wwPDB X-ray Structure Validation Summary Report (i)

Feb 1, 2016 – 03:38 PM GMT

PDB ID	:	4CR7
Title	:	Crystal structure of the N-acetyl-D-mannosamine dehydrogenase with n-acetylmannosamine
Authors	:	Gil-Ortiz, F.; Sola-Carvajal, A.; Garcia-Carmona, F.; Sanchez-Ferrer, A.; Rubio, V.
Deposited on	:	2014-02-25
Resolution	:	2.15 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
http://wwpdb.org/validation/2016/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

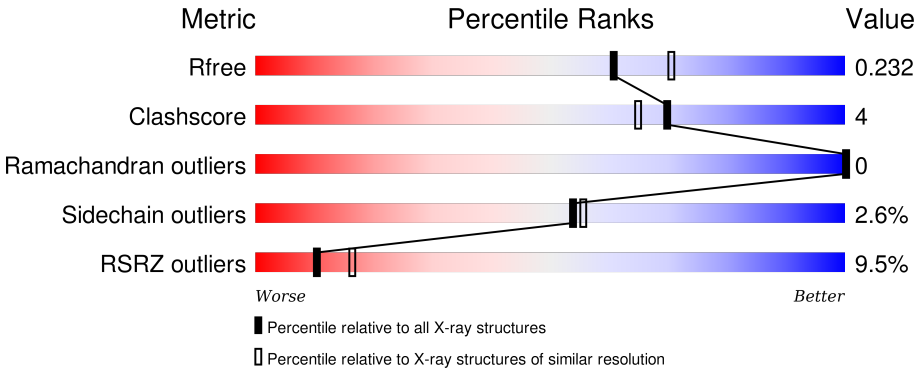
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	trunk26865

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	91344	1045 (2.16-2.16)
Clashscore	102246	1152 (2.16-2.16)
Ramachandran outliers	100387	1131 (2.16-2.16)
Sidechain outliers	100360	1131 (2.16-2.16)
RSRZ outliers	91569	1050 (2.16-2.16)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria. 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	271	10% 84% 11% ·
1	B	271	10% 86% 10% ·
1	C	271	7% 86% 9% 5%
1	D	271	7% 86% 8% 5%
1	E	271	7% 88% 7% · ·

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Mol	Chain	Length	Quality of chain
1	F	271	5% 85% 9%
1	G	271	10% 87% 7% 5%
1	H	271	9% 87% 7% 5%
1	I	271	10% 88% 8%
1	J	271	11% 88% 7%
1	K	271	13% 85% 10%
1	L	271	11% 86% 9%
1	M	271	7% 87% 8%
1	N	271	9% 87% 8%
1	O	271	9% 88% 8%
1	P	271	10% 88% 7%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	PG4	A	1272	-	-	-	X
2	PG4	F	1272	-	-	-	X
2	PG4	F	1273	-	-	-	X
2	PG4	F	1276	-	-	-	X
2	PG4	F	1277	-	-	-	X
2	PG4	G	1272	-	-	-	X
2	PG4	I	1272	-	-	-	X
2	PG4	P	1272	-	-	-	X
3	BM3	A	1273	-	-	-	X
3	BM3	B	1273	-	-	-	X
3	BM3	C	1272	-	-	-	X
3	BM3	D	1272	X	-	-	X
3	BM3	F	1275	-	-	-	X
3	BM3	G	1273	X	-	-	X
3	BM3	H	1273	-	-	-	X
3	BM3	I	1273	X	-	-	X
3	BM3	J	1273	-	-	-	X
3	BM3	L	1272	X	-	-	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	BM3	M	1272	X	-	-	X
3	BM3	N	1272	-	-	-	X
3	BM3	O	1272	-	-	-	X
4	MAN	D	1273	-	-	-	X
4	MAN	M	1273	-	-	X	X
4	MAN	N	1273	-	-	-	X
4	MAN	P	1274	-	-	-	X

2 Entry composition

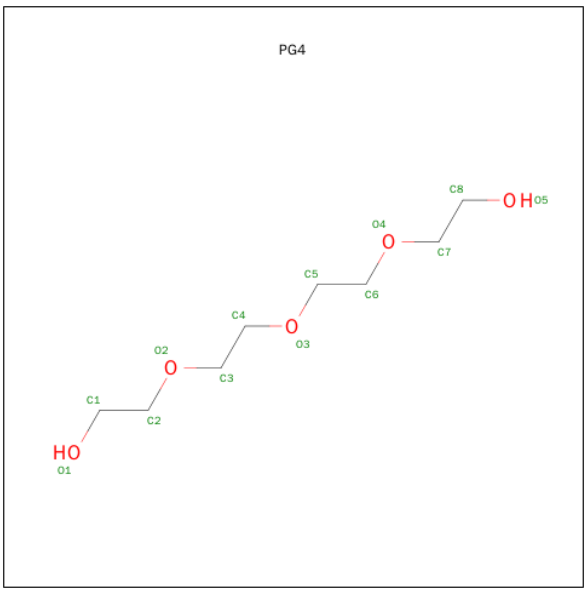
There are 5 unique types of molecules in this entry. The entry contains 30349 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 N-ACYLMANNOSAMINE 1-DEHYDROGENASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	260	Total	C	N	O	S	0	0	0
			1823	1130	327	354	12			
1	B	260	Total	C	N	O	S	0	0	0
			1819	1130	327	350	12			
1	C	257	Total	C	N	O	S	0	0	0
			1806	1123	323	348	12			
1	D	257	Total	C	N	O	S	0	1	0
			1818	1129	327	350	12			
1	E	259	Total	C	N	O	S	0	0	0
			1821	1130	326	353	12			
1	F	259	Total	C	N	O	S	0	1	0
			1832	1137	330	353	12			
1	G	258	Total	C	N	O	S	0	0	0
			1813	1127	325	349	12			
1	H	257	Total	C	N	O	S	0	0	0
			1807	1123	324	348	12			
1	I	261	Total	C	N	O	S	0	1	0
			1827	1136	325	353	13			
1	J	260	Total	C	N	O	S	0	0	0
			1826	1133	327	354	12			
1	K	260	Total	C	N	O	S	0	3	0
			1828	1138	327	350	13			
1	L	259	Total	C	N	O	S	0	0	0
			1819	1130	326	351	12			
1	M	260	Total	C	N	O	S	0	0	0
			1829	1135	329	353	12			
1	N	260	Total	C	N	O	S	0	0	0
			1826	1133	327	354	12			
1	O	260	Total	C	N	O	S	0	0	0
			1826	1133	327	354	12			
1	P	260	Total	C	N	O	S	0	0	0
			1826	1133	327	354	12			

- Molecule 2 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 7 4 3	0	0
2	B	1	Total C O 7 4 3	0	0
2	E	1	Total C O 7 4 3	0	0
2	F	1	Total C O 13 8 5	0	0
2	F	1	Total C O 7 4 3	0	0
2	F	1	Total C O 7 4 3	0	0
2	G	1	Total C O 7 4 3	0	0
2	H	1	Total C O 7 4 3	0	0
2	I	1	Total C O 7 4 3	0	0
2	J	1	Total C O 7 4 3	0	0
2	K	1	Total C O 7 4 3	0	0
2	P	1	Total C O 7 4 3	0	0
2	F	1	Total C O 7 4 3	0	0

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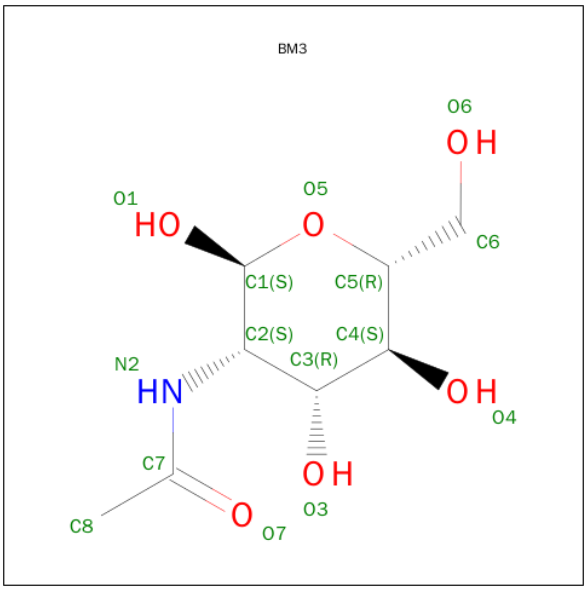
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	F	1	Total C O 7 4 3	0	0

- Molecule 3 is 2-(ACETYLAMINO)-2-DEOXY-ALPHA-D-MANNOPYRANOSE (three-letter code: BM3) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 15 8 1 6	0	0
3	B	1	Total C N O 15 8 1 6	0	0
3	C	1	Total C N O 15 8 1 6	0	0
3	D	1	Total C N O 15 8 1 6	0	0
3	E	1	Total C N O 15 8 1 6	0	0
3	F	1	Total C N O 15 8 1 6	0	0
3	G	1	Total C N O 15 8 1 6	0	0
3	H	1	Total C N O 15 8 1 6	0	0
3	I	1	Total C N O 15 8 1 6	0	0
3	J	1	Total C N O 15 8 1 6	0	0

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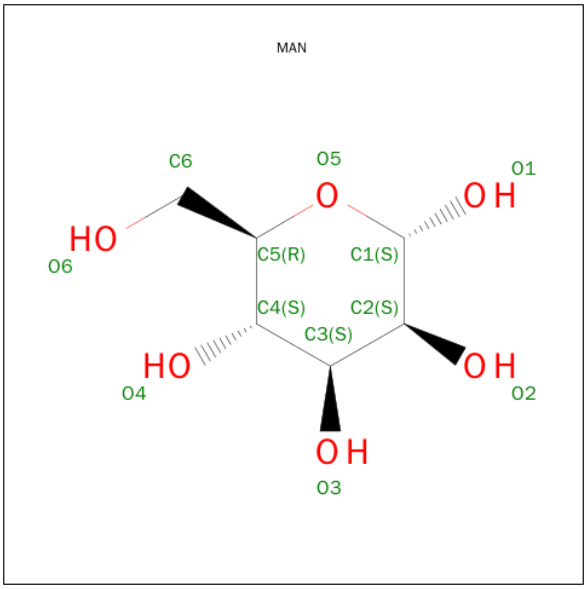
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	K	1	Total C N O 15 8 1 6	0	0
3	L	1	Total C N O 15 8 1 6	0	0
3	M	1	Total C N O 15 8 1 6	0	0
3	N	1	Total C N O 15 8 1 6	0	0
3	O	1	Total C N O 15 8 1 6	0	0
3	P	1	Total C N O 15 8 1 6	0	0

- Molecule 4 is SUGAR (ALPHA-D-MANNOSE) (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	1	Total C O 12 6 6	0	0
4	M	1	Total C O 12 6 6	0	0
4	N	1	Total C O 12 6 6	0	0
4	P	1	Total C O 12 6 6	0	0

- Molecule 5 is water.

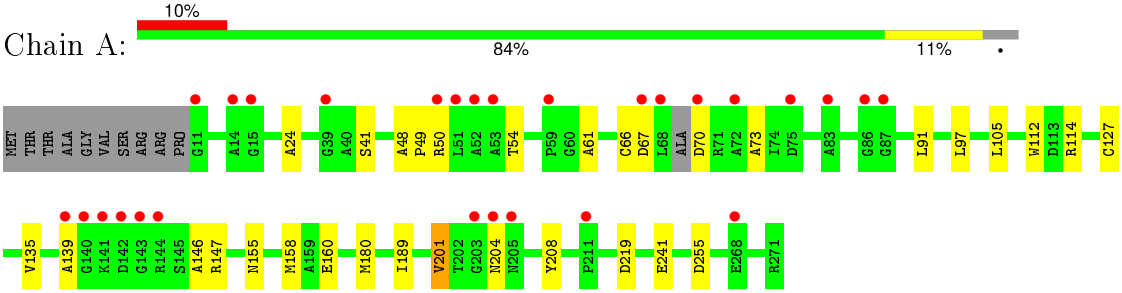
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	52	Total O 52 52	0	0
5	B	59	Total O 59 59	0	0
5	C	51	Total O 51 51	0	0
5	D	62	Total O 62 62	0	0
5	E	55	Total O 55 55	0	0
5	F	53	Total O 53 53	0	0
5	G	55	Total O 55 55	0	0
5	H	45	Total O 45 45	0	0
5	I	61	Total O 61 61	0	0
5	J	53	Total O 53 53	0	0
5	K	53	Total O 53 53	0	0
5	L	52	Total O 52 52	0	0
5	M	40	Total O 40 40	0	0
5	N	41	Total O 41 41	0	0
5	O	33	Total O 33 33	0	0
5	P	46	Total O 46 46	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

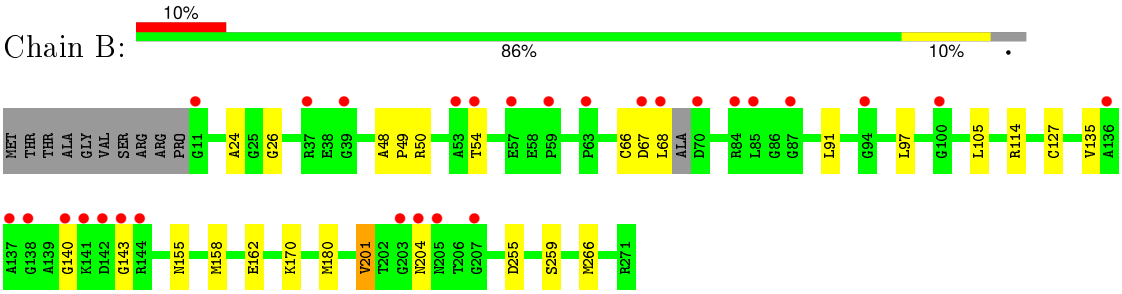
- Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain A:



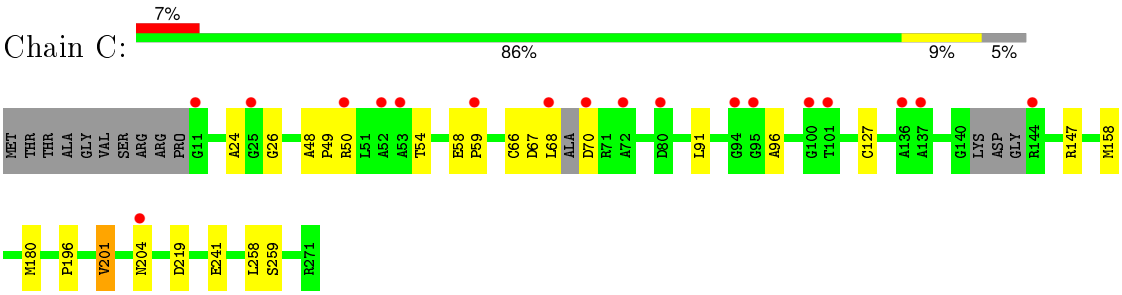
- Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain B:



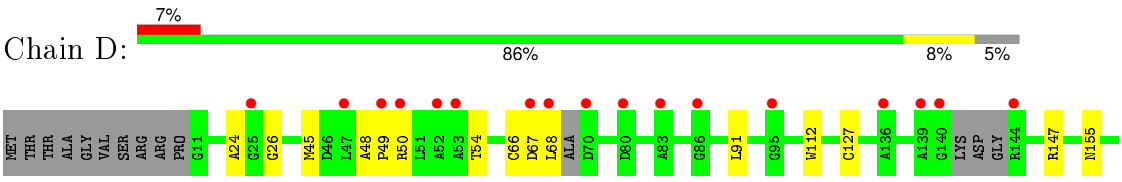
- Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

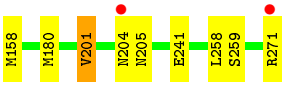
Chain C:



- Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

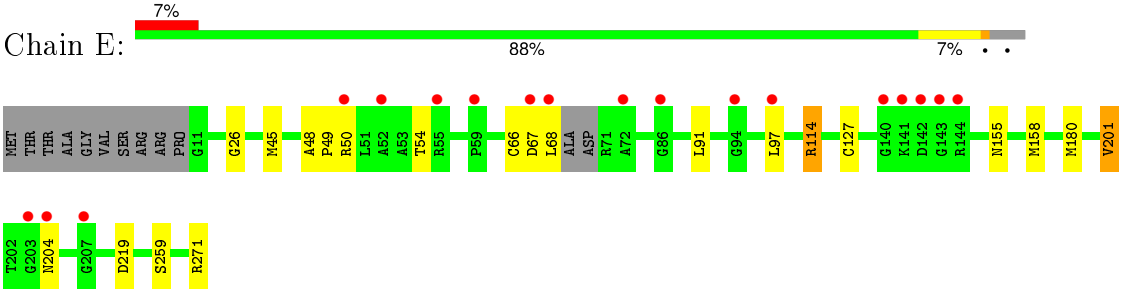
Chain D:





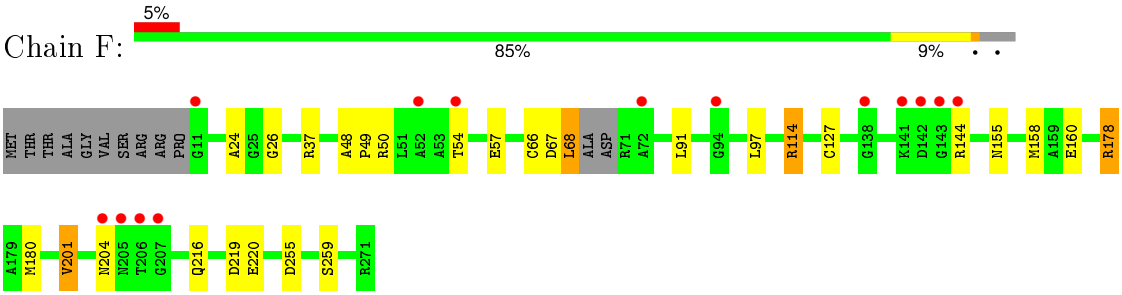
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain E:



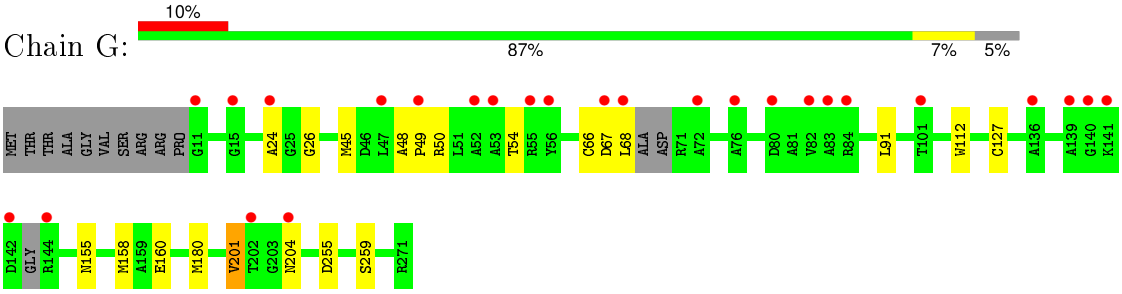
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain F:



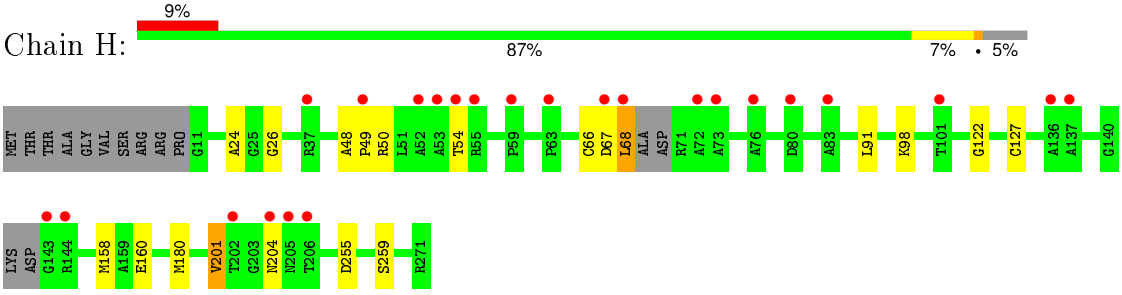
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain G:



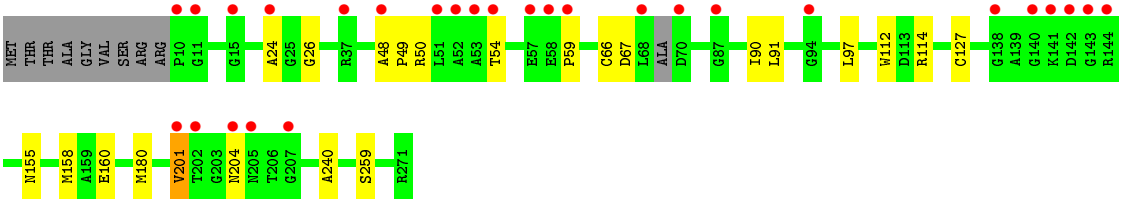
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain H:



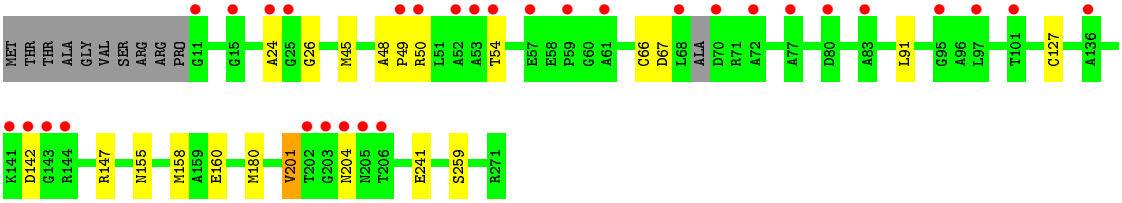
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain I:



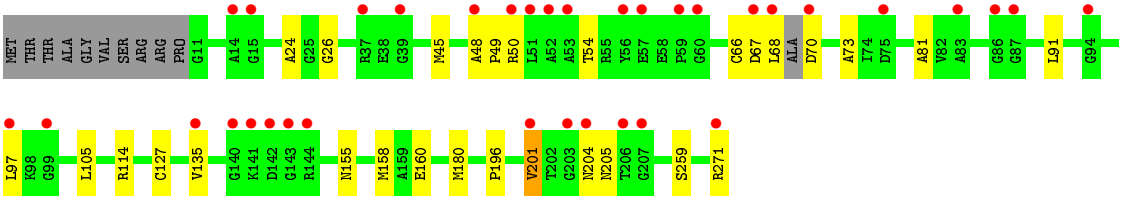
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain J:



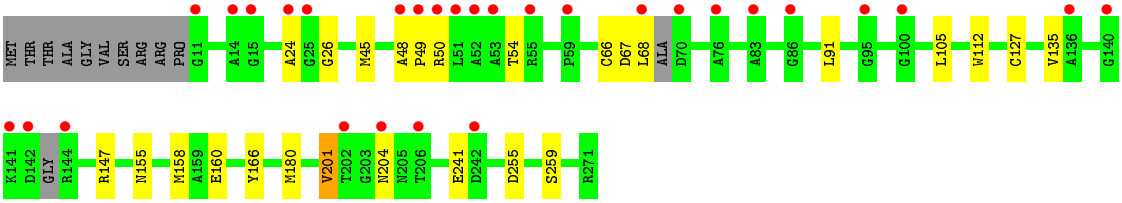
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain K:



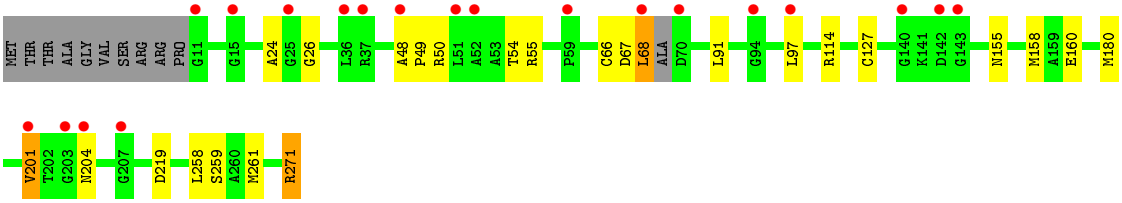
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain L:



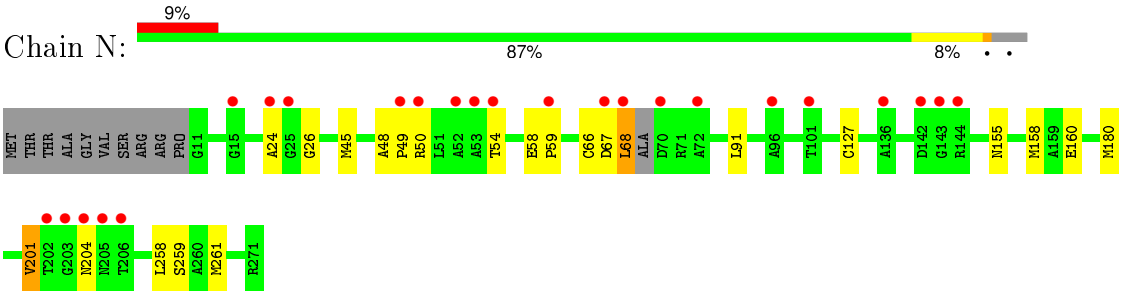
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain M:



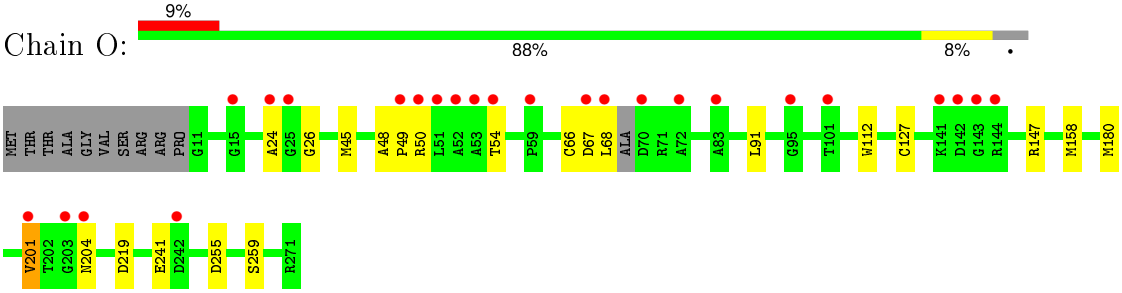
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain N:



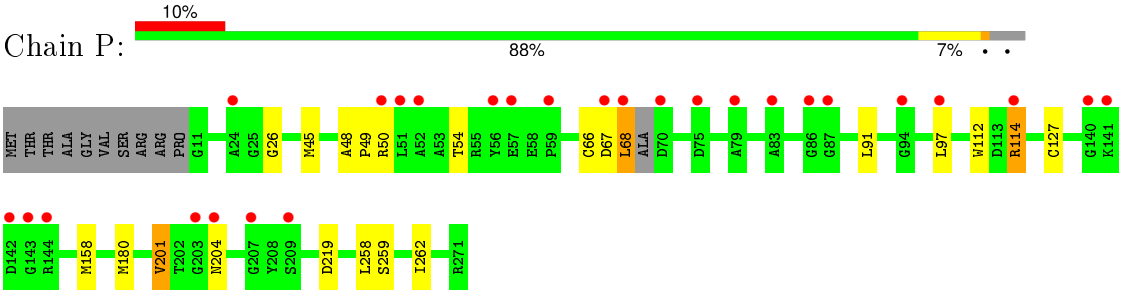
• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain O:



• Molecule 1: N-ACYLMANNOSAMINE 1-DEHYDROGENASE

Chain P:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	99.39Å 100.12Å 111.60Å 67.43° 89.75° 72.46°	Depositor
Resolution (Å)	15.00 – 2.15 15.00 – 2.15	Depositor EDS
% Data completeness (in resolution range)	97.7 (15.00-2.15) 83.3 (15.00-2.15)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.50 (at 2.16Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.201 , 0.231 0.203 , 0.232	Depositor DCC
R_{free} test set	10008 reflections (5.29%)	DCC
Wilson B-factor (Å^2)	23.9	Xtriage
Anisotropy	0.040	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.45 , 63.4	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Outliers	0 of 199177 reflections	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	30349	wwPDB-VP
Average B, all atoms (Å^2)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 78.03 % of the origin peak, indicating pseudo translational symmetry.The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 7.5268e-07.The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BM3, PG4, MAN

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	A	0.60	1/1844 (0.1%)	0.73	3/2498 (0.1%)
1	B	0.60	0/1840	0.69	1/2493 (0.0%)
1	C	0.60	0/1826	0.68	0/2472
1	D	0.62	1/1840 (0.1%)	0.70	0/2487
1	E	0.59	0/1842	0.69	1/2495 (0.0%)
1	F	0.61	0/1853	0.70	4/2510 (0.2%)
1	G	0.63	1/1833 (0.1%)	0.70	1/2483 (0.0%)
1	H	0.59	0/1827	0.72	1/2474 (0.0%)
1	I	0.58	1/1851 (0.1%)	0.69	0/2508
1	J	0.60	0/1847	0.69	0/2502
1	K	0.59	0/1857	0.68	0/2515
1	L	0.63	1/1839 (0.1%)	0.70	1/2490 (0.0%)
1	M	0.62	0/1850	0.74	4/2505 (0.2%)
1	N	0.60	0/1847	0.69	0/2502
1	O	0.61	1/1847 (0.1%)	0.69	2/2502 (0.1%)
1	P	0.59	1/1847 (0.1%)	0.68	0/2502
All	All	0.60	7/29490 (0.0%)	0.70	18/39938 (0.0%)

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	112	TRP	CD2-CE2	5.93	1.48	1.41
1	P	112	TRP	CD2-CE2	5.76	1.48	1.41
1	I	112	TRP	CD2-CE2	5.56	1.48	1.41
1	O	112	TRP	CD2-CE2	5.51	1.48	1.41
1	D	112	TRP	CD2-CE2	5.23	1.47	1.41

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	201	VAL	CG1-CB-CG2	10.80	128.17	110.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	M	271	ARG	NE-CZ-NH2	-7.39	116.61	120.30
1	M	271	ARG	NE-CZ-NH1	6.51	123.55	120.30
1	B	255	ASP	CB-CG-OD1	6.40	124.06	118.30
1	M	219	ASP	CB-CG-OD1	5.91	123.61	118.30

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	A	1823	0	1813	19	0
1	B	1819	0	1816	18	0
1	C	1806	0	1808	15	2
1	D	1818	0	1825	18	0
1	E	1821	0	1820	12	0
1	F	1832	0	1834	18	0
1	G	1813	0	1814	13	0
1	H	1807	0	1813	13	0
1	I	1827	0	1820	15	0
1	J	1826	0	1822	17	0
1	K	1828	0	1832	21	0
1	L	1819	0	1816	18	0
1	M	1829	0	1829	18	0
1	N	1826	0	1822	19	0
1	O	1826	0	1822	12	0
1	P	1826	0	1822	19	1
2	A	7	0	9	1	0
2	B	7	0	9	1	0
2	E	7	0	9	0	0
2	F	41	0	54	2	0
2	G	7	0	9	0	0
2	H	7	0	9	0	0
2	I	7	0	9	0	0
2	J	7	0	9	0	0
2	K	7	0	9	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	P	7	0	9	0	0
3	A	15	0	15	3	0
3	B	15	0	15	1	0
3	C	15	0	15	0	0
3	D	15	0	15	0	0
3	E	15	0	15	1	0
3	F	15	0	15	1	0
3	G	15	0	14	1	0
3	H	15	0	15	1	0
3	I	15	0	15	1	0
3	J	15	0	15	2	0
3	K	15	0	15	1	0
3	L	15	0	14	3	0
3	M	15	0	14	1	0
3	N	15	0	15	2	0
3	O	15	0	15	0	0
3	P	15	0	15	0	0
4	D	12	0	12	4	0
4	M	12	0	12	6	0
4	N	12	0	12	4	0
4	P	12	0	12	3	1
5	A	52	0	0	3	0
5	B	59	0	0	3	0
5	C	51	0	0	2	2
5	D	62	0	0	2	0
5	E	55	0	0	1	0
5	F	53	0	0	2	0
5	G	55	0	0	0	0
5	H	45	0	0	1	0
5	I	61	0	0	1	0
5	J	53	0	0	0	0
5	K	53	0	0	0	0
5	L	52	0	0	0	0
5	M	40	0	0	0	0
5	N	41	0	0	1	0
5	O	33	0	0	0	0
5	P	46	0	0	1	2
All	All	30349	0	29548	264	4

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 4.

The worst 5 of 264 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)
1:M:258:LEU:O	4:M:1273:MAN:O4	1.70	1.07
1:D:258:LEU:O	4:D:1273:MAN:O4	1.75	1.03
1:N:258:LEU:O	4:N:1273:MAN:O4	1.75	1.03
1:C:66:CYS:SG	1:C:67:ASP:N	2.52	0.82
1:B:50:ARG:O	1:B:54:THR:HG23	1.81	0.81

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:C:2032:HOH:O	5:P:2037:HOH:O[1_545]	1.22	0.98
1:C:219:ASP:OD2	5:P:2037:HOH:O[1_545]	1.99	0.21
1:C:258:LEU:O	4:P:1274:MAN:O2[1_545]	2.14	0.06
1:P:219:ASP:OD2	5:C:2032:HOH:O[1_565]	2.14	0.06

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 X-ray entries followed by that with respect to entries of similar resolution.

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	A	256/271 (94%)	249 (97%)	7 (3%)	0	100	100
1	B	256/271 (94%)	244 (95%)	12 (5%)	0	100	100
1	C	251/271 (93%)	243 (97%)	8 (3%)	0	100	100
1	D	251/271 (93%)	243 (97%)	8 (3%)	0	100	100
1	E	255/271 (94%)	248 (97%)	7 (3%)	0	100	100
1	F	256/271 (94%)	249 (97%)	7 (3%)	0	100	100
1	G	252/271 (93%)	242 (96%)	10 (4%)	0	100	100
1	H	251/271 (93%)	241 (96%)	10 (4%)	0	100	100
1	I	258/271 (95%)	248 (96%)	10 (4%)	0	100	100
1	J	256/271 (94%)	247 (96%)	9 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	K	258/271 (95%)	251 (97%)	7 (3%)	0	100	100
1	L	253/271 (93%)	244 (96%)	9 (4%)	0	100	100
1	M	256/271 (94%)	248 (97%)	8 (3%)	0	100	100
1	N	256/271 (94%)	247 (96%)	9 (4%)	0	100	100
1	O	256/271 (94%)	247 (96%)	9 (4%)	0	100	100
1	P	256/271 (94%)	248 (97%)	8 (3%)	0	100	100
All	All	4077/4336 (94%)	3939 (97%)	138 (3%)	0	100	100

There are no Ramachandran outliers to report.

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 X-ray entries followed by that with respect to entries of similar resolution.

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	A	170/183 (93%)	167 (98%)	3 (2%)	66	71
1	B	169/183 (92%)	165 (98%)	4 (2%)	57	60
1	C	169/183 (92%)	165 (98%)	4 (2%)	57	60
1	D	171/183 (93%)	165 (96%)	6 (4%)	43	41
1	E	171/183 (93%)	165 (96%)	6 (4%)	43	41
1	F	172/183 (94%)	164 (95%)	8 (5%)	32	28
1	G	170/183 (93%)	166 (98%)	4 (2%)	57	60
1	H	170/183 (93%)	166 (98%)	4 (2%)	57	60
1	I	170/183 (93%)	167 (98%)	3 (2%)	66	71
1	J	171/183 (93%)	167 (98%)	4 (2%)	58	62
1	K	171/183 (93%)	163 (95%)	8 (5%)	32	28
1	L	170/183 (93%)	166 (98%)	4 (2%)	57	60
1	M	171/183 (93%)	167 (98%)	4 (2%)	58	62
1	N	171/183 (93%)	167 (98%)	4 (2%)	58	62
1	O	171/183 (93%)	167 (98%)	4 (2%)	58	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	P	171/183 (93%)	166 (97%)	5 (3%)	50 49
All	All	2728/2928 (93%)	2653 (97%)	75 (3%)	54 53

5 of 75 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	201	VAL
1	I	204	ASN
1	O	204	ASN
1	G	204	ASN
1	H	204	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	204	ASN
1	H	216	GLN
1	M	204	ASN
1	F	204	ASN
1	N	204	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)

There are no carbohydrates in this entry.

5.6 Ligand geometry (i)

34 ligands 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	$\#\|Z\| > 2$
2	PG4	A	1272	-	6,6,12	0.73	0	5,5,11	0.35	0
3	BM3	A	1273	-	15,15,15	2.76	4 (26%)	17,21,21	1.72	3 (17%)
2	PG4	B	1272	-	6,6,12	0.67	0	5,5,11	0.11	0
3	BM3	B	1273	-	15,15,15	2.81	2 (13%)	17,21,21	1.92	5 (29%)
3	BM3	C	1272	-	15,15,15	2.59	3 (20%)	17,21,21	1.75	3 (17%)
3	BM3	D	1272	-	15,15,15	2.46	4 (26%)	17,21,21	1.27	2 (11%)
4	MAN	D	1273	-	12,12,12	1.77	2 (16%)	17,17,17	2.68	9 (52%)
2	PG4	E	1272	-	6,6,12	0.58	0	5,5,11	0.21	0
3	BM3	E	1273	-	15,15,15	3.16	2 (13%)	17,21,21	1.16	1 (5%)
2	PG4	F	1272	-	12,12,12	0.74	0	11,11,11	0.44	0
2	PG4	F	1273	-	6,6,12	0.90	0	5,5,11	0.75	0
2	PG4	F	1274	-	6,6,12	0.44	0	5,5,11	0.48	0
3	BM3	F	1275	-	15,15,15	3.04	3 (20%)	17,21,21	1.49	4 (23%)
2	PG4	F	1276	-	6,6,12	0.70	0	5,5,11	0.14	0
2	PG4	F	1277	-	6,6,12	0.77	0	5,5,11	0.22	0
2	PG4	G	1272	-	6,6,12	0.42	0	5,5,11	0.70	0
3	BM3	G	1273	-	15,15,15	2.77	4 (26%)	17,21,21	1.37	1 (5%)
2	PG4	H	1272	-	6,6,12	0.39	0	5,5,11	0.51	0
3	BM3	H	1273	-	15,15,15	2.86	2 (13%)	17,21,21	1.27	1 (5%)
2	PG4	I	1272	-	6,6,12	0.73	0	5,5,11	0.35	0
3	BM3	I	1273	-	15,15,15	3.15	2 (13%)	17,21,21	1.64	2 (11%)
2	PG4	J	1272	-	6,6,12	0.40	0	5,5,11	0.50	0
3	BM3	J	1273	-	15,15,15	2.83	3 (20%)	17,21,21	1.34	3 (17%)
2	PG4	K	1272	-	6,6,12	0.63	0	5,5,11	0.54	0
3	BM3	K	1273	-	15,15,15	2.97	3 (20%)	17,21,21	1.57	3 (17%)
3	BM3	L	1272	-	15,15,15	2.70	4 (26%)	17,21,21	1.39	3 (17%)
3	BM3	M	1272	-	15,15,15	3.08	3 (20%)	17,21,21	1.65	3 (17%)
4	MAN	M	1273	-	12,12,12	1.66	2 (16%)	17,17,17	2.93	8 (47%)
3	BM3	N	1272	-	15,15,15	2.83	3 (20%)	17,21,21	1.50	2 (11%)
4	MAN	N	1273	-	12,12,12	1.57	2 (16%)	17,17,17	2.97	11 (64%)
3	BM3	O	1272	-	15,15,15	2.98	6 (40%)	17,21,21	2.08	4 (23%)
2	PG4	P	1272	-	6,6,12	0.81	0	5,5,11	0.41	0
3	BM3	P	1273	-	15,15,15	2.78	2 (13%)	17,21,21	1.61	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	MAN	P	1274	-	12,12,12	2.21	4 (33%)	17,17,17	2.86	8 (47%)

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
2	PG4	A	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	A	1273	-	-	0/6/26/26	0/1/1/1
2	PG4	B	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	B	1273	-	-	0/6/26/26	0/1/1/1
3	BM3	C	1272	-	-	0/6/26/26	0/1/1/1
3	BM3	D	1272	-	1/1/6/7	0/6/26/26	0/1/1/1
4	MAN	D	1273	-	-	0/2/22/22	0/1/1/1
2	PG4	E	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	E	1273	-	-	0/6/26/26	0/1/1/1
2	PG4	F	1272	-	-	0/10/10/10	0/0/0/0
2	PG4	F	1273	-	-	0/4/4/10	0/0/0/0
2	PG4	F	1274	-	-	0/4/4/10	0/0/0/0
3	BM3	F	1275	-	-	0/6/26/26	0/1/1/1
2	PG4	F	1276	-	-	0/4/4/10	0/0/0/0
2	PG4	F	1277	-	-	0/4/4/10	0/0/0/0
2	PG4	G	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	G	1273	-	1/1/6/7	0/6/26/26	0/1/1/1
2	PG4	H	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	H	1273	-	-	0/6/26/26	0/1/1/1
2	PG4	I	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	I	1273	-	1/1/6/7	0/6/26/26	0/1/1/1
2	PG4	J	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	J	1273	-	-	0/6/26/26	0/1/1/1
2	PG4	K	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	K	1273	-	-	0/6/26/26	0/1/1/1
3	BM3	L	1272	-	1/1/6/7	0/6/26/26	0/1/1/1
3	BM3	M	1272	-	1/1/6/7	0/6/26/26	0/1/1/1
4	MAN	M	1273	-	-	0/2/22/22	0/1/1/1
3	BM3	N	1272	-	-	0/6/26/26	0/1/1/1
4	MAN	N	1273	-	-	0/2/22/22	0/1/1/1
3	BM3	O	1272	-	-	0/6/26/26	0/1/1/1
2	PG4	P	1272	-	-	0/4/4/10	0/0/0/0
3	BM3	P	1273	-	-	0/6/26/26	0/1/1/1
4	MAN	P	1274	-	-	0/2/22/22	0/1/1/1

The worst 5 of 60 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	1273	BM3	C1-C2	-11.32	1.39	1.53
3	E	1273	BM3	C1-C2	-10.96	1.40	1.53
3	M	1272	BM3	C1-C2	-10.46	1.40	1.53
3	F	1275	BM3	C1-C2	-10.42	1.40	1.53
3	K	1273	BM3	C1-C2	-10.32	1.40	1.53

The worst 5 of 78 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	M	1273	MAN	C1-O5-C5	-6.56	101.33	113.47
4	P	1274	MAN	C1-O5-C5	-6.19	102.03	113.47
4	N	1273	MAN	C1-O5-C5	-6.12	102.15	113.47
4	D	1273	MAN	C1-O5-C5	-6.02	102.33	113.47
4	M	1273	MAN	O5-C5-C4	-4.54	101.16	109.68

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	D	1272	BM3	C1
3	M	1272	BM3	C1
3	L	1272	BM3	C1
3	G	1273	BM3	C1
3	I	1273	BM3	C1

There are no torsion outliers.

There are no ring outliers.

19 monomers are involved in 39 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1272	PG4	1	0
3	A	1273	BM3	3	0
2	B	1272	PG4	1	0
3	B	1273	BM3	1	0
4	D	1273	MAN	4	0
3	E	1273	BM3	1	0
2	F	1272	PG4	2	0
3	F	1275	BM3	1	0
3	G	1273	BM3	1	0
3	H	1273	BM3	1	0
3	I	1273	BM3	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	J	1273	BM3	2	0
3	K	1273	BM3	1	0
3	L	1272	BM3	3	0
3	M	1272	BM3	1	0
4	M	1273	MAN	6	0
3	N	1272	BM3	2	0
4	N	1273	MAN	4	0
4	P	1274	MAN	3	1

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 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	260/271 (95%)	0.45	28 (10%) 8 12	12, 26, 55, 68	0
1	B	260/271 (95%)	0.39	28 (10%) 8 12	11, 25, 51, 67	0
1	C	257/271 (94%)	0.28	18 (7%) 19 26	11, 23, 47, 67	0
1	D	257/271 (94%)	0.22	19 (7%) 17 24	10, 21, 47, 64	0
1	E	259/271 (95%)	0.21	18 (6%) 20 27	10, 22, 48, 64	0
1	F	259/271 (95%)	0.17	14 (5%) 29 40	10, 21, 45, 57	0
1	G	258/271 (95%)	0.30	26 (10%) 9 15	11, 23, 49, 65	0
1	H	257/271 (94%)	0.34	24 (9%) 11 17	11, 25, 53, 64	0
1	I	261/271 (96%)	0.43	28 (10%) 8 12	12, 24, 51, 65	0
1	J	260/271 (95%)	0.45	31 (11%) 6 10	12, 25, 52, 66	0
1	K	260/271 (95%)	0.52	35 (13%) 4 7	12, 26, 53, 68	0
1	L	259/271 (95%)	0.44	29 (11%) 7 12	12, 24, 53, 72	0
1	M	260/271 (95%)	0.36	20 (7%) 16 22	12, 24, 47, 62	0
1	N	260/271 (95%)	0.40	24 (9%) 11 17	13, 25, 50, 66	0
1	O	260/271 (95%)	0.31	25 (9%) 10 16	12, 24, 49, 73	0
1	P	260/271 (95%)	0.41	27 (10%) 8 14	12, 25, 54, 68	0
All	All	4147/4336 (95%)	0.35	394 (9%) 10 16	10, 24, 51, 73	0

The worst 5 of 394 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	O	68	LEU	7.3
1	N	53	ALA	6.6
1	B	143	GLY	6.6
1	I	143	GLY	6.5
1	A	144	ARG	6.5

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

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

6.3 Carbohydrates (i)

There are no carbohydrates in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å^2)	Q<0.9
2	PG4	F	1273	7/13	0.77	0.24	8.33	29,32,36,42	7
2	PG4	F	1277	7/13	0.75	0.23	8.28	55,59,67,67	7
4	MAN	D	1273	12/12	0.76	0.26	7.50	21,29,31,34	12
2	PG4	G	1272	7/13	0.80	0.17	7.16	37,37,41,42	7
4	MAN	P	1274	12/12	0.75	0.25	6.97	20,29,31,31	12
4	MAN	N	1273	12/12	0.71	0.27	6.53	20,31,32,32	12
2	PG4	F	1276	7/13	0.88	0.17	6.25	50,52,55,57	7
2	PG4	F	1272	13/13	0.83	0.19	6.03	38,41,42,43	13
4	MAN	M	1273	12/12	0.77	0.24	6.00	18,27,29,30	12
3	BM3	N	1272	15/15	0.73	0.27	4.97	42,47,52,52	0
3	BM3	O	1272	15/15	0.68	0.27	4.82	38,39,41,41	15
2	PG4	I	1272	7/13	0.80	0.18	4.64	31,32,36,36	7
3	BM3	F	1275	15/15	0.75	0.28	4.57	41,43,47,47	15
3	BM3	A	1273	15/15	0.67	0.27	4.12	42,49,52,52	0
3	BM3	D	1272	15/15	0.73	0.26	3.84	37,47,50,50	0
2	PG4	A	1272	7/13	0.80	0.18	3.47	25,29,32,33	7
3	BM3	G	1273	15/15	0.77	0.23	3.42	43,49,52,53	0
3	BM3	J	1273	15/15	0.81	0.27	3.20	47,49,53,54	0
3	BM3	L	1272	15/15	0.76	0.28	3.00	36,40,44,44	15
3	BM3	C	1272	15/15	0.77	0.25	2.91	39,46,47,47	0
3	BM3	M	1272	15/15	0.68	0.22	2.84	44,50,52,53	0
3	BM3	I	1273	15/15	0.75	0.22	2.68	43,47,49,52	15
3	BM3	H	1273	15/15	0.82	0.19	2.60	36,38,41,43	15
2	PG4	P	1272	7/13	0.68	0.17	2.39	35,38,40,40	7

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å^2)	Q<0.9
3	BM3	B	1273	15/15	0.64	0.24	2.36	36,39,41,41	15
3	BM3	P	1273	15/15	0.80	0.20	1.94	34,40,45,45	15
2	PG4	J	1272	7/13	0.89	0.15	1.74	34,35,36,38	7
3	BM3	E	1273	15/15	0.81	0.19	1.41	32,35,39,43	15
3	BM3	K	1273	15/15	0.75	0.21	1.37	37,51,54,54	15
2	PG4	E	1272	7/13	0.85	0.14	1.31	34,35,37,38	7
2	PG4	B	1272	7/13	0.78	0.15	0.89	35,36,37,40	7
2	PG4	K	1272	7/13	0.83	0.14	0.54	32,33,34,34	7
2	PG4	F	1274	7/13	0.94	0.11	0.11	32,35,38,41	7
2	PG4	H	1272	7/13	0.91	0.12	-0.12	37,37,39,40	7

6.5 Other polymers (i)

There are no such residues in this entry.