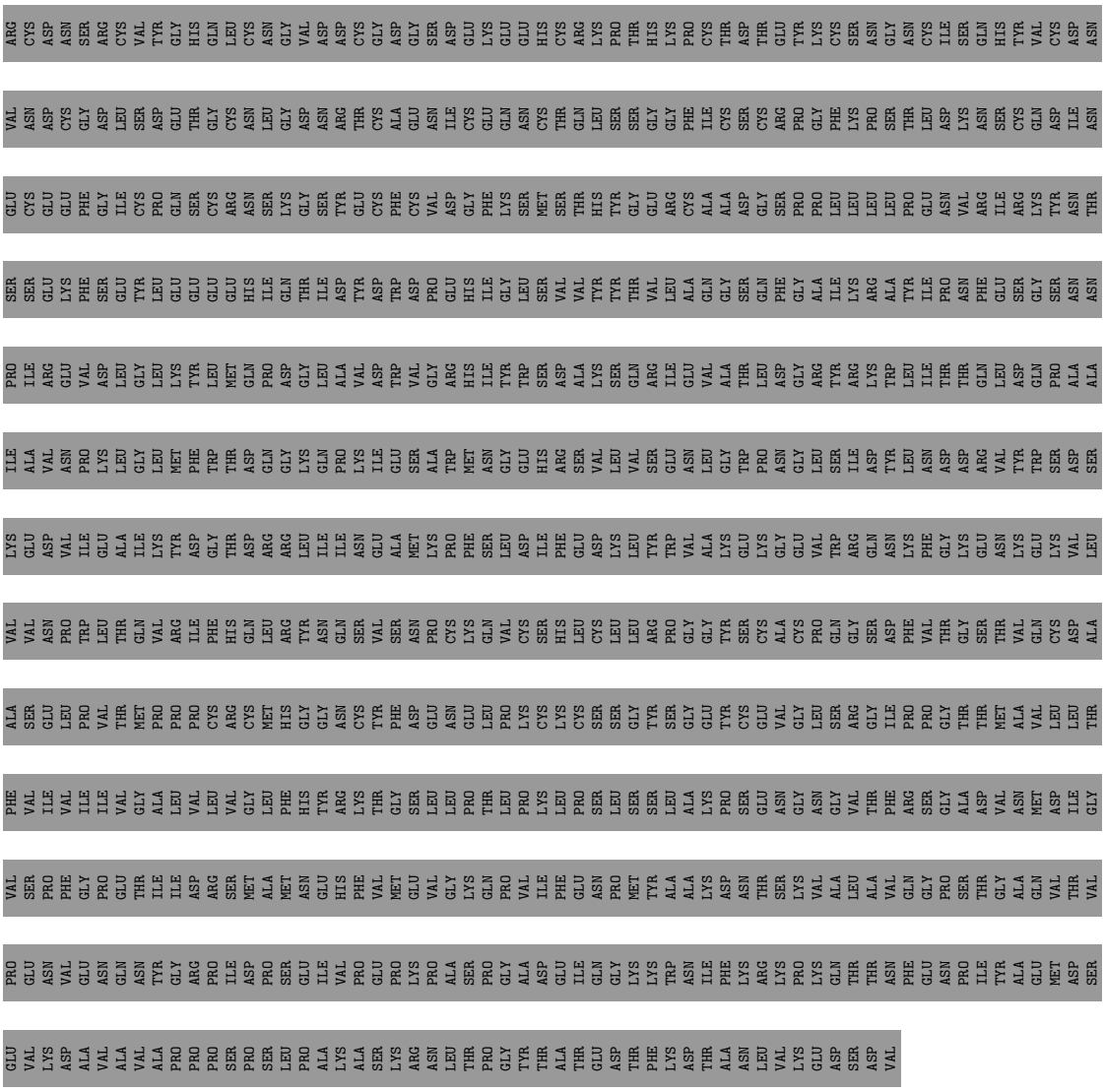
VAL LEU LEU SER ASN ILE GLY VAL THR ASP GLY ILE ALA PHE ASP TRP ILE ASN ARG ARG ILE TYR TYR SER ASP PHE SER ASN GLN THR ILE ASN SER MET ALA GLU ASP GLY SER ASN ARG ALA VAL ILE ALA ARG VAL SER LYS PRO ARG ALA ILE VAL LEU ASP PRO CYS ARG GLY

TYR MET TYR TRP THR ASP TRP GLY THR ASN ALA LYS ILE GLU ARG ALA THR LEU GLY GLY ASN PHE ARG VAL PRO ILE VAL ASN THR SER LEU VAL TRP PRO ASN GLY LEU ALA LEU ASP LEU GLU THR ASP LEU LEU TYR TRP ALA ASP ALA SER LEU GLN LYS ILE GLU ARG SER THR

LEU THR GLY THR ASN ARG GLU VAL VAL SER THR ALA PHE HIS SER PHE GLY LEU THR VAL TYR GLY GLN TYR ILE TYR TRP THR ASP LEU TYR THR ARG LYS ILE TYR ARG ALA ASN LYS TYR ASP GLY SER ASP LEU VAL ALA MET THR THR ARG LEU PRO THR GLN PRO SER GLY

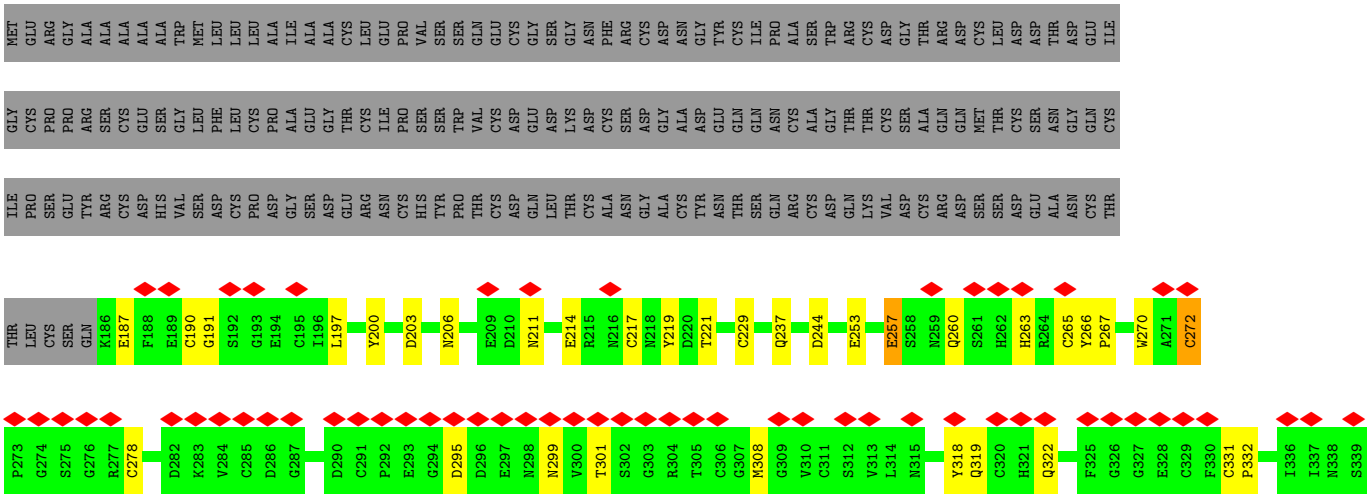
ILE SER THR VAL VAL LYS THR GLN ARG GLN GLN CYS SER ASN PRO CYS ASP GLN PHE ASN GLY GLY CYS SER HIS ILE CYS ALA PRO GLY PRO ASN GLY ALA GLU CYS GLN CYS PRO HIS GLU GLY ASN TRP TYR LEU ALA ASN ASP ASN LYS TYR CYS VAL VAL ASP THR GLY THR ARG

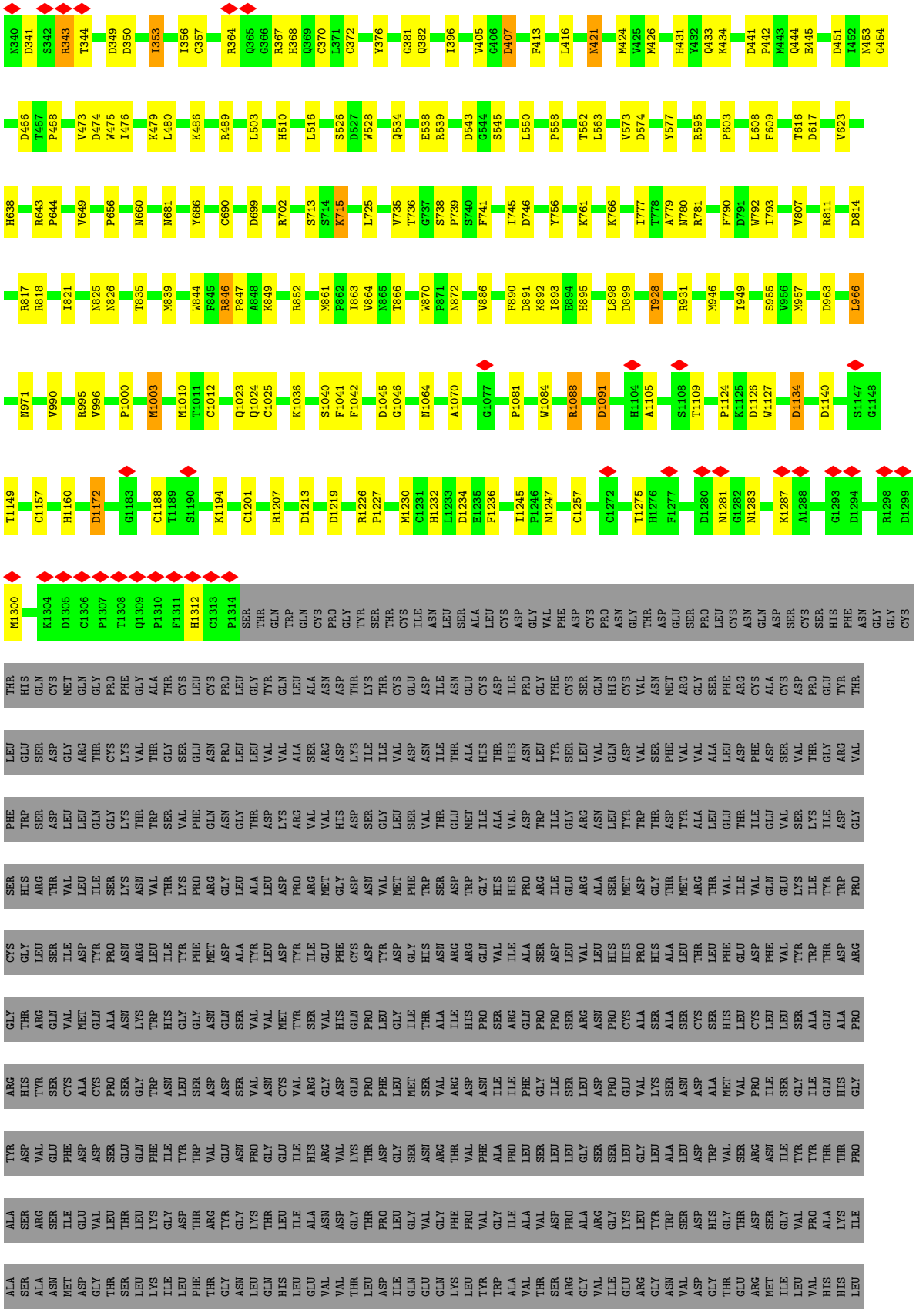

CYS ASN GLN LEU GLN PHE THR CYS LEU ASN GLY HIS CYS I2714 D2728 G2729 S2730 C2737 H2740 T2741 F2747 R2753 C2754 V2755 R2760 C2767 D2772 E2773 A2774 R2779 N2780 C2781 N2782 S2783 T2784 T2785 E2786 F2787 T2788 C2794 I2795 P2796 L2797 G2803 I2804 N2805 N2810 D2811
T2812 S2813 D2814 E2815 K2816 N2817 C2818 P2819 P2820 H2821 T2822 C2823 P2824 P2825 D2826 F2827 T2828 K2829 C2830 Q2831 T2832 T2833 N2834 I2835 C2836 V2837 P2838 R2839 A2840 F2841 L2842 C2843 D2844 G2845 D2846 N2847 D2848 C2849 G2850 D2851 G2852 S2853 D2854 E2855 N2856 P2857 I2858 Y2859 C2860 A2861 S2862 H2863 T2864 CYS ARG SER ASN GLU PHE GLN
CYS LEU SER PRO GLN ARG CYS ILE PRO SER TYR TRP PHE CYS ASP GLY GLU ALA ASP CYS ALA ASP GLY SER ASP GLU PRO ASP THR CYS GLY HIS SER VAL ASN THR CYS ARG ALA SER GLN PHE GLN CYS ASP ASN GLY ARG CYS ILE SER GLY ASN TRP VAL CYS ASP GLY GLU LEU GLN ASN
ASP CYS GLY ASP MET SER ASP GLU ASP GLN ARG HIS HIS CYS GLU LEU GLN ASN CYS SER SER THR GLN PHE THR CYS VAL ASN SER ARG CYS GLY HIS PRO PRO ASN ARG ARG CYS ILE PRO GLN TYR TRP VAL CYS ASP GLY ASP ALA ASP CYS SER ILE SER ASP ALA LEU ASP GLU LEU GLN ASN CYS THR
MET ARG THR CYS SER ALA GLY GLU PHE SER CYS ALA ASN GLY ARG CYS VAL ARG GLN SER PHE ARG CYS ASP ARG ARG ASN ASP CYS GLY ASP TYR SER ASP GLU ARG GLY CYS SER TYR PRO PRO CYS HIS ALA ASN GLN PHE THR CYS GLN ASN GLY GLY ARG CYS ILE PRO ARG PHE PHE
VAL CYS ASP GLU ASP ASN GLY SER ASP GLU GLN GLU HIS LEU CYS HIS THR PRO GLU PRO THR CYS PRO LEU HIS GLN PHE ARG CYS ASP ASN GLY HIS CYS ILE GLU MET GLY ARG VAL CYS ASN HIS VAL ASP ASP CYS SER ASP SER ASN ASP GLU ASP CYS GLY LYS GLY CYS
GLY ILE ASN GLU CYS LEU ASP SER SER ILE SER ARG CYS ASP HIS ASN CYS THR ASP THR ILE THR SER PHE TYR CYS SER CYS LEU PRO GLY TYR LYS LEU MET SER ASP LYS ARG SER CYS VAL ASP ILE ASP GLU CYS LYS SER GLU CYS LYS GLU ASN
VAL VAL GLY SER TYR ILE CYS LYS CYS ALA PRO GLY TYR ILE ARG GLU PRO ASP GLY LYS GLN ILE SER CYS ARG GLN ASN SER ASN ILE GLU PRO TYR LEU ILE PHE SER ASN ARG TYR TYR ILE ARG ASN LEU THR THR ASP GLY SER SER TYR SER LEU ILE LEU GLN GLY LEU GLY ASN VAL
VAL ALA LEU ASP PHE ASP ARG VAL GLU LYS ARG LEU TYR TRP ILE ASP ALA ALA GLU LYS GLN ILE ILE GLU GLU ARG MET PHE LEU ASN LYS THR ASN ARG GLU GLU THR ILE ASP ARG LEU ARG ARG ALA GLU SER LEU ALA VAL ASP TRP VAL THR ARG ALA LYS LEU TYR TRP LEU ASP ALA
ILE LEU ASP CYS LEU PHE VAL SER ASP LEU GLU GLY ARG HIS ARG LYS MET ILE ALA GLN HIS CYS VAL ASP ALA ASN ASN THR PHE CYS PHE GLU HIS PRO GLN ARG GLY HIS VAL THR TRP ALA ASP TRP VAL PHE ASP GLY SER GLY LEU VAL HIS ALA TYR THR ILE GLY ARG ILE
GLY MET ASP GLY THR ASN LYS SER VAL ILE ILE SER THR LYS ILE GLU TRP PRO ASN ALA ILE THR ILE ASP TYR THR ASN ASP LEU LEU LEU TYR TRP ALA ASP ALA HIS LEU GLY TYR ILE GLU PHE SER ASP LEU GLU GLY HIS HIS ARG HIS THR VAL TYR ALA ASP LEU GLY PRO HIS
PRO PHE ALA LEU THR ILE PHE GLU ASP THR VAL PHE TRP THR ASP TRP ASN THR ARG THR VAL GLU LYS GLY ASN LYS TYR ASP GLY SER GLY ARG VAL VAL LEU ASN THR THR HIS LYS PRO PHE ASP ILE HIS VAL TYR HIS PRO TYR ARG GLN PRO ILE MET SER ASN PRO CYS
GLY THR ASN ASN GLY GLY CYS SER HIS LEU CYS LEU ILE LYS ALA GLY ARG GLY PHE THR CYS ALA CYS PRO ASP ASP PHE GLN THR VAL GLN LEU ARG ASP ARG THR LEU CYS MET PRO MET CYS SER SER THR GLN PHE LEU CYS GLY ASN ASN GLU LYS CYS ILE PRO ILE TRP
TRP LYS CYS ASP GLY GLN LYS ASP SER ASP GLU PRO ASP ASP LEU CYS PRO PRO HIS ARG PHE CYS ARG LEU GLY GLN PHE GLN CYS ARG ASP ASP GLY ASN CYS THR SER PRO GLN ALA LEU CYS ASN ALA ARG GLN ASP CYS ALA ASP GLY GLN PRO GLU ASP ARG VAL LEU CYS
GLU HIS HIS ARG CYS GLU TRP GLN CYS ASP SER VAL ASN ASP CYS LEU ASP ASP SER ASP GLU ASP THR SER THR HIS CYS ALA SER ARG THR CYS ARG GLN PRO GLY GLN PHE LYS CYS ASN ASN GLY ARG CYS ILE PRO
GLN SER TRP LYS CYS ASP VAL ASP ASN THR ALA TYR ASN CYS ASP ASN HIS THR GLU PHE SER CYS LYS THR ASN TYR ARG CYS ILE PRO GLN TRP ALA VAL CYS ASN HIS GLY ASP PHE ASP ASP CYS ARG ASP ASP SER
ASP GLU GLN GLY CYS HIS PRO SER GLY ASP PHE ARG CYS ALA ASN HIS HIS CYS ILE PRO LEU ARG TRP LYS CYS ASP GLY THR ASP ASP CYS GLY ASP SER ASP GLU GLU ASN CYS SER GLU SER GLU PHE ASP CYS GLY ASP ASN ALA ASP GLN
GLN CYS ILE ASP GLN GLU CYS ASP HIS PRO GLU HIS PHE GLN CYS THR SER GLY ASP ASN GLU CYS VAL PRO LYS ALA LEU ALA CYS ASP GLY ARG GLU CYS SER ASN GLY THR ALA ALA SER GLU PHE ARG CYS ASP ASP SER
SER ALA CYS PRO THR ARG PHE PRO ASN GLY THR TYR CYS PRO ALA ALA MET PHE GLU CYS CYS LYS ASN HIS VAL CYS ILE GLN LEU SER PHE TRP ILE CYS ASP GLY GLU ASN ASP CYS GLY SER ASP GLU ILE HIS LEU CYS PHE ASN ILE PRO CYS GLU SER ARG ASP PHE



• Molecule 2: LDL receptor related protein 2

Chain B:

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D466 T467 P468 V473 D474 W475 I476 K479 L480 K486 R489 L503 H510 L516 S526 D527 W528 Q534 E538 R539 D543 G544 S545 L550 P558 T562 L563 V573 D574 Y577 R595 P603 L608 F609 T616 D617 V623
H638 R643 P644 V649 P656 N660 N681 Y686 C690 D699 R702 S713 S714 K715 L725 V735 T736 G737 S738 P739 S740 F741 I745 D746 Y756 K761 K766 I777 T778 A779 N780 R781 F790 D791 W792 I793 V807 R811 D814
R817 R818 I821 N825 N826 T835 M839 W844 F845 R846 P847 A848 K849 R852 M861 P862 I863 V864 N865 T866 W870 P871 N872 V886 F890 D891 K892 I893 E894 H895 L898 D899 T928 R931 M946 I949 S955 V956 M957 D963 L966
N971 V990 R995 V996 P1000 M1003 M1010 T1011 C1012 Q1023 Q1024 C1025 K1036 S1040 F1041 F1042 D1045 G1046 N1064 A1070 G1077 P1081 W1084 R1088 D1091 H1104 A1105 S1108 T1109 P1124 K1125 D1126 W1127 D1134 D1140 S1147 G1148
T1149 C1157 H1160 D1172 G1183 C1188 T1189 S1190 K1194 C1201 R1207 D1213 D1219 R1226 P1227 M1230 C1231 H1232 L1233 D1234 E1235 F1236 I1245 P1246 N1247 C1257 G1272 T1275 H1276 F1277 D1280 N1281 G1282 N1283 K1287 A1288 G1293 D1294 R1298 D1299
M1300 K1304 D1305 C1306 P1307 T1308 Q1309 P1310 F1311 H1312 C1313 P1314 SER THR GLN TRP GLN CYS PRO GLY TYR SER THR CYS ILE ASN LEU SER ALA LEU CYS ASP GLY VAL PHE ASP CYS SER GLN PRO ASN GLY THR ASP GLU SER PRO LEU CYS ASN GLN ASP SER CYS SER HIS PHE ASN GLY GLY CYS
THR HIS GLN CYS MET GLN GLY PRO PHE GLY ALA THR CYS LEU CYS PRO LEU GLY TYR GLN LEU ALA ASN ASP THR LYS THR CYS GLU ASP ILE ASN GLU CYS ASP ILE PRO GLY PHE CYS SER GLN HIS CYS VAL ASN MET ARG GLY SER PHE ARG CYS ALA CYS ASP PRO GLU TYR THR
LEU GLU SER ASP GLY ARG THR CYS LYS VAL THR GLY SER GLU ASN PRO LEU LEU VAL VAL ALA SER ARG ASP LYS ILE ILE VAL ASP ASN ILE THR ALA HIS THR HIS ASN LEU TYR SER LEU VAL GLN ASP VAL SER PHE VAL VAL ALA LEU ASP PHE ASP SER VAL THR GLY ARG VAL
PHE TRP SER ASP LEU LEU GLN GLY LYS THR TRP SER VAL PHE GLN ASN GLY THR ASP LYS ARG VAL VAL HIS ASP SER GLY LEU GLU MET ILE ALA VAL ASP TRP ILE GLY ARG ASN LEU TYR TRP THR ASP TYR ALA LEU GLU THR ILE GLU VAL SER LYS ILE ASP GLY
SER HIS ARG THR VAL LEU ILE SER LYS ASN VAL THR LYS PRO ARG GLY LEU ALA LEU ASP PRO ARG MET GLY ASP ASN VAL MET PHE TRP SER ASP TRP GLY HIS HIS PRO ARG ILE GLU ARG ALA SER MET ASP GLY THR MET ARG THR VAL ILE VAL GLN GLU LYS ILE TYR TRP PRO
CYS GLY LEU SER ILE ASP TYR PRO ASN ARG LEU ILE TYR PHE MET ASP ALA TYR LEU ASP TYR ILE GLU PHE CYS ASP TYR ASP GLY HIS ASN ARG ARG GLN VAL ILE ALA SER ASP LEU VAL LEU HIS HIS PRO HIS ALA LEU THR LEU PHE GLU ASP PHE VAL TYR SER LYS TRP PRO
GLY THR ARG GLN VAL MET TYR SER VAL HIS GLN PRO LEU GLY ILE THR ALA ILE HIS PRO SER ARG GLN PRO PRO SER ARG ASN PRO CYS ALA SER ALA LEU SER CYS SER HIS LEU CYS LEU LEU SER GLY ILE GLN ALA PRO
ARG HIS TYR SER CYS ALA CYS PRO SER GLY TRP ASN LEU SER ASP ASP SER VAL ASN CYS VAL ARG GLY ASP GLN PRO PHE LEU MET SER VAL ARG ASP ASN ILE ILE PHE GLY ILE SER LEU ASP PRO GLU VAL LYS SER ASN ASP ALA MET VAL PRO ILE SER GLY ILE GLN HIS GLY
TYR ASP VAL GLU PHE ASP ASP SER GLU GLN PHE ILE TYR TRP VAL GLU ASN PRO GLY GLU ILE HIS ARG VAL LYS THR ASP GLY SER ASN ARG THR VAL PHE ALA PRO LEU SER LEU LEU GLY SER SER LEU GLY LEU ALA LEU ASP TRP VAL SER ARG ASN ILE TYR TYR THR THR PRO
ALA SER ARG SER ILE GLU VAL LEU THR LEU LYS GLY ASP THR ARG TYR GLY LYS THR LEU HIS LEU GLU VAL ASP GLY THR PRO LEU GLY VAL GLY PHE PRO VAL GLY ILE ALA VAL THR SER ARG GLY VAL ILE GLU GLY ARG GLY ASN VAL ASP GLY THR GLU ASP ARG MET ILE LEU VAL HIS HIS LEU
ALA SER ALA ASN MET ASP GLY THR SER LEU GLN LEU PHE THR GLY ASN LEU GLN HIS LEU GLU VAL VAL THR LEU ASP ILE GLN GLU GLN LYS LEU TYR TRP ALA VAL THR SER ARG GLY VAL ILE GLU GLY ARG GLY ASN VAL ASP GLY THR GLU ARG MET ILE LEU VAL HIS HIS LEU

ALA HIS PRO TRP GLY LEU VAL VAL TYR GLY SER PHE LEU TYR TYR SER ASP GLU GLN TYR GLU VAL ILE GLU ARG VAL ASP LYS SER SER GLY ASN ASN LYS VAL VAL LEU ARG ASP ASN VAL PRO TYR LEU ARG GLY LEU ARG VAL TYR HIS ARG ARG ASN ALA ALA ASP SER SER ASN

GLY CYS SER ASN ASN PRO ASN ALA CYS GLN GLN ILE CYS LEU PRO VAL PRO GLY GLY MET PHE SER CYS ALA CYS ALA SER GLY PHE LYS LEU SER PRO ASP GLY ARG SER CYS SER PRO TYR ASN SER PHE MET VAL VAL SER MET LEU PRO ALA VAL ARG GLY PHE SER LEU GLU LEU

SER ASP HIS SER GLU ALA MET VAL PRO VAL ALA GLY GLN GLY ARG ASN VAL LEU HIS ALA ASP VAL ASP VAL ALA ASN GLY PHE ILE TYR TRP CYS ASP PHE SER SER SER VAL ARG SER SER ASN GLY ILE ARG ARG ILE LYS PRO ASP GLY SER ASN PHE THR ASN VAL VAL THR TYR

GLY ILE GLY ALA ASN GLY ILE ARG GLY VAL ALA LEU ASP TRP ALA ALA GLY ASN LEU TYR PHE THR ASN ALA PHE VAL TYR GLU THR LEU ILE GLU VAL LEU ARG ILE ASN THR THR TYR ARG ARG VAL LEU LEU LYS VAL SER VAL ASP MET PRO ARG HIS ILE ILE VAL ASP PRO LYS

HIS ARG TYR LEU PHE TRP ALA ASP TYR GLY GLN LYS PRO LYS ILE GLU ARG SER PHE LEU ASP CYS THR ASN ARG THR VAL LEU VAL SER GLU GLY ILE VAL THR PRO ARG GLY LEU ALA MET ASP HIS ASP THR GLY TYR ILE TYR TRP VAL ASP ASP SER LEU ASP LEU ILE ALA ARG

ILE HIS LEU ASP GLY GLY GLU SER GLN VAL VAL ARG TYR GLY SER ARG TYR PRO THR PRO TYR GLY ILE THR VAL PHE GLY GLU SER ILE ILE TRP VAL ASP ARG ASN LEU LYS LYS VAL PHE GLN ALA SER LYS GLN PRO GLY ASN THR ASP PRO PRO VAL VAL ILE ARG ASP LYS ILE

ASN LEU LEU ARG ASP VAL THR ILE PHE ASP GLU HIS ALA GLN PRO LEU SER PRO ALA GLU LEU ASN ASN PRO CYS LEU GLN SER ASN GLY GLY CYS SER HIS PHE CYS PHE ALA LEU PRO GLU LEU PRO THR PRO ARG CYS GLY CYS ALA PHE GLY THR LEU GLY ASN ASP GLY LYS

SER CYS ALA THR SER GLN GLU ASP PHE LEU ILE TYR SER LEU ASN ASN SER LEU ARG SER LEU HIS PHE ASP PRO ARG ASP HIS SER LEU PRO PHE GLN VAL ILE SER VAL ALA GLY THR ALA ILE ALA LEU ASP TYR ASP ARG ASN ASN ARG ILE PHE PHE THR GLN LYS LEU ASN

SER LEU ARG GLY GLN ILE SER TYR VAL SER LEU TYR SER GLY SER SER PRO THR VAL LEU LEU SER ASN ILE GLY VAL THR ASP GLY ILE ALA PHE ASP TRP ILE ASN ARG ARG ILE TYR TYR SER ASP PHE SER ASN GLN THR ILE ASN SER MET ALA GLU ASP GLY SER ASN ARG

ALA VAL ILE ALA ARG VAL SER LYS PRO ARG ALA ILE VAL LEU ASP PRO CYS ARG GLY TYR MET TYR TRP THR ASP TRP GLY THR ASN ALA LYS ILE GLU ARG ALA THR LEU GLY GLY ASN PHE ARG VAL PRO ILE VAL ASN THR SER LEU VAL TRP PRO ASN GLY LEU ALA LEU ASP LEU

GLU THR ASP LEU LEU TYR TRP ALA ASP ALA SER LEU GLN LYS ILE GLU ARG SER THR LEU THR GLY THR ASN ARG GLU VAL VAL VAL SER THR ALA PHE HIS SER PHE GLY LEU THR VAL TYR GLY GLN TYR ILE TYR TRP THR ASP LEU TYR THR ARG LYS ILE TYR ARG ALA ASN LYS

TYR ASP GLY SER ASP LEU VAL ALA MET THR THR ARG LEU PRO THR GLN PRO SER GLY ILE SER THR VAL VAL LYS THR GLN ARG GLN GLN CYS SER ASN PRO CYS ASP GLN PHE ASN GLY GLY CYS SER HIS ILE CYS ALA PRO GLY PRO ASN GLY ALA GLU CYS GLN CYS PRO HIS GLU

GLY ASN TRP TYR LEU ALA ASN ASP ASN LYS TYR CYS VAL VAL ASP THR GLY THR ARG CYS ASN GLN LEU GLN PHE THR CYS LEU ASN GLY HIS CYS ILE ASN GLN ASP TRP LYS CYS ASP ASN ASP ASN ASP CYS GLY ASP GLY SER ASP GLU LEU PRO THR VAL CYS ALA PHE HIS THR

CYS ARG SER THR ALA PHE THR CYS GLY ASN GLY ARG CYS VAL PRO TYR HIS TYR ARG CYS ASP TYR TYR ASN ASP CYS GLY ASP ASN SER ASP GLU ALA GLY CYS LEU PHE ARG ASN CYS ASN SER THR THR GLU PHE THR CYS SER ASN GLY ARG CYS ILE PRO LEU SER TYR VAL CYS

ASN GLY ILE ASN ASN CYS HIS ASP ASN ASP THR SER ASP GLU LYS ASN CYS PRO PRO HIS THR CYS PRO PRO ASP PHE THR LYS CYS GLN THR THR ASN ILE CYS VAL PRO ARG ALA PHE LEU CYS ASP GLY ASP ASN ASP CYS GLY ASP GLY SER ASP GLU ASN PRO ILE TYR CYS ALA

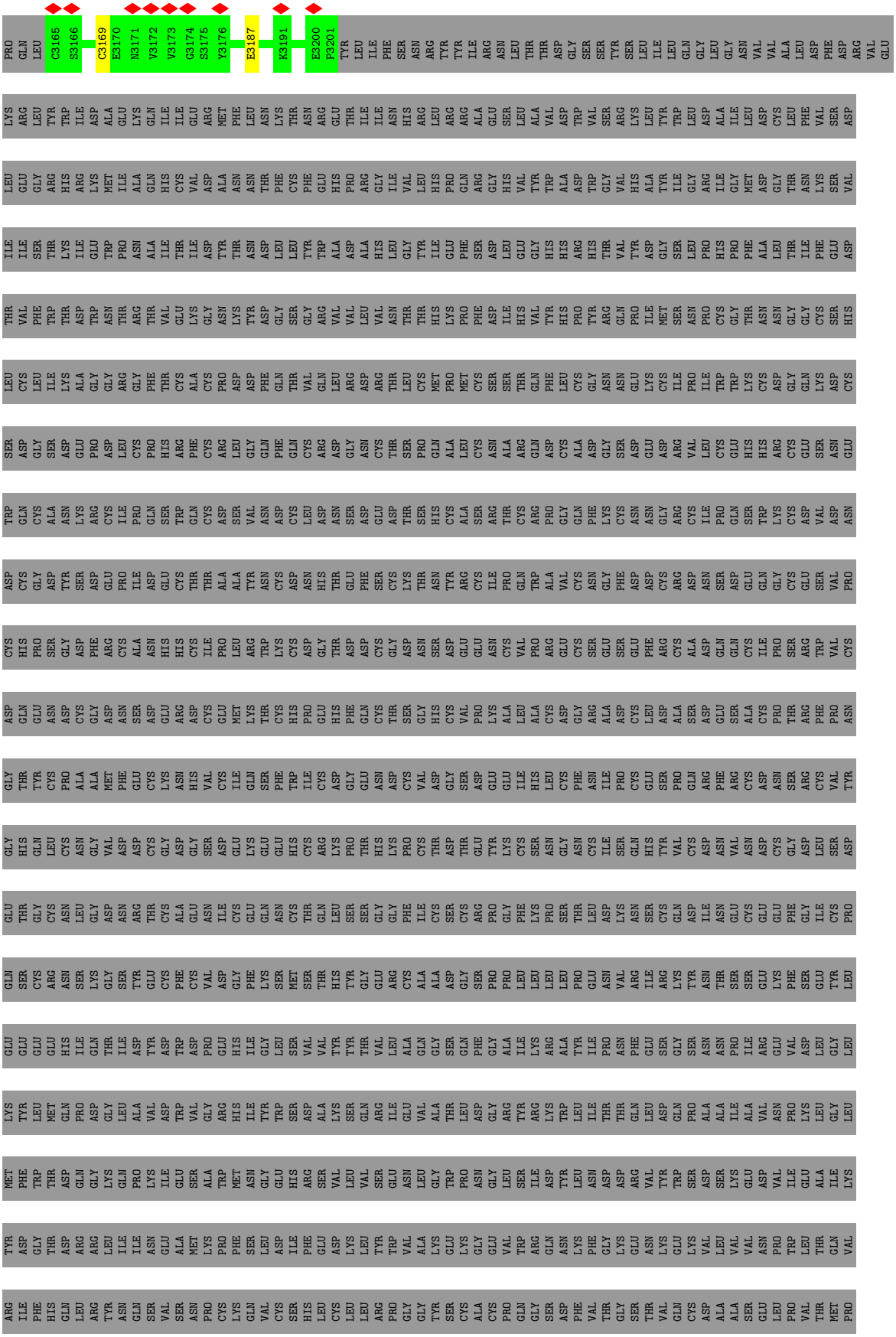
SER HIS THR CYS ARG SER ASN GLU PHE GLN CYS LEU SER PRO GLN ARG CYS ILE PRO SER TYR TRP PHE CYS ASP GLY GLU ALA ASP CYS ALA ASP GLY SER ASP GLU PRO ASP THR CYS GLY HIS SER VAL ASN THR CYS ARG ALA SER GLN PHE GLN CYS ASP ASN GLY ARG CYS ILE

SER GLY ASN TRP VAL CYS ASP GLY ASP ASN ASP CYS GLY ASP MET SER ASP GLU ASP GLN ARG HIS HIS CYS GLU LEU GLN ASN CYS SER SER THR GLN PHE THR CYS VAL ASN SER ARG PRO PRO ASN ARG ARG CYS ILE PRO GLN TYR TRP VAL CYS ASP GLY ASP ALA ASP CYS SER

ASP ALA LEU ASP GLU LEU GLN ASN CYS THR MET ARG THR CYS SER ALA GLY GLU PHE SER CYS ALA ASN GLY ARG CYS VAL ARG GLN SER PHE ARG CYS ASP ARG ARG ASN ASP CYS GLY ASP TYR SER ASP GLU ARG GLY CYS SER TYR PRO PRO CYS HIS ALA ASN GLN PHE THR CYS

GLN ASN GLY ARG CYS ILE PRO ARG PHE PHE VAL CYS ASP GLU ASP ASN ASP CYS GLY ASP GLY SER ASP GLU GLN GLU HIS LEU CYS HIS THR PRO GLU PRO THR CYS PRO LEU HIS GLN PHE ARG CYS ASP ASN GLY HIS CYS ILE GLU MET GLY ARG VAL CYS ASN HIS VAL ASP ASP

CYS SER ASP ASN SER ASP GLU LYS GLY CYS GLY ILE ASN GLU CYS LEU ASP SER SER ILE SER ARG CYS ASP HIS ASN CYS THR ASP THR ILE THR SER PHE TYR CYS SER CYS LEU PRO GLY TYR LYS LEU MET SER ASP LYS ARG SER CYS VAL ASP ILE ASP GLU CYS LYS GLU SER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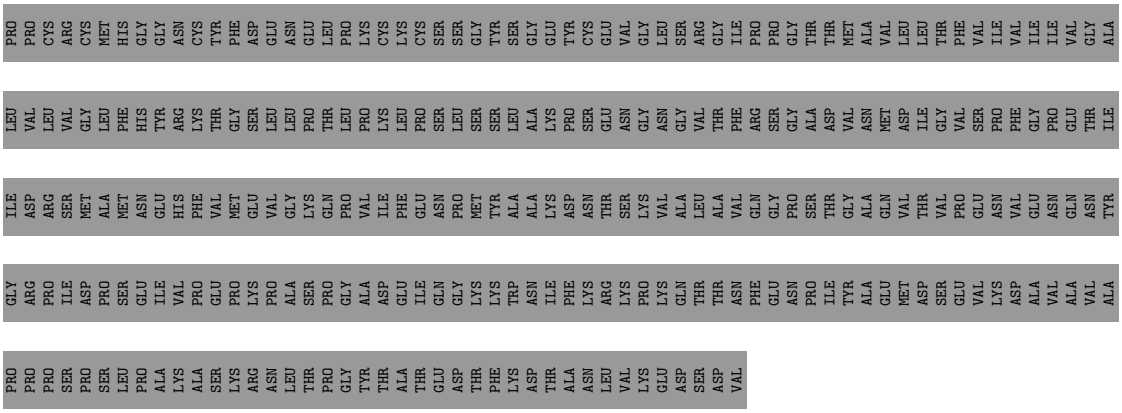


• Molecule 3: unclear peptide

Chain Q: 100%

There are no outlier residues recorded for this chain.

• Molecule 4: unclear peptide

Chain R: 80% 20%

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C: 50% 100%

• Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

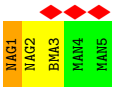
Chain F: 100% 100%

• Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E: 33% 67%

• Molecule 7: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	67775	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.188	Depositor
Minimum map value	-0.100	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.029	Depositor
Map size (Å)	366.86002, 366.86002, 366.86002	wwPDB
Map dimensions	260, 260, 260	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.411, 1.411, 1.411	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: A2G, MAN, CA, NAG, BMA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	D	0.26	0/913	0.46	0/1220
2	A	0.31	0/1176	0.55	0/1603
2	B	0.28	0/9263	0.52	0/12565
4	R	0.19	0/7	0.43	0/8
All	All	0.28	0/11359	0.52	0/15396

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	895	0	885	15	0
2	A	1149	0	967	21	0
2	B	9047	0	8299	129	0
3	Q	30	0	8	0	0
4	R	28	0	12	1	0
5	C	28	0	25	0	0
5	F	28	0	25	4	0
6	E	39	0	34	0	0
7	G	61	0	52	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	A	28	0	26	1	0
8	B	28	0	26	0	0
9	A	14	0	12	0	0
9	B	112	0	96	7	0
10	A	4	0	0	0	0
10	B	12	0	0	0	0
All	All	11503	0	10467	165	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (165) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1149:THR:OG1	9:B:4707:A2G:C1	1.73	1.36
2:B:1109:THR:OG1	9:B:4706:A2G:C1	1.78	1.32
2:B:1109:THR:CB	9:B:4706:A2G:C1	2.49	0.90
2:A:2786:GLU:HG2	2:A:2788:THR:H	1.36	0.87
2:A:2805:ASN:HD22	2:A:2812:THR:HG23	1.51	0.74
2:B:353:ILE:HG12	2:B:356:ILE:HB	1.70	0.74
2:A:2827:PHE:HB3	2:A:2836:CYS:HB2	1.69	0.73
2:B:715:LYS:HB2	2:B:955:SER:HB2	1.77	0.67
1:D:282:GLU:HA	1:D:285:LYS:HZ3	1.60	0.67
2:B:1149:THR:CB	9:B:4707:A2G:C1	2.71	0.67
2:B:1105:ALA:HB3	9:B:4710:A2G:H3	1.75	0.67
2:B:190:CYS:SG	2:B:191:GLY:N	2.70	0.65
2:B:1109:THR:HB	9:B:4706:A2G:C1	2.27	0.65
2:B:343:ARG:HD3	2:B:344:THR:HG23	1.79	0.64
1:D:283:GLU:HG2	1:D:348:LEU:HD21	1.81	0.62
2:B:451:ASP:OD2	2:B:453:ASN:ND2	2.32	0.62
2:B:1045:ASP:HA	2:B:1070:ALA:HB2	1.81	0.62
2:A:2760:ARG:NH2	2:A:2774:ALA:O	2.32	0.62
2:B:766:LYS:HD3	2:B:777:ILE:HD11	1.81	0.61
2:B:811:ARG:NH1	2:B:814:ASP:OD1	2.33	0.61
2:B:807:VAL:HG13	2:B:821:ILE:HB	1.83	0.61
2:B:825:ASN:O	2:B:826:ASN:ND2	2.34	0.60
2:B:616:THR:HG22	2:B:623:VAL:HG22	1.83	0.60
2:B:534:GLN:N	2:B:534:GLN:OE1	2.33	0.59
2:B:574:ASP:OD1	2:B:577:TYR:N	2.28	0.59
2:B:713:SER:HB3	2:B:745:ILE:HD13	1.85	0.59
2:B:863:ILE:HG22	2:B:864:VAL:HG23	1.83	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:262:ASP:OD1	1:D:263:LEU:N	2.36	0.58
2:B:503:LEU:HD13	2:B:543:ASP:HA	1.86	0.58
2:A:2737:CYS:HA	2:A:2740:HIS:HB3	1.84	0.58
2:B:381:GLY:O	2:B:382:GLN:HG3	2.03	0.58
2:B:486:LYS:HG2	2:B:736:THR:HG21	1.85	0.57
2:B:431:HIS:HD2	2:B:434:LYS:H	1.50	0.57
2:B:886:VAL:HG12	2:B:893:ILE:HG12	1.86	0.56
1:D:283:GLU:OE1	1:D:344:HIS:NE2	2.34	0.56
2:B:738:SER:HB3	2:B:739:PRO:HD3	1.87	0.56
2:B:1088:ARG:HH11	2:B:1088:ARG:HB3	1.71	0.56
2:B:616:THR:HB	2:B:644:PRO:HB2	1.88	0.55
2:A:2810:ASN:HB2	8:A:4702:NAG:O5	2.07	0.55
2:B:272:CYS:HB2	2:B:295:ASP:HB3	1.88	0.55
2:B:738:SER:HB3	2:B:739:PRO:CD	2.37	0.55
2:B:349:ASP:OD1	2:B:364:ARG:NH1	2.40	0.54
2:B:299:ASN:OD1	2:B:301:THR:OG1	2.25	0.54
2:B:725:LEU:HD11	2:B:949:ILE:HD12	1.91	0.53
2:B:1064:ASN:HB2	5:F:1:NAG:H2	1.89	0.53
2:B:543:ASP:OD1	2:B:545:SER:OG	2.26	0.53
2:B:318:TYR:CG	2:B:332:PRO:HD3	2.44	0.53
2:B:963:ASP:HB3	2:B:966:LEU:HD23	1.90	0.53
2:B:526:SER:HB2	2:B:558:PRO:HB2	1.91	0.53
2:B:1003:MET:HG2	2:B:1012:CYS:HB3	1.90	0.52
1:D:324:LYS:O	1:D:328:VAL:HG22	2.10	0.52
2:B:735:VAL:HG11	2:B:756:TYR:CZ	2.45	0.52
5:F:1:NAG:O4	5:F:2:NAG:N2	2.41	0.51
2:B:928:THR:HG21	2:B:957:MET:O	2.10	0.51
2:B:214:GLU:OE1	2:B:219:TYR:OH	2.29	0.51
2:B:1040:SER:O	2:B:1042:PHE:N	2.44	0.50
2:B:1157:CYS:HB3	2:B:1160:HIS:HB3	1.93	0.50
2:A:2779:ARG:NH1	2:A:2794:CYS:SG	2.69	0.50
2:B:426:MET:HB3	2:B:442:PRO:HD3	1.93	0.50
2:B:257:GLU:OE2	2:B:260:GLN:HB3	2.11	0.50
2:B:1188:CYS:HB2	2:B:1194:LYS:HE2	1.93	0.50
2:B:872:ASN:OD1	4:R:2:ASN:ND2	2.40	0.49
2:A:2747:PHE:HB3	2:A:2755:VAL:HG13	1.95	0.49
1:D:304:SER:HA	1:D:307:LYS:HB2	1.95	0.48
2:B:431:HIS:CD2	2:B:434:LYS:H	2.32	0.48
2:B:475:TRP:CZ2	2:B:656:PRO:HD2	2.48	0.48
1:D:311:VAL:HA	1:D:314:ILE:HD12	1.96	0.48
2:B:433:GLN:HE22	7:G:1:NAG:H5	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:206:ASN:OD1	2:B:211:ASN:ND2	2.27	0.48
2:B:779:ALA:HB1	2:B:1036:LYS:HG2	1.94	0.48
2:B:793:ILE:HG21	2:B:971:ASN:OD1	2.14	0.47
2:B:1024:GLN:O	2:B:1025:CYS:HB3	2.15	0.47
2:B:1140:ASP:OD1	2:B:1140:ASP:N	2.41	0.47
2:B:341:ASP:HB2	2:B:343:ARG:HG3	1.97	0.47
2:B:538:GLU:HA	2:B:550:LEU:H	1.80	0.47
2:B:852:ARG:NH1	2:B:898:LEU:O	2.44	0.47
2:B:1124:PRO:HD2	2:B:1127:TRP:CE3	2.50	0.47
2:B:331:CYS:HB2	2:B:332:PRO:HD2	1.97	0.47
2:B:846:ARG:HB3	2:B:847:PRO:HD3	1.97	0.47
2:B:474:ASP:HB3	2:B:479:LYS:HB2	1.97	0.47
2:B:407:ASP:N	2:B:407:ASP:OD1	2.36	0.47
2:B:1236:PHE:N	2:B:1245:ILE:O	2.39	0.47
2:B:266:TYR:HB3	2:B:267:PRO:HD2	1.96	0.46
2:A:2830:CYS:HB2	2:A:2835:ILE:HD11	1.97	0.46
2:B:1134:ASP:N	2:B:1134:ASP:OD1	2.49	0.46
2:A:2785:THR:HA	2:A:2796:PRO:HA	1.97	0.46
2:B:1275:THR:HA	2:B:1287:LYS:HE3	1.97	0.46
2:B:396:ILE:HG22	2:B:405:VAL:HG22	1.97	0.46
2:B:609:PHE:HB2	2:B:649:VAL:HG11	1.97	0.46
2:B:1091:ASP:OD1	2:B:1091:ASP:N	2.48	0.45
2:B:562:THR:HG23	2:B:608:LEU:HD23	1.98	0.45
2:B:263:HIS:HB3	2:B:265:CYS:SG	2.57	0.45
2:B:781:ARG:NH2	2:B:1023:GLN:O	2.50	0.45
1:D:293:LYS:NZ	2:B:203:ASP:OD2	2.45	0.45
2:B:426:MET:HB3	2:B:442:PRO:CD	2.47	0.45
2:B:1226:ARG:HG3	2:B:1232:HIS:CE1	2.52	0.45
1:D:273:THR:HG22	1:D:275:LYS:H	1.82	0.45
2:A:2787:PHE:CZ	2:A:2814:ASP:HA	2.51	0.45
2:B:237:GLN:HE21	2:B:539:ARG:HH21	1.65	0.45
2:B:266:TYR:CE2	2:B:353:ILE:HA	2.52	0.45
2:B:844:TRP:HB2	2:B:870:TRP:HA	1.99	0.45
2:B:866:THR:OG1	2:B:1257:CYS:O	2.35	0.45
2:B:1081:PRO:HD2	2:B:1084:TRP:CE3	2.52	0.45
2:B:573:VAL:HB	2:B:603:PRO:HB2	2.00	0.44
2:B:367:ARG:NE	2:B:367:ARG:HA	2.32	0.44
2:B:990:VAL:HG21	2:B:996:VAL:HG13	1.98	0.44
1:D:296:HIS:O	1:D:300:GLN:HG3	2.17	0.44
2:A:2772:ASP:OD1	2:A:2772:ASP:N	2.50	0.44
2:B:699:ASP:OD2	2:B:702:ARG:NH1	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1064:ASN:HB2	5:F:1:NAG:C2	2.47	0.44
2:B:1207:ARG:NH1	2:B:1219:ASP:O	2.37	0.44
2:B:781:ARG:HB2	2:B:817:ARG:NH2	2.33	0.44
2:B:681:ASN:ND2	2:B:686:TYR:O	2.49	0.44
2:B:1088:ARG:HB3	2:B:1088:ARG:NH1	2.31	0.44
2:B:308:MET:HG3	2:B:322:GLN:HB3	2.00	0.43
2:A:2827:PHE:CE2	2:A:2838:PRO:HG3	2.53	0.43
2:A:2829:LYS:HA	2:A:2835:ILE:O	2.18	0.43
2:B:451:ASP:HB3	2:B:454:GLY:O	2.19	0.43
2:A:2828:THR:O	2:A:2836:CYS:HA	2.18	0.43
2:B:244:ASP:N	2:B:253:GLU:OE1	2.51	0.43
1:D:333:LYS:NZ	2:B:206:ASN:O	2.46	0.43
2:B:270:TRP:CH2	2:B:272:CYS:HA	2.54	0.42
2:B:1172:ASP:OD1	2:B:1172:ASP:N	2.51	0.42
2:B:1194:LYS:H	2:B:1194:LYS:HG2	1.63	0.42
2:B:421:ASN:ND2	2:B:444:GLN:OE1	2.52	0.42
5:F:1:NAG:H82	5:F:2:NAG:H61	2.01	0.42
2:B:1234:ASP:O	2:B:1247:ASN:HB2	2.20	0.42
2:A:2767:CYS:HB2	2:A:2772:ASP:OD1	2.19	0.42
2:B:818:ARG:NH2	2:B:1000:PRO:O	2.52	0.42
2:B:931:ARG:NH2	2:B:1213:ASP:OD1	2.53	0.42
2:B:510:HIS:HB3	2:B:528:TRP:NE1	2.35	0.42
2:B:1281:ASN:HD21	2:B:1283:ASN:HD21	1.67	0.42
2:B:367:ARG:HH11	2:B:367:ARG:HG2	1.85	0.42
2:B:780:ASN:CG	2:B:781:ARG:HG3	2.41	0.42
2:A:2827:PHE:HE2	2:A:2838:PRO:HG3	1.85	0.41
2:B:405:VAL:HG23	2:B:416:LEU:HB2	2.01	0.41
2:B:1040:SER:C	2:B:1042:PHE:N	2.73	0.41
2:B:318:TYR:CD2	2:B:319:GLN:HB2	2.55	0.41
1:D:268:GLN:HE21	1:D:268:GLN:HB3	1.59	0.41
2:A:2779:ARG:CZ	2:A:2779:ARG:HB3	2.50	0.41
2:A:2837:VAL:HG21	2:A:2849:CYS:HA	2.01	0.41
2:B:424:MET:O	2:B:441:ASP:HA	2.20	0.41
2:B:826:ASN:HB3	2:B:844:TRP:NE1	2.35	0.41
2:B:738:SER:CB	2:B:739:PRO:CD	2.98	0.41
2:B:1109:THR:HB	9:B:4706:A2G:C5	2.51	0.41
1:D:336:GLU:HG3	1:D:340:LYS:NZ	2.36	0.41
2:B:739:PRO:HG2	2:B:761:LYS:NZ	2.36	0.41
2:B:1046:GLY:HA3	2:B:1081:PRO:HD3	2.01	0.41
2:B:846:ARG:O	2:B:846:ARG:NE	2.54	0.41
2:B:357:CYS:HB3	2:B:370:CYS:HB3	1.97	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:413:PHE:CZ	2:B:638:HIS:HB2	2.56	0.41
2:B:1281:ASN:HD21	2:B:1283:ASN:ND2	2.18	0.41
2:A:2779:ARG:NH1	2:A:2779:ARG:HB3	2.36	0.41
2:B:442:PRO:HA	2:B:468:PRO:HD2	2.02	0.41
2:B:476:ILE:HG22	2:B:660:ASN:HB3	2.02	0.41
2:B:197:LEU:HD12	2:B:200:TYR:CE2	2.56	0.41
2:B:473:VAL:HG12	2:B:480:LEU:HD13	2.02	0.41
2:B:890:PHE:HB2	2:B:892:LYS:HE2	2.03	0.41
2:B:372:CYS:HB3	2:B:376:TYR:HB3	2.02	0.40
2:B:790:PHE:CE2	2:B:792:TRP:HA	2.56	0.40
2:A:2825:PRO:C	2:A:2827:PHE:H	2.24	0.40
2:B:444:GLN:O	2:B:445:GLU:HB2	2.21	0.40
1:D:301:LEU:O	1:D:305:HIS:HB2	2.21	0.40
2:B:1227:PRO:HB2	2:B:1230:MET:HB2	2.03	0.40
1:D:271:ASN:ND2	1:D:355:ALA:O	2.32	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	103/332 (31%)	101 (98%)	2 (2%)	0	100	100
2	A	149/4660 (3%)	135 (91%)	14 (9%)	0	100	100
2	B	1162/4660 (25%)	1084 (93%)	77 (7%)	1 (0%)	48	79
4	R	1/5 (20%)	1 (100%)	0	0	100	100
All	All	1415/9657 (15%)	1321 (93%)	93 (7%)	1 (0%)	50	79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	1041	PHE

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	D	99/299 (33%)	95 (96%)	4 (4%)	27 56
2	A	135/4089 (3%)	125 (93%)	10 (7%)	11 36
2	B	1025/4089 (25%)	977 (95%)	48 (5%)	22 51
4	R	1/1 (100%)	1 (100%)	0	100 100
All	All	1260/8478 (15%)	1198 (95%)	62 (5%)	23 50

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	337	LEU
1	D	340	LYS
1	D	344	HIS
1	D	346	GLN
2	A	2741	THR
2	A	2753	ARG
2	A	2779	ARG
2	A	2781	CYS
2	A	2812	THR
2	A	2813	SER
2	A	2823	CYS
2	A	2836	CYS
2	A	2837	VAL
2	A	2854	ASP
2	B	187	GLU
2	B	217	CYS
2	B	221	THR
2	B	229	CYS
2	B	257	GLU
2	B	272	CYS
2	B	278	CYS

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Mol	Chain	Res	Type
2	B	343	ARG
2	B	350	ASP
2	B	353	ILE
2	B	368	HIS
2	B	407	ASP
2	B	421	ASN
2	B	466	ASP
2	B	489	ARG
2	B	516	LEU
2	B	563	LEU
2	B	595	ARG
2	B	617	ASP
2	B	643	ARG
2	B	690	CYS
2	B	715	LYS
2	B	741	PHE
2	B	746	ASP
2	B	835	THR
2	B	839	MET
2	B	846	ARG
2	B	849	LYS
2	B	861	MET
2	B	891	ASP
2	B	895	HIS
2	B	899	ASP
2	B	928	THR
2	B	946	MET
2	B	966	LEU
2	B	995	ARG
2	B	1003	MET
2	B	1010	MET
2	B	1088	ARG
2	B	1091	ASP
2	B	1126	ASP
2	B	1134	ASP
2	B	1172	ASP
2	B	1201	CYS
2	B	1300	MET
2	B	1312	HIS
2	B	3169	CYS
2	B	3187	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15)

such sidechains are listed below:

Mol	Chain	Res	Type
1	D	268	GLN
1	D	294	HIS
2	A	2740	HIS
2	A	2808	HIS
2	B	315	ASN
2	B	363	ASN
2	B	412	ASN
2	B	421	ASN
2	B	431	HIS
2	B	433	GLN
2	B	444	GLN
2	B	507	ASN
2	B	826	ASN
2	B	1192	GLN
2	B	1283	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

12 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	C	1	5,2	14,14,15	0.35	0	17,19,21	1.17	2 (11%)
5	NAG	C	2	5	14,14,15	0.33	0	17,19,21	0.78	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	NAG	E	1	6,2	14,14,15	0.28	0	17,19,21	0.80	0
6	NAG	E	2	6	14,14,15	0.46	0	17,19,21	1.26	4 (23%)
6	BMA	E	3	6	11,11,12	0.29	0	15,15,17	1.09	2 (13%)
5	NAG	F	1	5,2	14,14,15	0.79	1 (7%)	17,19,21	1.93	3 (17%)
5	NAG	F	2	5	14,14,15	0.32	0	17,19,21	0.67	1 (5%)
7	NAG	G	1	7,2	14,14,15	0.49	0	17,19,21	1.63	2 (11%)
7	NAG	G	2	7	14,14,15	0.49	0	17,19,21	1.30	3 (17%)
7	BMA	G	3	7	11,11,12	0.45	0	15,15,17	1.08	1 (6%)
7	MAN	G	4	7	11,11,12	0.34	0	15,15,17	0.92	0
7	MAN	G	5	7	11,11,12	0.22	0	15,15,17	0.60	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	C	1	5,2	-	1/6/23/26	0/1/1/1
5	NAG	C	2	5	-	2/6/23/26	0/1/1/1
6	NAG	E	1	6,2	-	0/6/23/26	0/1/1/1
6	NAG	E	2	6	-	0/6/23/26	0/1/1/1
6	BMA	E	3	6	-	0/2/19/22	0/1/1/1
5	NAG	F	1	5,2	-	1/6/23/26	0/1/1/1
5	NAG	F	2	5	-	5/6/23/26	0/1/1/1
7	NAG	G	1	7,2	-	1/6/23/26	0/1/1/1
7	NAG	G	2	7	-	2/6/23/26	0/1/1/1
7	BMA	G	3	7	-	2/2/19/22	0/1/1/1
7	MAN	G	4	7	-	0/2/19/22	0/1/1/1
7	MAN	G	5	7	-	0/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	1	NAG	C1-C2	2.52	1.56	1.52

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	F	1	NAG	C1-O5-C5	5.96	120.27	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	G	1	NAG	C4-C3-C2	-3.92	105.27	111.02
7	G	2	NAG	C1-O5-C5	2.97	116.21	112.19
7	G	3	BMA	C1-C2-C3	2.92	113.25	109.67
5	F	1	NAG	C3-C4-C5	-2.90	105.07	110.24
6	E	2	NAG	C1-O5-C5	2.72	115.87	112.19
7	G	1	NAG	C2-N2-C7	-2.53	119.29	122.90
7	G	2	NAG	O5-C1-C2	-2.42	107.47	111.29
6	E	3	BMA	C1-C2-C3	2.41	112.63	109.67
5	C	2	NAG	C1-O5-C5	2.41	115.46	112.19
6	E	3	BMA	C1-O5-C5	2.39	115.43	112.19
6	E	2	NAG	C2-N2-C7	-2.35	119.56	122.90
7	G	2	NAG	C2-N2-C7	-2.29	119.64	122.90
6	E	2	NAG	O5-C1-C2	-2.28	107.68	111.29
5	C	1	NAG	C1-O5-C5	2.24	115.22	112.19
5	F	2	NAG	O5-C5-C6	2.23	110.70	107.20
5	C	1	NAG	C4-C3-C2	-2.21	107.78	111.02
5	F	1	NAG	O5-C1-C2	2.07	114.55	111.29
6	E	2	NAG	C1-C2-N2	2.02	113.94	110.49

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	F	2	NAG	C3-C2-N2-C7
5	F	2	NAG	C8-C7-N2-C2
5	F	2	NAG	O7-C7-N2-C2
5	C	2	NAG	C8-C7-N2-C2
5	C	2	NAG	O7-C7-N2-C2
7	G	3	BMA	O5-C5-C6-O6
7	G	2	NAG	C4-C5-C6-O6
7	G	2	NAG	O5-C5-C6-O6
5	F	2	NAG	C4-C5-C6-O6
5	F	1	NAG	C3-C2-N2-C7
7	G	1	NAG	C8-C7-N2-C2
5	C	1	NAG	C4-C5-C6-O6
7	G	3	BMA	C4-C5-C6-O6
5	F	2	NAG	O5-C5-C6-O6

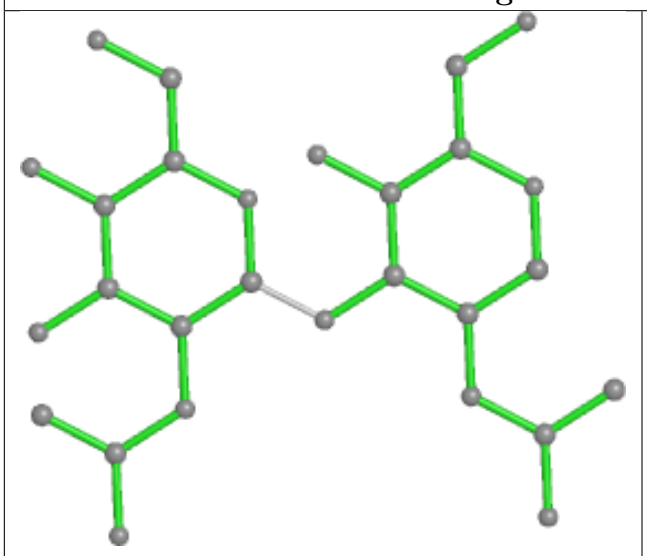
There are no ring outliers.

3 monomers are involved in 5 short contacts:

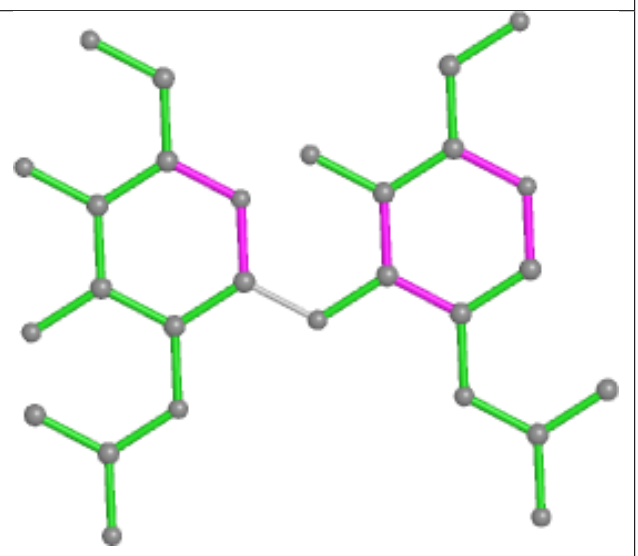
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	F	2	NAG	2	0
7	G	1	NAG	1	0
5	F	1	NAG	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

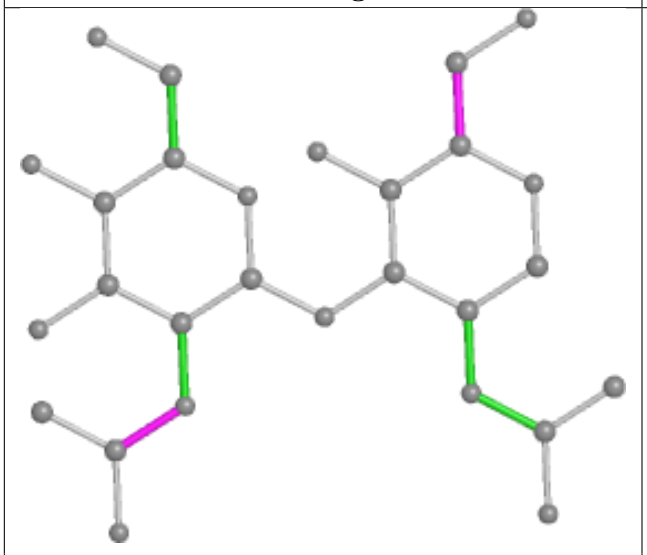
Oligosaccharide Chain C



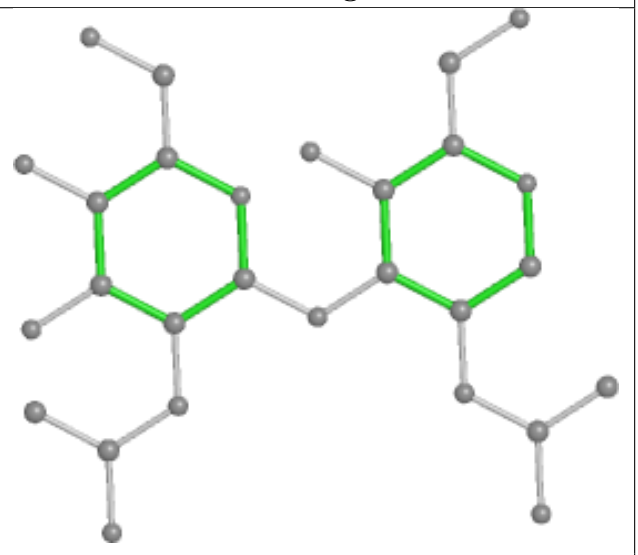
Bond lengths



Bond angles

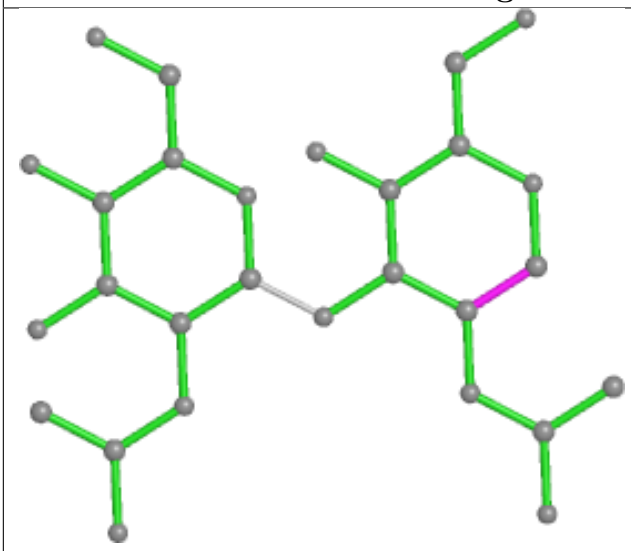


Torsions

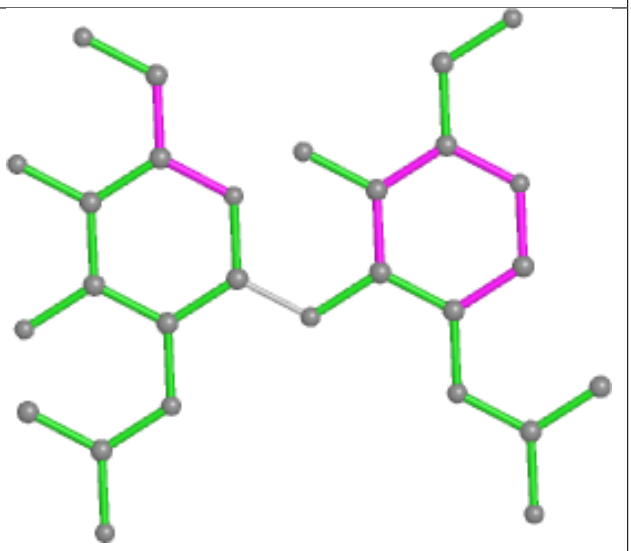


Rings

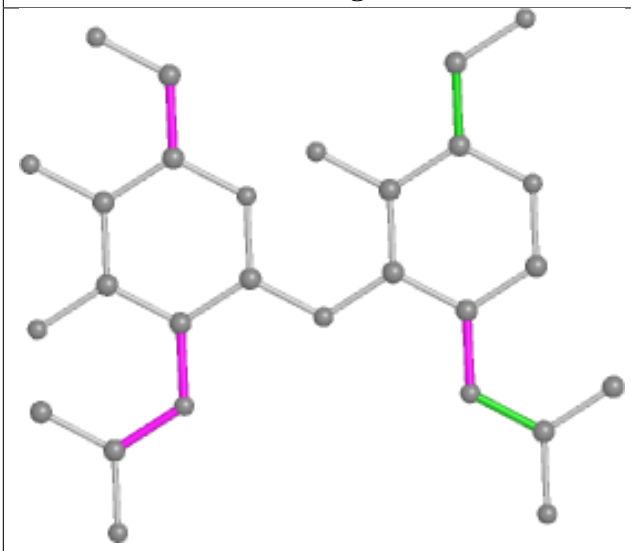
Oligosaccharide Chain F



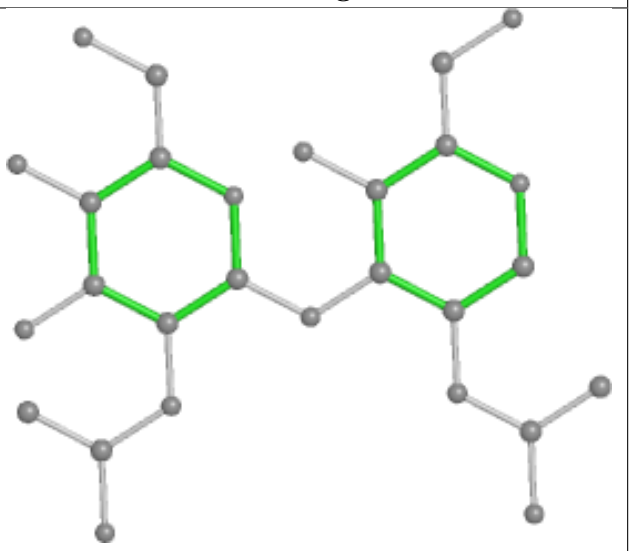
Bond lengths



Bond angles

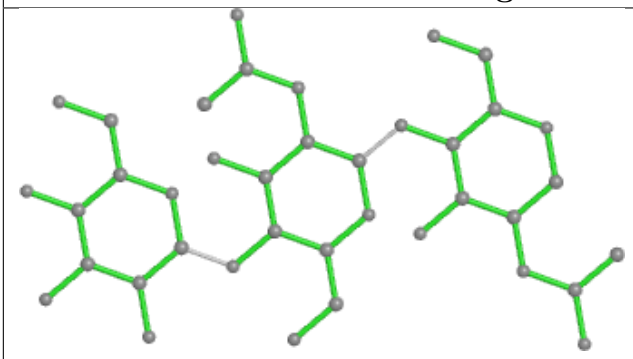


Torsions

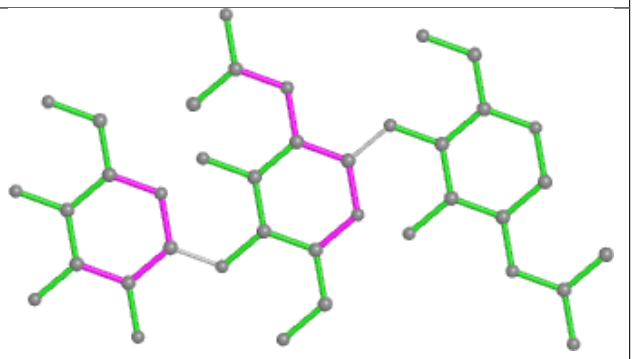


Rings

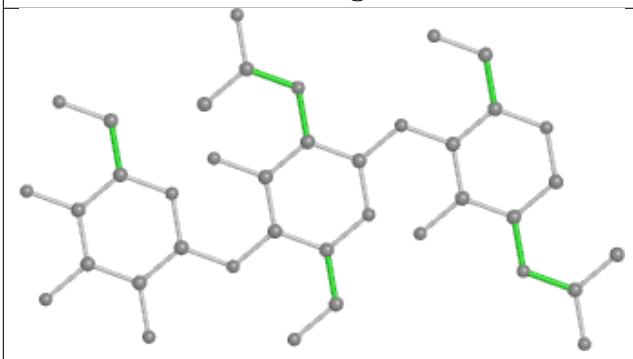
Oligosaccharide Chain E



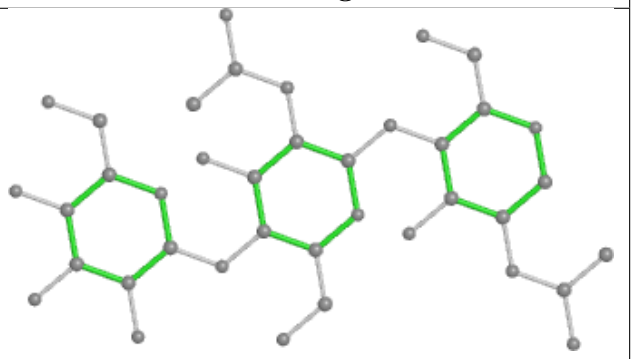
Bond lengths



Bond angles

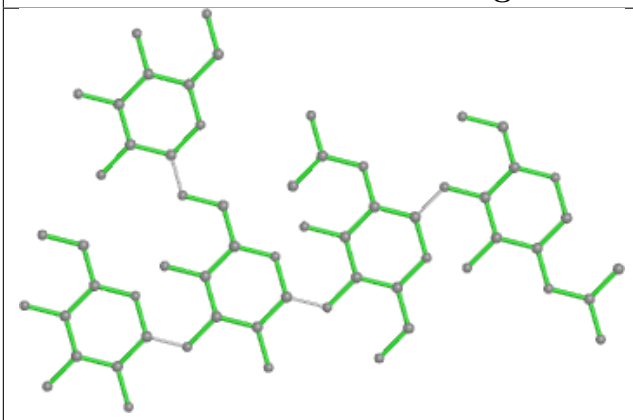


Torsions

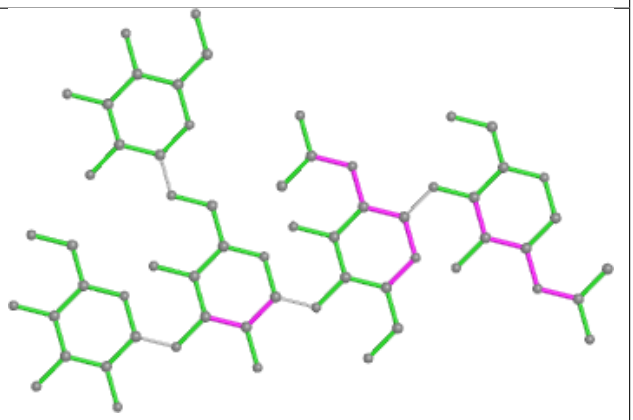


Rings

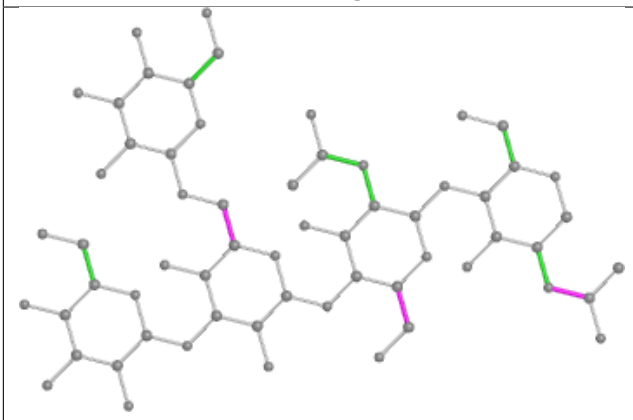
Oligosaccharide Chain G



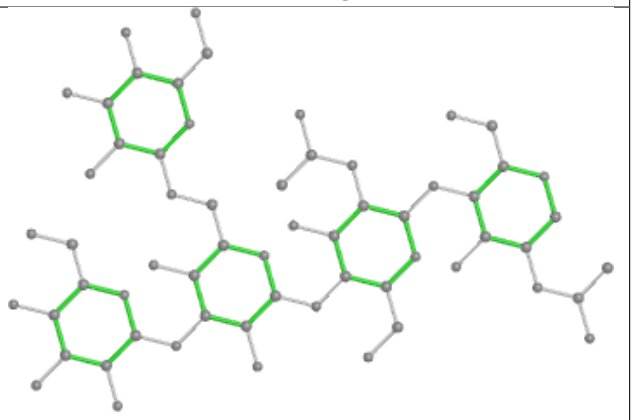
Bond lengths



Bond angles



Torsions



Rings

5.6 Ligand geometry (i)

Of 29 ligands modelled in this entry, 16 are monoatomic - leaving 13 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
9	A2G	B	4705	2	14,14,15	0.40	0	17,19,21	0.53	0
9	A2G	B	4710	2	14,14,15	0.40	0	17,19,21	0.79	1 (5%)
9	A2G	B	4704	2	14,14,15	0.44	0	17,19,21	0.87	1 (5%)
9	A2G	B	4707	-	14,14,15	0.40	0	17,19,21	1.68	3 (17%)
9	A2G	B	4706	-	14,14,15	0.39	0	17,19,21	2.02	3 (17%)
9	A2G	B	4708	2	14,14,15	0.40	0	17,19,21	1.11	1 (5%)
8	NAG	A	4702	2	14,14,15	0.40	0	17,19,21	1.05	2 (11%)
9	A2G	A	4703	2	14,14,15	0.42	0	17,19,21	0.69	1 (5%)
8	NAG	B	4702	2	14,14,15	0.38	0	17,19,21	1.18	2 (11%)
9	A2G	B	4703	2	14,14,15	0.41	0	17,19,21	0.73	0
9	A2G	B	4709	2	14,14,15	0.40	0	17,19,21	0.42	0
8	NAG	B	4701	2	14,14,15	0.30	0	17,19,21	0.64	0
8	NAG	A	4701	2	14,14,15	0.37	0	17,19,21	1.28	3 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	A2G	B	4705	2	-	0/6/23/26	0/1/1/1
9	A2G	B	4710	2	-	1/6/23/26	0/1/1/1
9	A2G	B	4704	2	-	0/6/23/26	0/1/1/1
9	A2G	B	4707	-	-	1/6/23/26	0/1/1/1
9	A2G	B	4706	-	-	0/6/23/26	0/1/1/1
9	A2G	B	4708	2	-	2/6/23/26	0/1/1/1
8	NAG	A	4702	2	-	0/6/23/26	0/1/1/1
9	A2G	A	4703	2	-	2/6/23/26	0/1/1/1
8	NAG	B	4702	2	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	A2G	B	4703	2	-	3/6/23/26	0/1/1/1
9	A2G	B	4709	2	-	1/6/23/26	0/1/1/1
8	NAG	B	4701	2	-	3/6/23/26	0/1/1/1
8	NAG	A	4701	2	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	B	4706	A2G	O5-C1-C2	7.42	123.01	111.29
9	B	4707	A2G	O5-C1-C2	6.06	120.86	111.29
9	B	4708	A2G	O5-C1-C2	3.98	117.58	111.29
9	B	4704	A2G	O5-C1-C2	-3.24	106.18	111.29
8	B	4702	NAG	C1-O5-C5	-3.16	107.91	112.19
8	B	4702	NAG	O5-C5-C6	3.07	112.02	107.20
9	B	4706	A2G	C1-O5-C5	2.99	116.24	112.19
8	A	4702	NAG	O5-C1-C2	-2.65	107.10	111.29
9	B	4707	A2G	C1-C2-N2	2.31	114.43	110.49
8	A	4702	NAG	O5-C5-C6	2.28	110.79	107.20
8	A	4701	NAG	C2-N2-C7	2.21	126.05	122.90
8	A	4701	NAG	O5-C1-C2	-2.18	107.84	111.29
9	B	4707	A2G	C1-O5-C5	2.16	115.11	112.19
9	B	4710	A2G	O5-C1-C2	2.08	114.57	111.29
9	A	4703	A2G	O5-C1-C2	-2.06	108.04	111.29
9	B	4706	A2G	C1-C2-N2	2.02	113.94	110.49
8	A	4701	NAG	C1-C2-N2	2.02	113.93	110.49

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	B	4702	NAG	C8-C7-N2-C2
8	B	4702	NAG	O7-C7-N2-C2
8	B	4701	NAG	C8-C7-N2-C2
9	B	4703	A2G	C1-C2-N2-C7
8	B	4701	NAG	O7-C7-N2-C2
8	B	4702	NAG	C1-C2-N2-C7
8	B	4701	NAG	C1-C2-N2-C7
9	B	4708	A2G	C1-C2-N2-C7
8	B	4702	NAG	O5-C5-C6-O6
9	B	4710	A2G	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
9	B	4709	A2G	O5-C5-C6-O6
9	B	4707	A2G	O5-C5-C6-O6
9	B	4703	A2G	O5-C5-C6-O6
8	A	4701	NAG	C3-C2-N2-C7
9	A	4703	A2G	C3-C2-N2-C7
9	B	4703	A2G	C3-C2-N2-C7
9	B	4708	A2G	C3-C2-N2-C7
9	A	4703	A2G	C1-C2-N2-C7

There are no ring outliers.

4 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	B	4710	A2G	1	0
9	B	4707	A2G	2	0
9	B	4706	A2G	4	0
8	A	4702	NAG	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

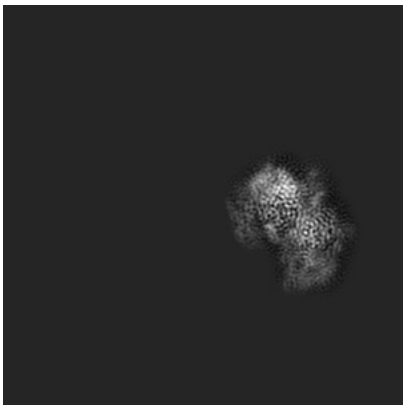
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-36701. These allow visual inspection of the internal detail of the map and identification of artifacts.

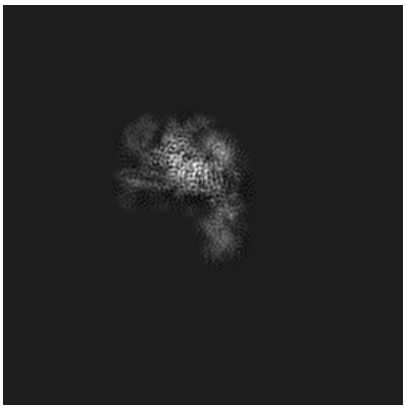
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

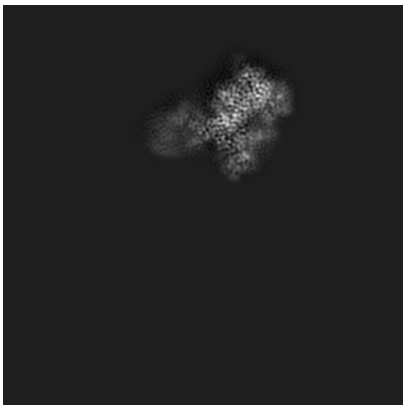
6.1.1 Primary map



X

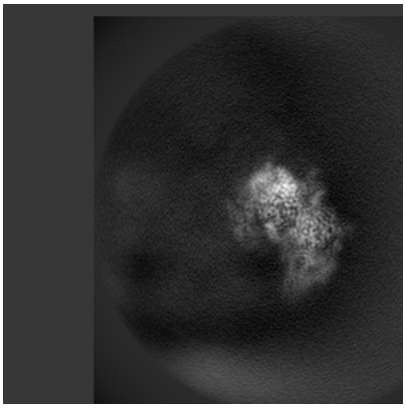


Y

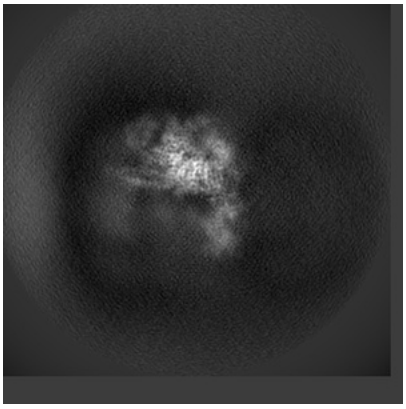


Z

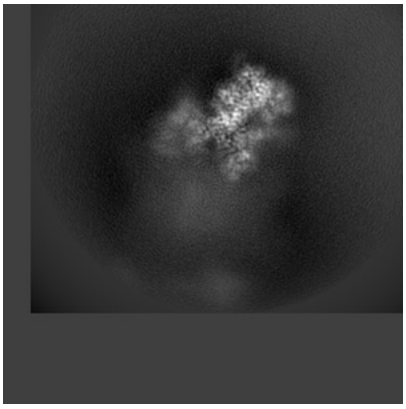
6.1.2 Raw map



X



Y

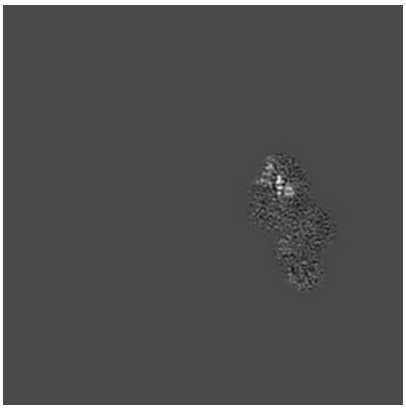


Z

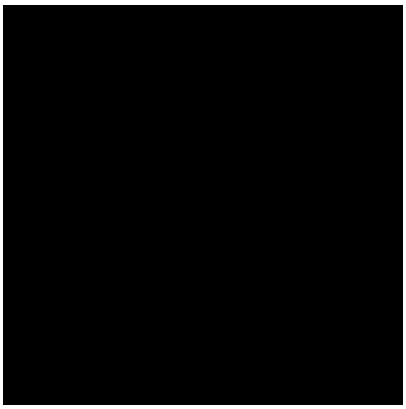
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map



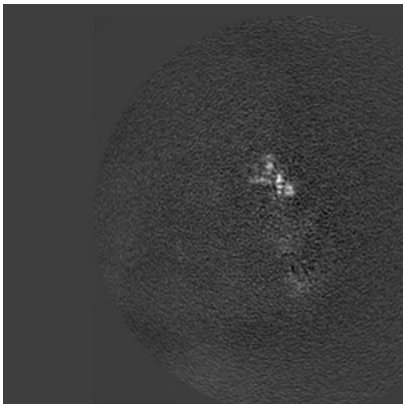
X Index: 130



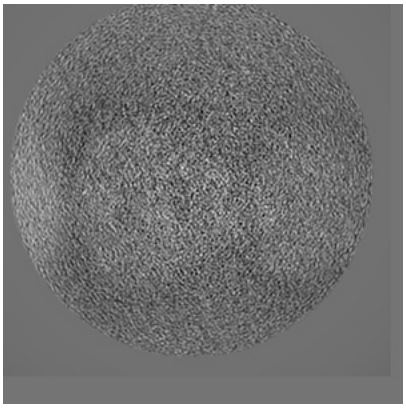
Y Index: 130

Z Index: 130

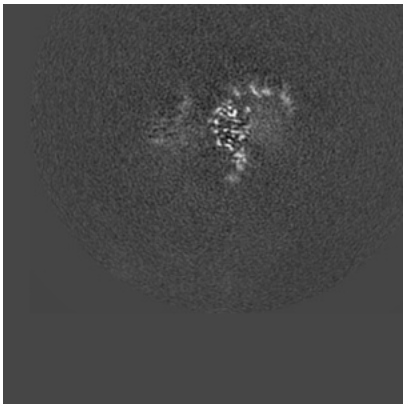
6.2.2 Raw map



X Index: 130



Y Index: 130

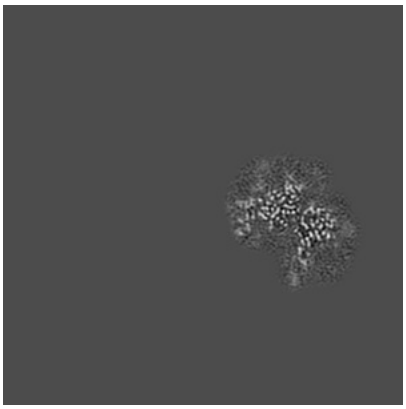


Z Index: 130

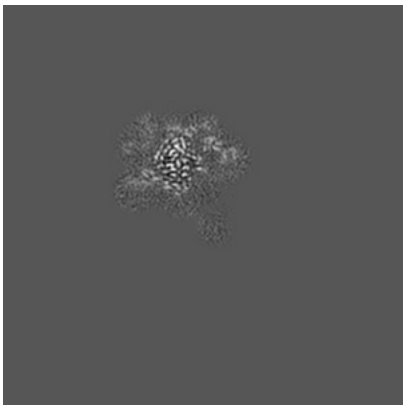
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



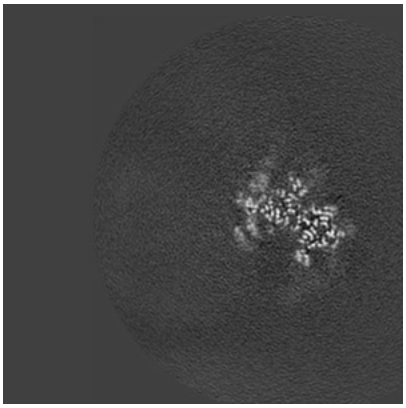
X Index: 153



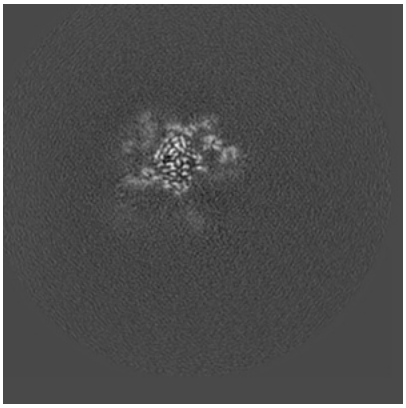
Y Index: 200

Z Index: 124

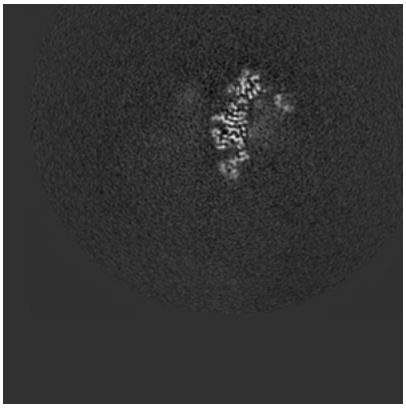
6.3.2 Raw map



X Index: 156



Y Index: 200

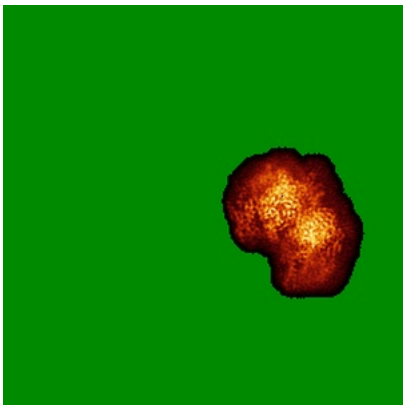


Z Index: 124

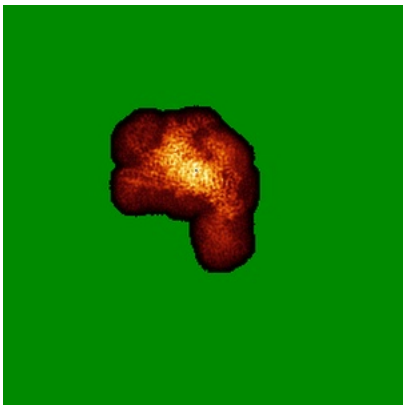
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

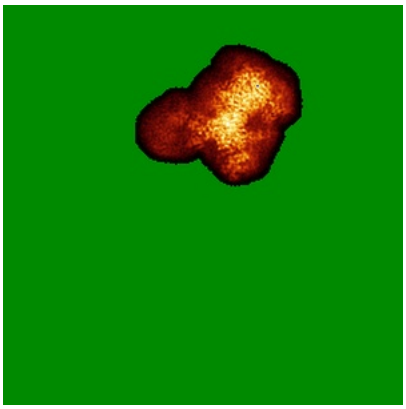
6.4.1 Primary map



X

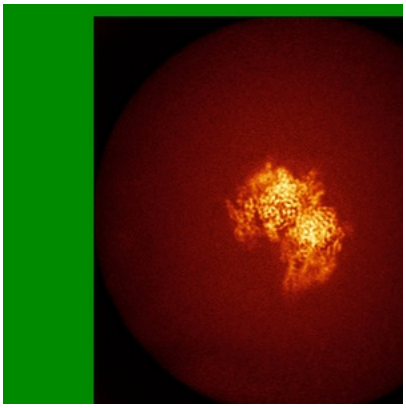


Y

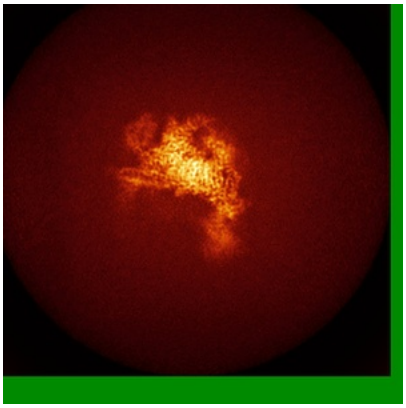


Z

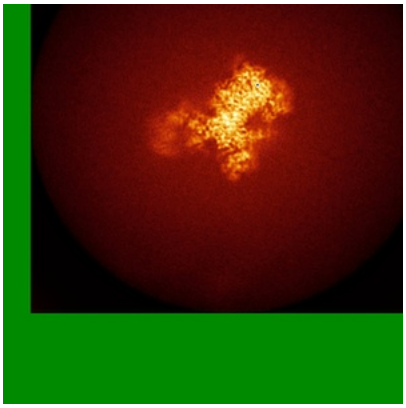
6.4.2 Raw map



X



Y

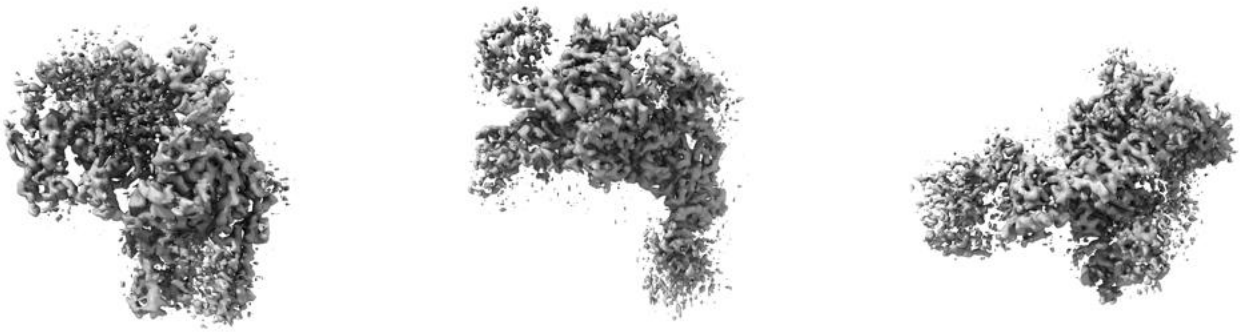


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.029. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

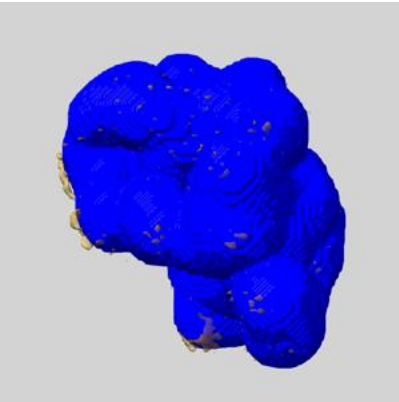
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

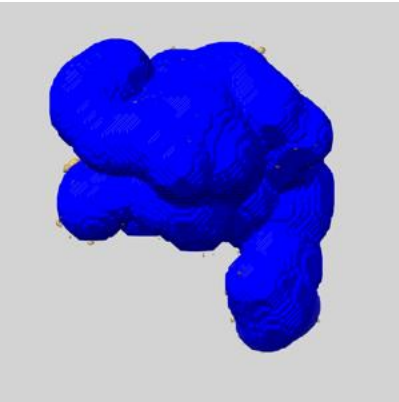
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

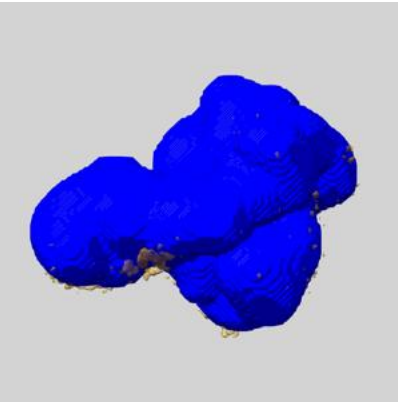
6.6.1 emd_36701_msk_1.map (i)



X



Y

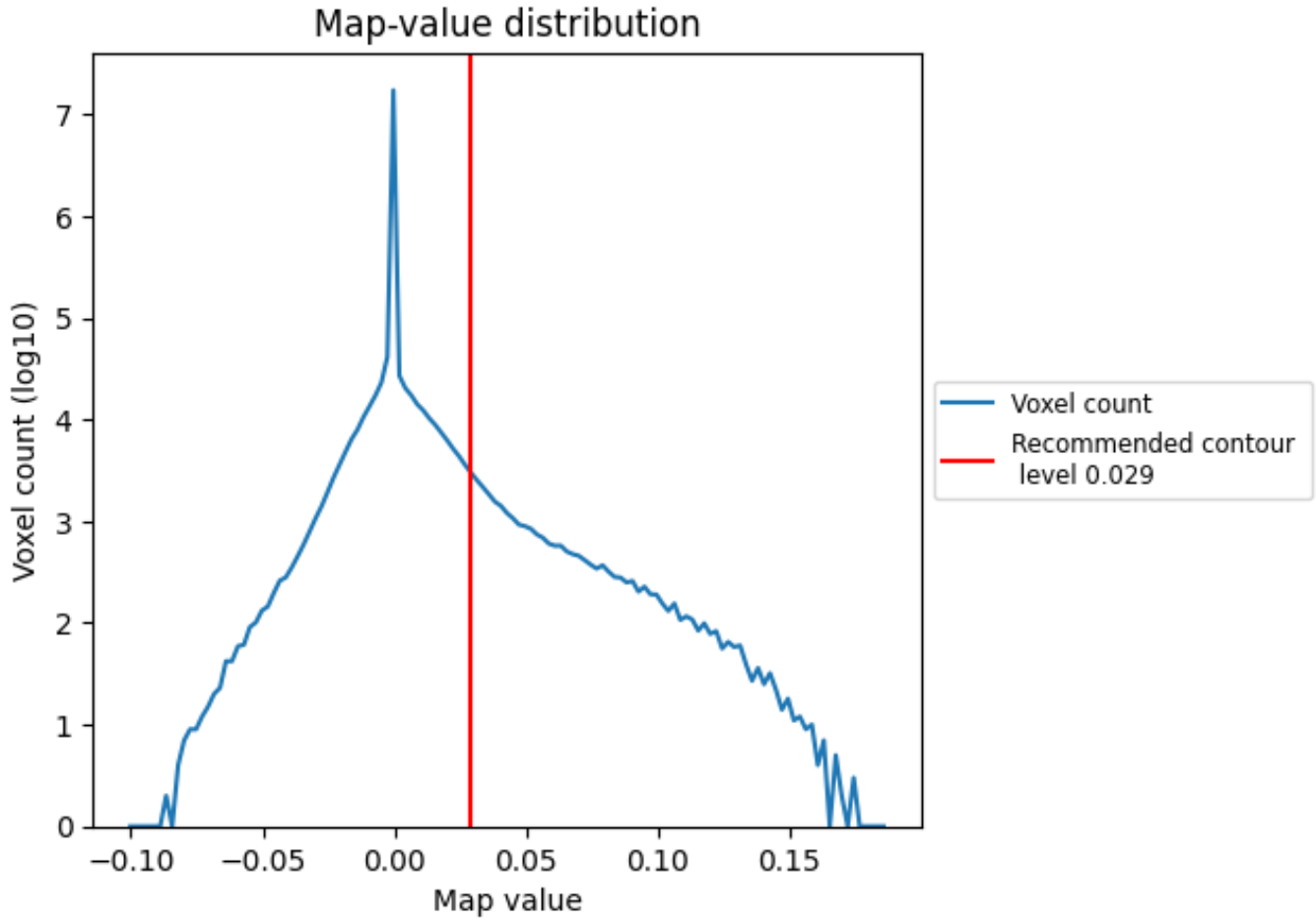


Z

7 Map analysis

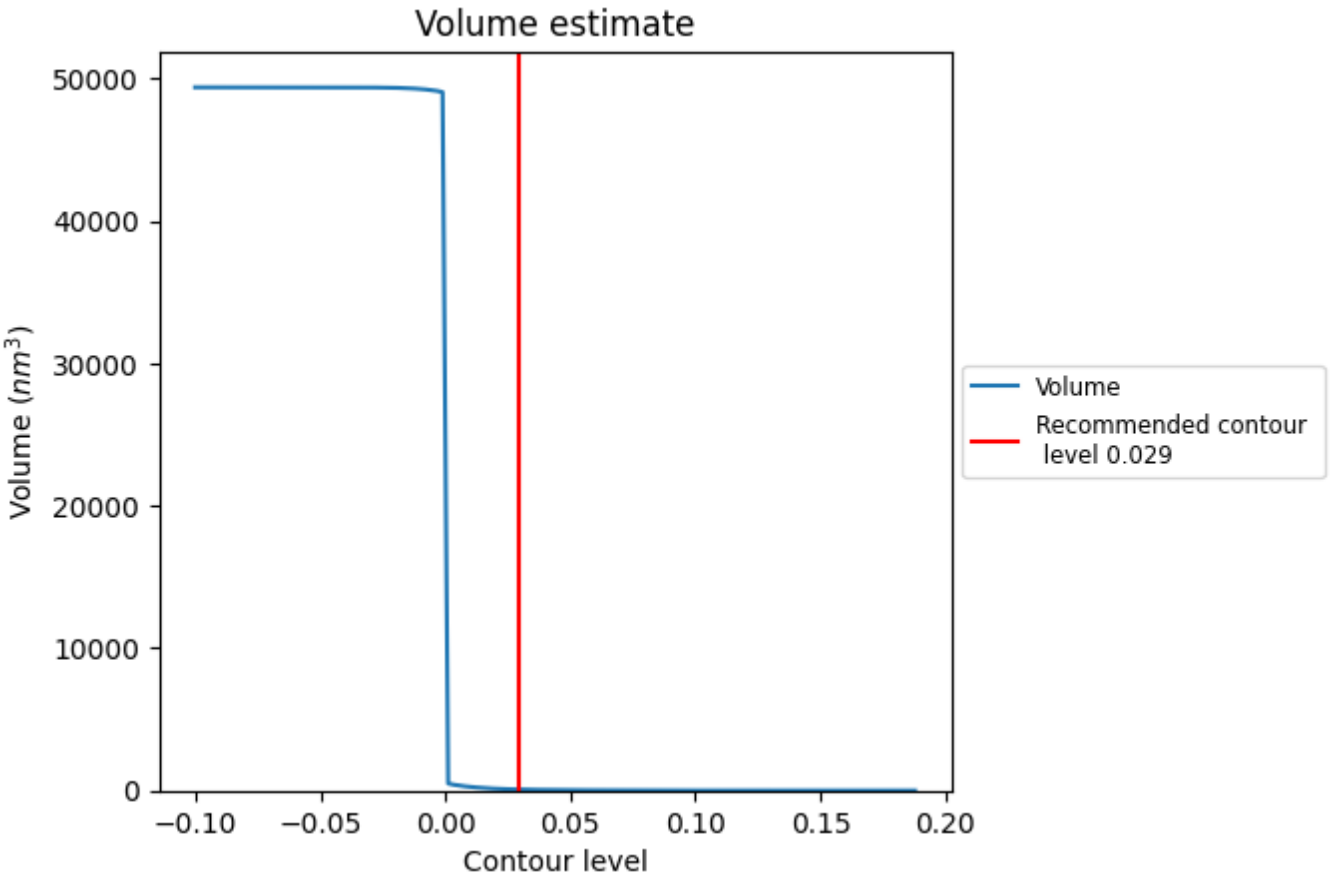
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

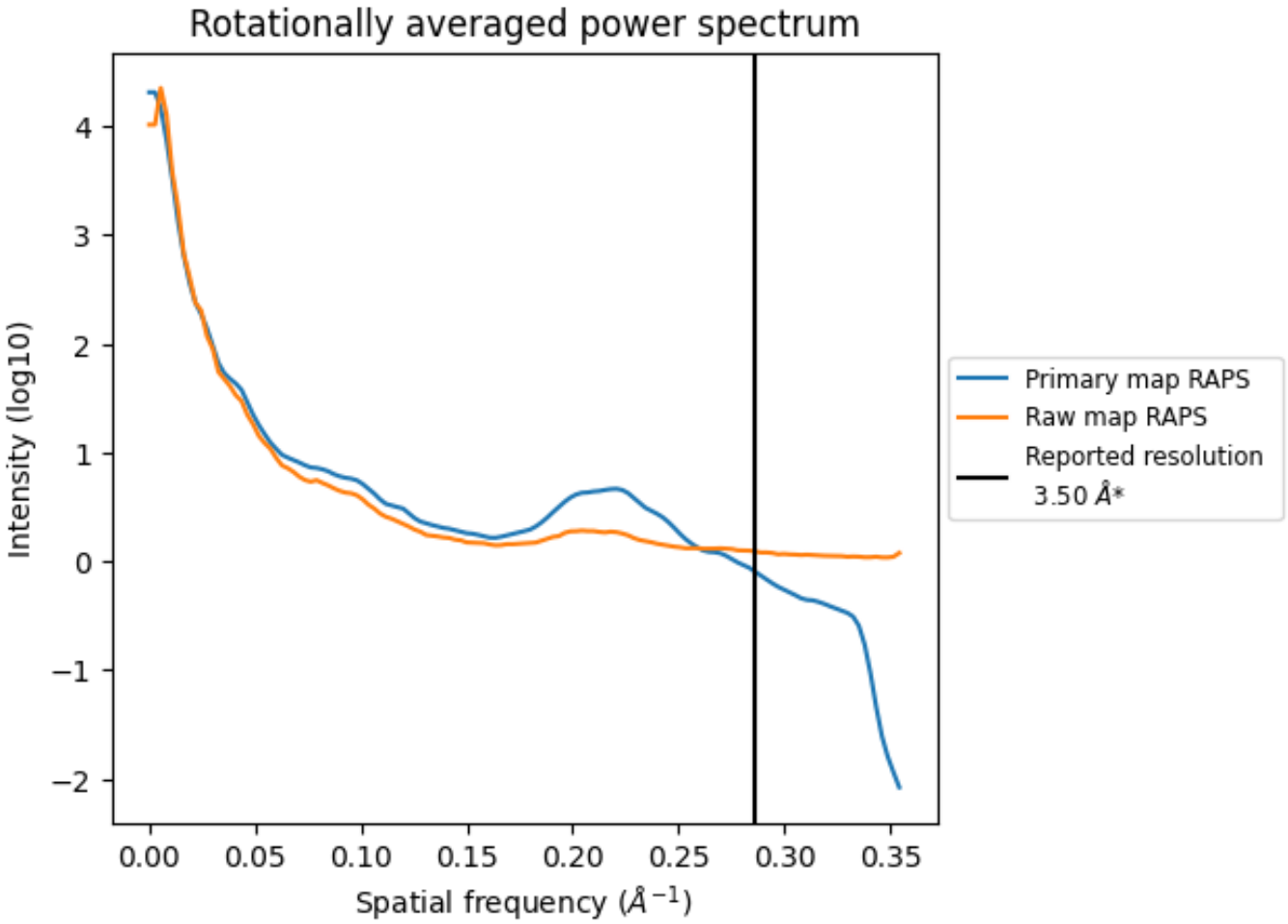
7.2 Volume estimate



The volume at the recommended contour level is 77 nm^3; this corresponds to an approximate mass of 70 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

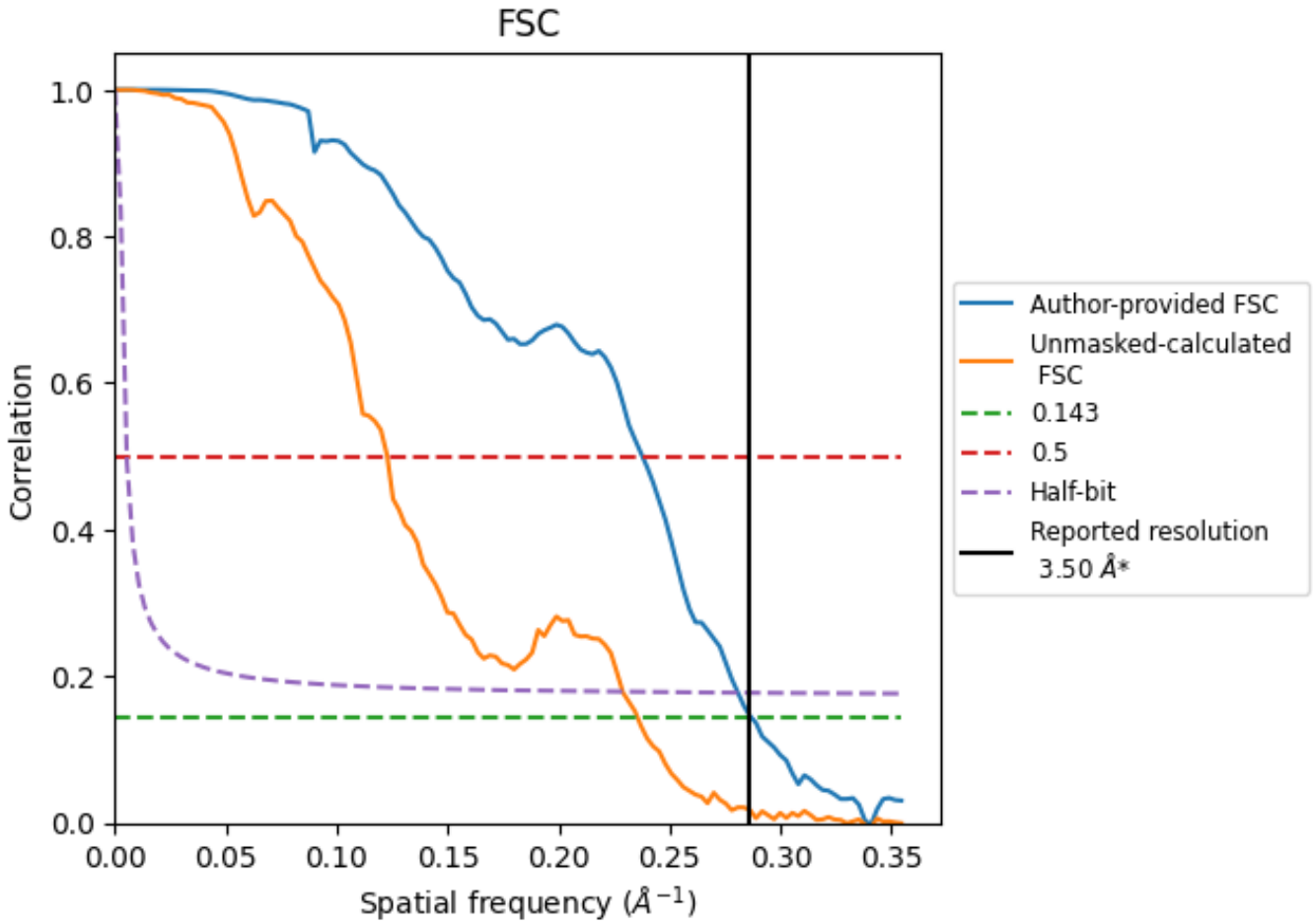


*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

8.2 Resolution estimates (i)

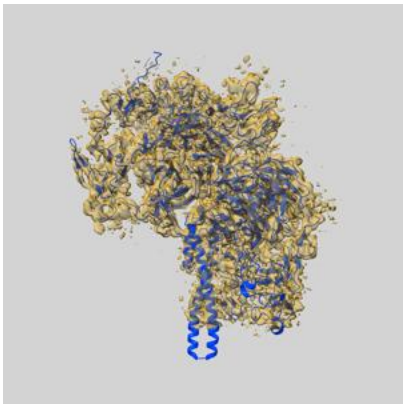
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	3.49	4.21	3.56
Unmasked-calculated*	4.24	8.15	4.37

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.24 differs from the reported value 3.5 by more than 10 %

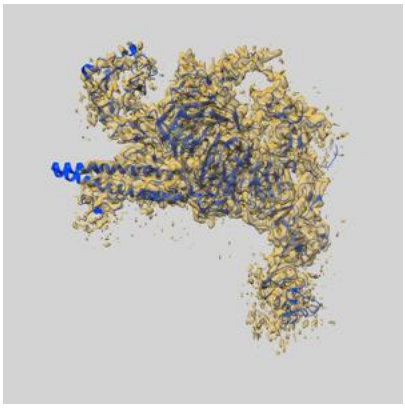
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-36701 and PDB model 8JXH. Per-residue inclusion information can be found in section 3 on page 8.

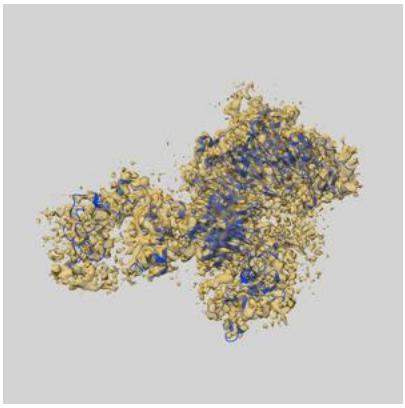
9.1 Map-model overlay



X



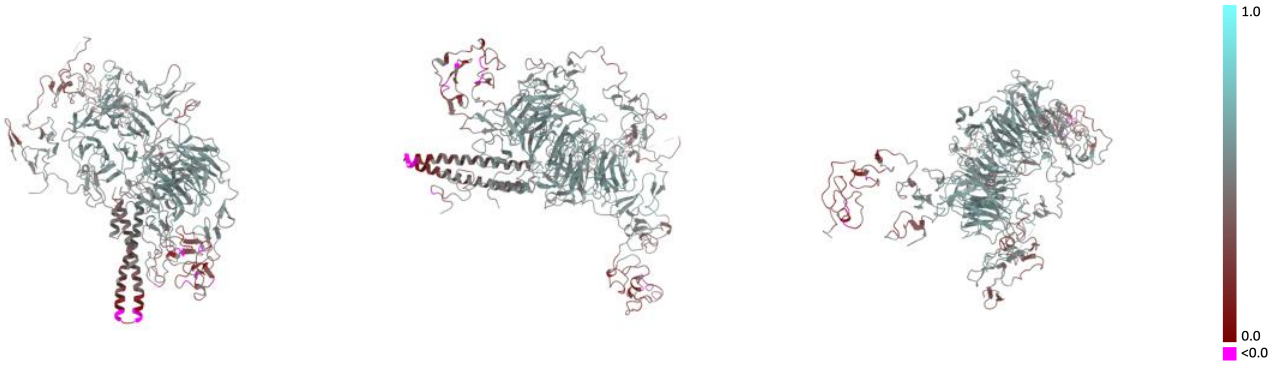
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.029 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

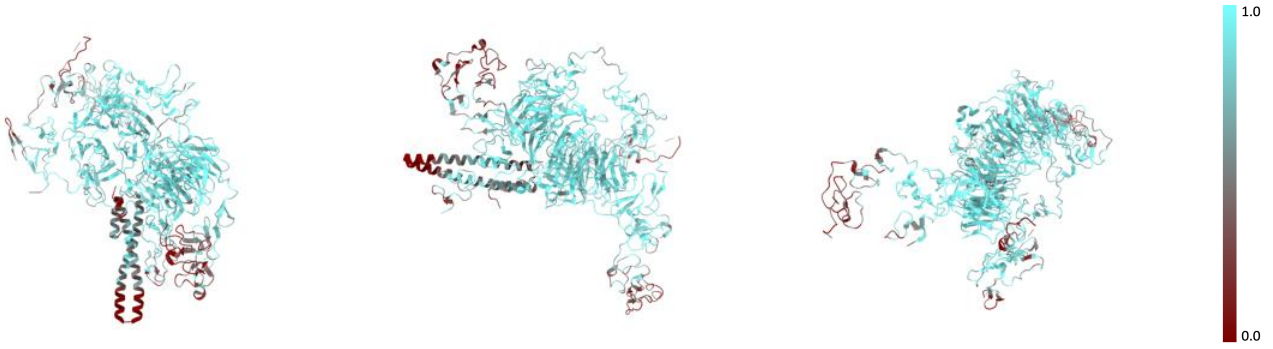
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

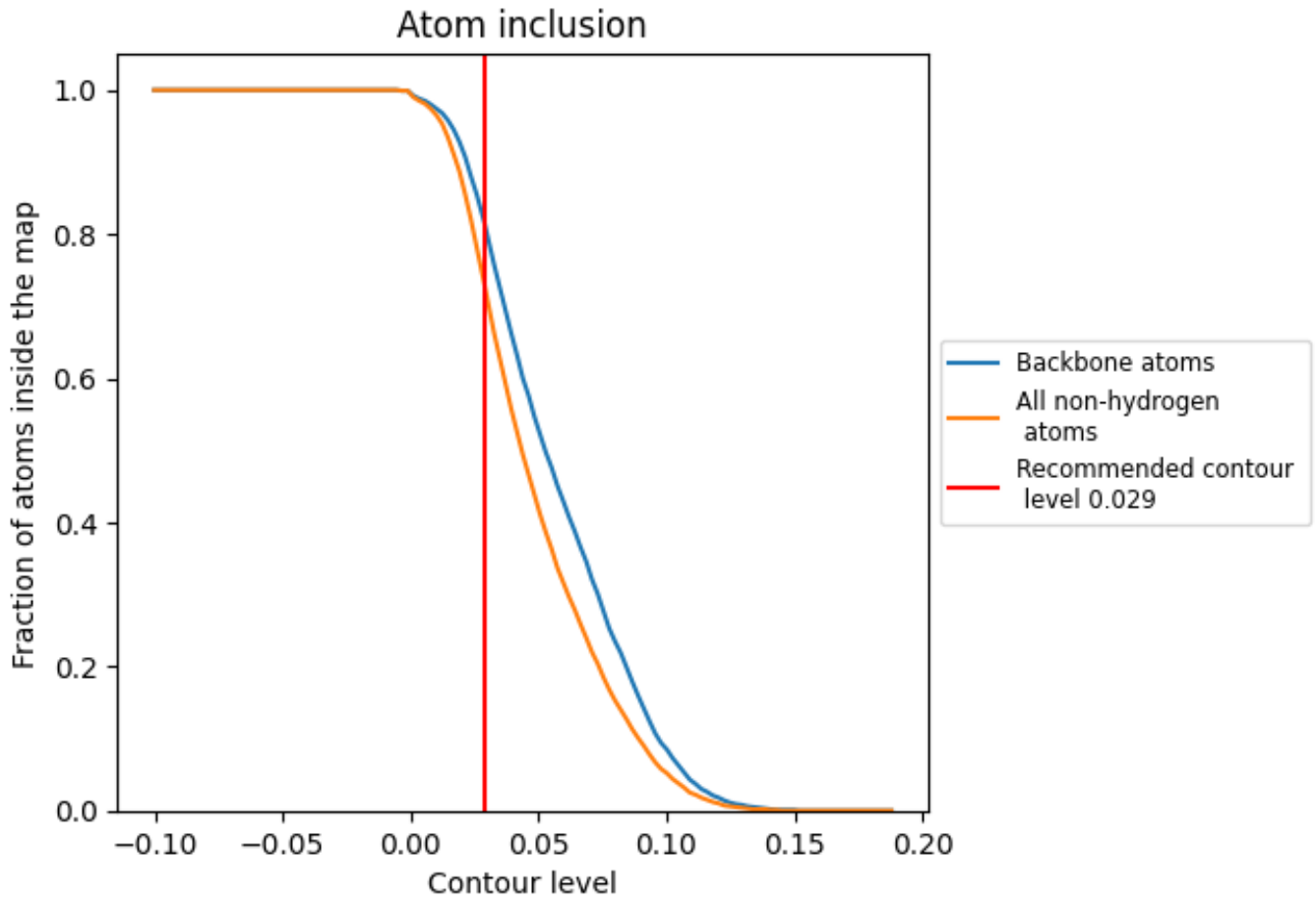
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.029).

9.4 Atom inclusion (i)



At the recommended contour level, 81% of all backbone atoms, 73% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.029) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7280	0.4720
A	0.5770	0.3550
B	0.7800	0.5000
C	0.5360	0.3450
D	0.4330	0.3610
E	0.6920	0.4500
F	0.1790	0.1630
G	0.3770	0.3750
Q	0.9000	0.5590
R	0.9290	0.5520