Full wwPDB X-ray Structure Validation Report ⓘ

May 21, 2020 – 06:30 pm BST

PDB ID	:	2A7K
Title	:	carboxymethylproline synthase (CarB) from pectobacterium carotovora, apo enzyme
Authors	:	Sleeman, M.C.; Sorensen, J.L.; Batchelar, E.T.; McDonough, M.A.; Schofield, C.J.
Deposited on	:	2005-07-05
Resolution	:	2.24 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

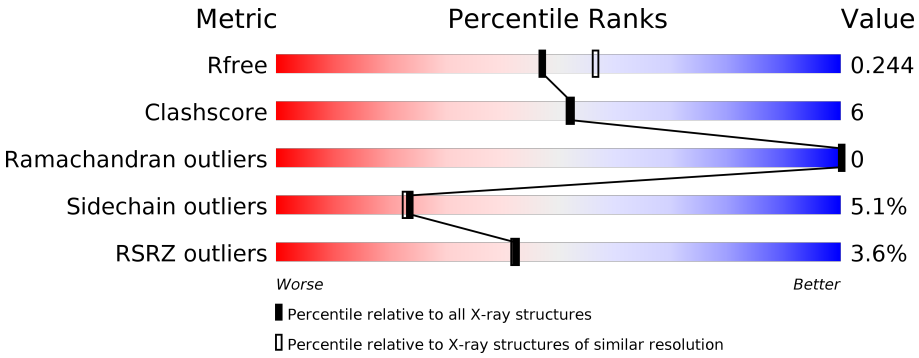
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 2.24 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}	130704	2391 (2.26-2.22)
Clashscore	141614	2539 (2.26-2.22)
Ramachandran outliers	138981	2489 (2.26-2.22)
Sidechain outliers	138945	2490 (2.26-2.22)
RSRZ outliers	127900	2353 (2.26-2.22)

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 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	250	4% 76% 14% • 8%
1	B	250	6% 78% 11% • 8%
1	C	250	2% 82% 13% • 5%
1	D	250	3% 76% 14% • 9%
1	E	250	6% 76% 17% • 6%
1	F	250	2% 78% 12% 10%

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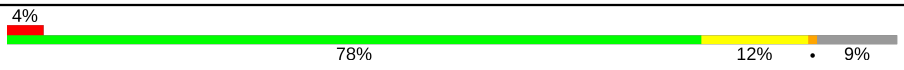
Mol	Chain	Length	Quality of chain
1	G	250	
1	H	250	
1	I	250	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 16704 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 CarB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	229	Total	C	N	O	S	0	0	0
			1756	1104	305	337	10			
1	B	230	Total	C	N	O	S	0	0	0
			1764	1108	310	336	10			
1	C	238	Total	C	N	O	S	0	0	0
			1833	1152	320	351	10			
1	D	228	Total	C	N	O	S	0	0	0
			1752	1102	305	335	10			
1	E	236	Total	C	N	O	S	0	0	0
			1798	1134	311	343	10			
1	F	226	Total	C	N	O	S	0	0	0
			1745	1097	303	335	10			
1	G	228	Total	C	N	O	S	0	0	0
			1726	1087	302	327	10			
1	H	231	Total	C	N	O	S	0	0	0
			1769	1114	305	340	10			
1	I	228	Total	C	N	O	S	0	0	0
			1755	1105	305	335	10			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	82	Total	O	0	0
			82	82		
2	B	102	Total	O	0	0
			102	102		
2	C	96	Total	O	0	0
			96	96		
2	D	117	Total	O	0	0
			117	117		
2	E	80	Total	O	0	0
			80	80		

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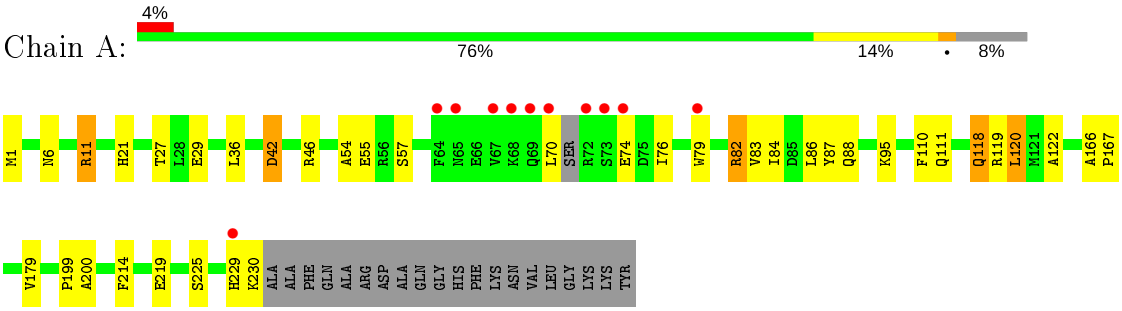
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	F	83	Total O 83 83	0	0
2	G	77	Total O 77 77	0	0
2	H	80	Total O 80 80	0	0
2	I	89	Total O 89 89	0	0

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 the various outlier classes 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.

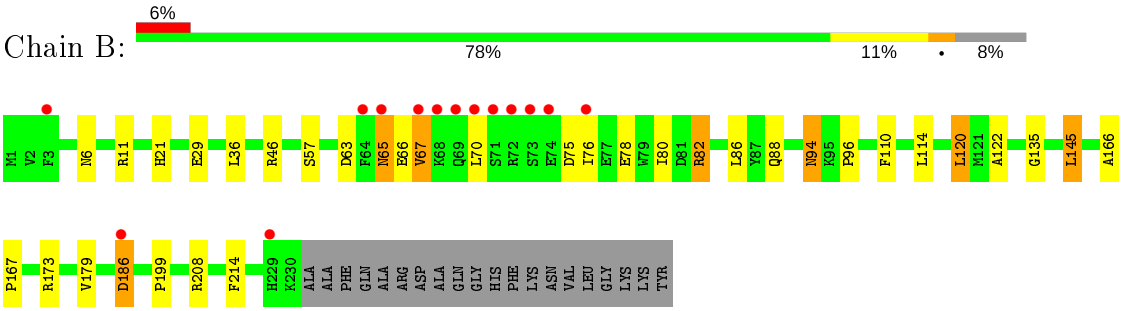
- Molecule 1: CarB

Chain A:



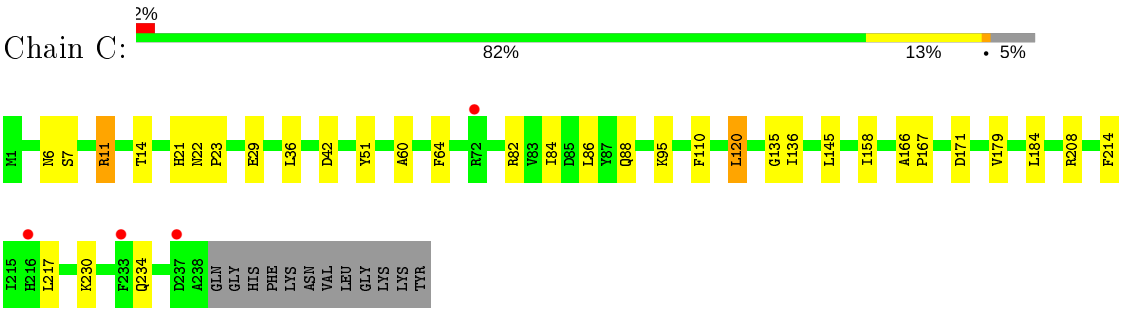
- Molecule 1: CarB

Chain B:



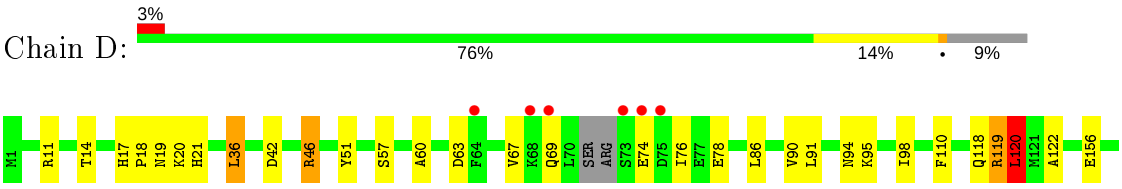
- Molecule 1: CarB

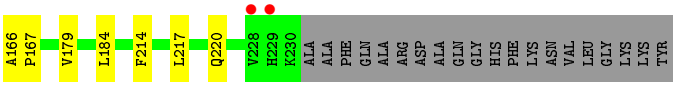
Chain C:



- Molecule 1: CarB

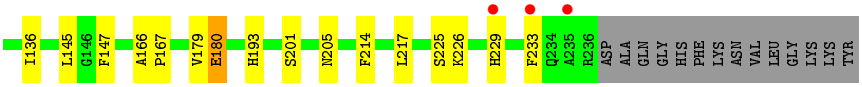
Chain D:





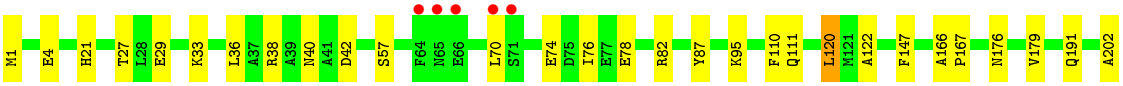
• Molecule 1: CarB

Chain E:



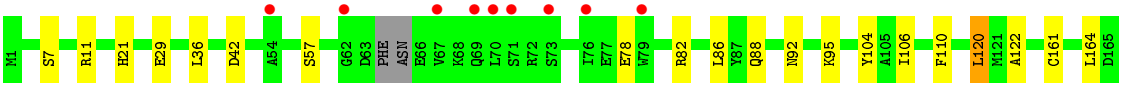
• Molecule 1: CarB

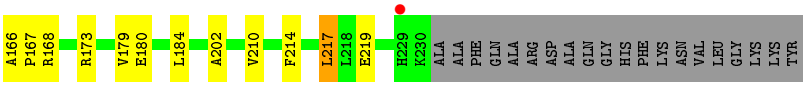
Chain F:



• Molecule 1: CarB

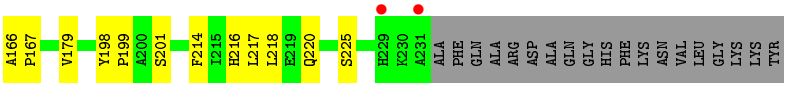
Chain G:





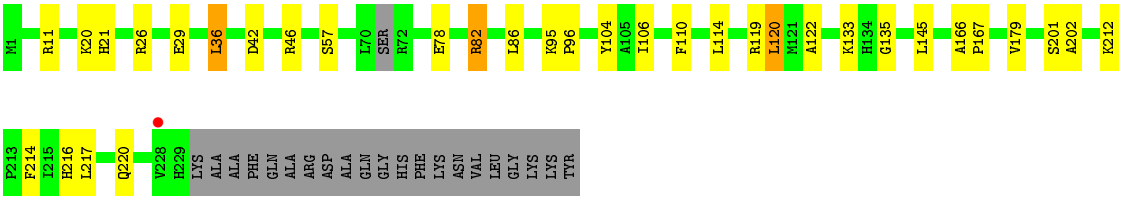
• Molecule 1: CarB

Chain H:



• Molecule 1: CarB

Chain I:


M1
R11
K20
H21
R26
E29
L36
D42
R46
S57
L70
SER
R72
E78
R82
L86
K95
P96
Y104
A105
I106
F110
L114
R119
L120
M121
A122
K133
H134
G135
L145
A166
P167
V179
S201
A202
K212
P213
F214
I215
H216
L217
Q220
V228
H229
LYS
ALA
ALA
PHE
GLN
ALA
ARG
ASP
ALA
GLN
GLY
HIS
PHE
LYS
ASN
VAL
LEU
GLY
LYS
LYS
TYR

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	87.21Å 89.86Å 264.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.60 – 2.24 45.60 – 2.24	Depositor EDS
% Data completeness (in resolution range)	99.7 (45.60-2.24) 99.7 (45.60-2.24)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
$< I/\sigma(I) >$ [1]	5.08 (at 2.24Å)	Xtriage
Refinement program	REFMAC refmac_5.2.0005	Depositor
R, R_{free}	0.185 , 0.238 0.195 , 0.244	Depositor DCC
R_{free} test set	5084 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	29.1	Xtriage
Anisotropy	0.254	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 40.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.019 for k,h,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	16704	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.22% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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	0.74	1/1787 (0.1%)	0.83	7/2421 (0.3%)
1	B	0.78	1/1796 (0.1%)	0.83	5/2434 (0.2%)
1	C	0.76	0/1867	0.83	3/2530 (0.1%)
1	D	0.83	0/1784	0.87	6/2418 (0.2%)
1	E	0.72	0/1832	0.78	2/2486 (0.1%)
1	F	0.73	1/1777 (0.1%)	0.76	0/2408
1	G	0.72	2/1757 (0.1%)	0.80	1/2384 (0.0%)
1	H	0.75	2/1802 (0.1%)	0.80	2/2444 (0.1%)
1	I	0.74	0/1787	0.78	2/2422 (0.1%)
All	All	0.75	7/16189 (0.0%)	0.81	28/21947 (0.1%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	94	ASN	CB-CG	6.45	1.65	1.51
1	G	161	CYS	CB-SG	-6.35	1.71	1.82
1	F	74	GLU	CD-OE2	5.97	1.32	1.25
1	G	92	ASN	CB-CG	5.23	1.63	1.51
1	H	161	CYS	CB-SG	-5.21	1.73	1.81
1	H	138	CYS	CB-SG	-5.12	1.73	1.81
1	A	118	GLN	CG-CD	5.00	1.62	1.51

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	11	ARG	NE-CZ-NH2	-9.06	115.77	120.30
1	A	42	ASP	CB-CG-OD1	6.68	124.31	118.30
1	E	11	ARG	NE-CZ-NH2	-6.63	116.98	120.30
1	H	120	LEU	CA-CB-CG	6.34	129.87	115.30
1	A	82	ARG	NE-CZ-NH1	6.29	123.45	120.30
1	D	119	ARG	NE-CZ-NH2	-6.21	117.19	120.30
1	D	119	ARG	NE-CZ-NH1	6.17	123.38	120.30
1	C	11	ARG	NE-CZ-NH2	-5.99	117.30	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	120	LEU	CA-CB-CG	5.97	129.03	115.30
1	A	11	ARG	NE-CZ-NH2	-5.90	117.35	120.30
1	B	82	ARG	NE-CZ-NH1	5.85	123.22	120.30
1	G	120	LEU	CA-CB-CG	5.73	128.48	115.30
1	A	119	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	A	119	ARG	NE-CZ-NH1	5.65	123.12	120.30
1	B	208	ARG	NE-CZ-NH2	-5.57	117.51	120.30
1	B	120	LEU	CA-CB-CG	5.55	128.07	115.30
1	B	208	ARG	NE-CZ-NH1	5.41	123.00	120.30
1	C	11	ARG	NE-CZ-NH1	5.39	123.00	120.30
1	I	82	ARG	NE-CZ-NH1	5.38	122.99	120.30
1	D	11	ARG	NE-CZ-NH1	5.32	122.96	120.30
1	C	145	LEU	CB-CG-CD2	-5.31	101.97	111.00
1	D	46	ARG	NE-CZ-NH1	5.31	122.95	120.30
1	H	145	LEU	CA-CB-CG	5.27	127.43	115.30
1	A	11	ARG	NE-CZ-NH1	5.19	122.89	120.30
1	E	11	ARG	NE-CZ-NH1	5.18	122.89	120.30
1	B	145	LEU	CB-CG-CD2	-5.05	102.41	111.00
1	I	36	LEU	CA-CB-CG	5.03	126.86	115.30
1	D	120	LEU	CA-CB-CG	5.01	126.83	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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	1756	0	1710	22	0
1	B	1764	0	1724	25	0
1	C	1833	0	1793	16	0
1	D	1752	0	1707	25	0
1	E	1798	0	1747	25	0
1	F	1745	0	1710	17	0
1	G	1726	0	1677	14	0
1	H	1769	0	1727	23	0
1	I	1755	0	1716	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	82	0	0	2	0
2	B	102	0	0	3	0
2	C	96	0	0	1	0
2	D	117	0	0	3	0
2	E	80	0	0	0	0
2	F	83	0	0	0	0
2	G	77	0	0	2	0
2	H	80	0	0	4	0
2	I	89	0	0	2	0
All	All	16704	0	15511	173	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 6.

All (173) 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:H:46:ARG:HG2	1:H:46:ARG:HH11	1.32	0.94
1:D:17:HIS:HD2	1:D:19:ASN:H	1.14	0.93
1:A:6:ASN:HD21	1:A:11:ARG:HH11	1.17	0.92
1:B:6:ASN:HD21	1:B:11:ARG:HE	1.25	0.84
1:F:4:GLU:OE2	1:F:38:ARG:NH2	2.11	0.84
1:E:225:SER:O	1:E:229:HIS:HD2	1.65	0.79
1:B:29:GLU:OE1	1:B:82:ARG:HD2	1.83	0.77
1:A:42:ASP:O	1:A:95:LYS:NZ	2.19	0.75
1:D:17:HIS:CD2	1:D:19:ASN:H	2.03	0.73
1:F:29:GLU:OE1	1:F:82:ARG:HD2	1.89	0.72
1:D:156:GLU:HG3	1:F:176:ASN:HD22	1.54	0.72
1:H:29:GLU:OE1	1:H:82:ARG:HD2	1.89	0.72
1:I:20:LYS:HD2	2:I:328:HOH:O	1.92	0.69
1:C:29:GLU:OE1	1:C:82:ARG:HD2	1.95	0.67
1:I:29:GLU:OE2	1:I:82:ARG:NH1	2.27	0.67
1:H:46:ARG:CG	1:H:46:ARG:HH11	2.07	0.66
1:E:225:SER:O	1:E:229:HIS:CD2	2.49	0.65
1:B:6:ASN:ND2	1:B:11:ARG:HE	1.92	0.65
1:I:166:ALA:HB3	1:I:167:PRO:HD3	1.80	0.63
1:E:42:ASP:O	1:E:95:LYS:NZ	2.32	0.62
1:D:94:ASN:ND2	2:D:328:HOH:O	2.32	0.62
1:F:1:MET:HG3	1:F:27:THR:HG22	1.82	0.61
1:H:216:HIS:HB3	2:H:292:HOH:O	2.00	0.61
1:C:42:ASP:O	1:C:95:LYS:NZ	2.34	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:42:ASP:O	1:I:95:LYS:NZ	2.34	0.61
1:G:29:GLU:OE1	1:G:82:ARG:HD2	2.02	0.60
1:E:9:GLU:OE2	1:E:193:HIS:ND1	2.30	0.60
1:E:114:LEU:HD11	1:E:145:LEU:HD13	1.84	0.60
1:B:70:LEU:HB3	1:B:76:ILE:CD1	2.32	0.59
1:H:76:ILE:O	1:H:80:ILE:HG12	2.01	0.59
1:A:74:GLU:OE1	1:A:74:GLU:N	2.31	0.59
1:D:74:GLU:O	1:D:78:GLU:HG3	2.02	0.59
1:C:84:ILE:O	1:C:88:GLN:HG2	2.03	0.59
1:D:17:HIS:CD2	1:D:18:PRO:HD2	2.38	0.58
1:A:11:ARG:NH2	2:A:319:HOH:O	2.37	0.57
1:G:88:GLN:NE2	1:G:219:GLU:OE2	2.33	0.57
1:G:42:ASP:O	1:G:95:LYS:NZ	2.38	0.57
1:B:166:ALA:HB3	1:B:167:PRO:HD3	1.86	0.57
1:D:21:HIS:HA	1:D:57:SER:HB2	1.87	0.56
1:D:156:GLU:HG3	1:F:176:ASN:ND2	2.20	0.56
1:F:21:HIS:HA	1:F:57:SER:HB2	1.88	0.56
1:H:147:PHE:HB2	1:H:217:LEU:HD22	1.87	0.55
1:A:166:ALA:HB3	1:A:167:PRO:HD3	1.88	0.55
1:D:74:GLU:O	1:D:78:GLU:CG	2.56	0.54
1:C:11:ARG:NH2	2:C:330:HOH:O	2.40	0.54
1:A:87:TYR:OH	1:A:111:GLN:NE2	2.41	0.54
1:E:147:PHE:HB2	1:E:217:LEU:HD22	1.90	0.54
1:E:73:SER:HB3	1:E:233:PHE:CD2	2.43	0.54
1:H:220:GLN:NE2	2:H:292:HOH:O	2.39	0.53
1:F:87:TYR:OH	1:F:111:GLN:NE2	2.42	0.53
1:E:84:ILE:O	1:E:88:GLN:HG2	2.09	0.53
1:B:114:LEU:HD11	1:B:145:LEU:HD13	1.91	0.52
1:A:6:ASN:HD21	1:A:11:ARG:NH1	1.98	0.52
1:C:230:LYS:O	1:C:234:GLN:HG3	2.10	0.52
1:I:216:HIS:CD2	1:I:220:GLN:NE2	2.78	0.52
1:H:46:ARG:NH1	1:H:46:ARG:HG2	2.12	0.51
1:G:202:ALA:HB3	2:H:270:HOH:O	2.11	0.51
1:B:65:ASN:OD1	1:B:65:ASN:N	2.43	0.51
1:E:166:ALA:HB3	1:E:167:PRO:HD3	1.93	0.51
1:E:201:SER:O	1:E:205:ASN:ND2	2.43	0.51
1:E:20:LYS:H	1:E:20:LYS:CD	2.22	0.51
1:D:17:HIS:HD2	1:D:19:ASN:N	1.95	0.50
1:D:217:LEU:HA	1:D:220:GLN:HE21	1.76	0.50
1:E:29:GLU:OE1	1:E:82:ARG:HD2	2.12	0.50
1:F:120:LEU:HD23	1:F:120:LEU:N	2.26	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:70:LEU:HB3	1:F:76:ILE:HD13	1.93	0.50
1:C:179:VAL:HG21	1:C:184:LEU:HA	1.93	0.50
1:E:68:LYS:HE2	1:E:136:ILE:HD11	1.94	0.50
1:I:120:LEU:HD23	1:I:120:LEU:N	2.25	0.50
1:D:98:ILE:HD13	1:D:118:GLN:HB2	1.93	0.50
1:A:79:TRP:O	1:A:83:VAL:HG23	2.12	0.49
1:D:119:ARG:NH2	2:D:348:HOH:O	2.41	0.49
1:G:166:ALA:HB3	1:G:167:PRO:HD3	1.94	0.49
1:F:42:ASP:O	1:F:95:LYS:NZ	2.45	0.49
1:B:173:ARG:NH2	1:C:171:ASP:OD2	2.44	0.49
1:H:46:ARG:NH1	1:H:46:ARG:CG	2.71	0.48
1:I:114:LEU:HD11	1:I:145:LEU:HD13	1.95	0.48
1:A:46:ARG:NH1	1:A:200:ALA:HB2	2.28	0.48
1:G:122:ALA:HA	1:G:179:VAL:O	2.13	0.48
1:H:198:TYR:CD1	1:I:133:LYS:HA	2.49	0.48
1:C:120:LEU:HD23	1:C:120:LEU:N	2.29	0.47
1:E:21:HIS:HA	1:E:57:SER:HB2	1.96	0.47
1:A:88:GLN:NE2	1:A:219:GLU:OE1	2.47	0.47
1:F:122:ALA:HA	1:F:179:VAL:O	2.15	0.47
1:D:122:ALA:HA	1:D:179:VAL:O	2.14	0.47
1:F:27:THR:HG21	2:I:312:HOH:O	2.13	0.47
1:H:155:GLN:NE2	2:H:290:HOH:O	2.45	0.47
1:H:42:ASP:O	1:H:95:LYS:NZ	2.48	0.47
1:B:94:ASN:HA	2:B:321:HOH:O	2.15	0.47
1:F:166:ALA:HB3	1:F:167:PRO:HD3	1.97	0.47
1:G:173:ARG:HG3	2:G:285:HOH:O	2.15	0.47
1:A:118:GLN:NE2	2:A:320:HOH:O	2.47	0.46
1:H:63:ASP:HB3	1:H:66:GLU:HB3	1.97	0.46
1:C:166:ALA:HB3	1:C:167:PRO:HD3	1.97	0.46
1:C:6:ASN:OD1	1:C:11:ARG:HD3	2.16	0.46
1:D:179:VAL:HG21	1:D:184:LEU:HA	1.96	0.46
1:E:72:ARG:O	1:E:75:ASP:HB2	2.15	0.46
1:D:74:GLU:H	1:D:74:GLU:CD	2.18	0.46
1:H:166:ALA:HB3	1:H:167:PRO:HD3	1.96	0.46
1:D:120:LEU:N	1:D:120:LEU:HD23	2.31	0.46
1:D:20:LYS:NZ	1:D:21:HIS:NE2	2.61	0.46
1:A:229:HIS:O	1:A:230:LYS:CB	2.65	0.45
1:A:29:GLU:OE2	1:A:82:ARG:NH1	2.48	0.45
1:B:21:HIS:HA	1:B:57:SER:HB2	1.98	0.45
1:G:217:LEU:O	1:G:217:LEU:HG	2.15	0.45
1:I:21:HIS:HA	1:I:57:SER:HB2	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:70:LEU:HD13	1:A:76:ILE:HA	1.97	0.45
1:G:179:VAL:HG21	1:G:184:LEU:HA	1.96	0.45
1:A:199:PRO:HG2	1:B:135:GLY:HA3	1.98	0.45
1:H:91:LEU:HD12	1:H:218:LEU:HD12	1.99	0.45
1:B:67:VAL:HA	1:B:70:LEU:HB2	1.99	0.45
1:C:64:PHE:CD1	1:C:136:ILE:HG13	2.51	0.45
1:G:179:VAL:CG2	1:G:184:LEU:HA	2.47	0.45
1:B:46:ARG:O	1:B:96:PRO:HD2	2.16	0.45
1:B:76:ILE:O	1:B:80:ILE:HG12	2.17	0.45
1:D:217:LEU:HG	1:D:217:LEU:O	2.14	0.44
1:H:6:ASN:OD1	1:H:11:ARG:NH1	2.48	0.44
1:I:104:TYR:HB3	1:I:106:ILE:HG13	1.98	0.44
1:D:42:ASP:O	1:D:95:LYS:NZ	2.51	0.44
1:B:70:LEU:HB3	1:B:76:ILE:HD13	2.00	0.44
1:C:217:LEU:O	1:C:217:LEU:HG	2.08	0.44
1:D:63:ASP:O	1:D:67:VAL:HG23	2.18	0.44
1:H:199:PRO:HG2	1:I:135:GLY:HA3	2.00	0.44
1:B:122:ALA:HA	1:B:179:VAL:O	2.18	0.44
1:E:217:LEU:O	1:E:217:LEU:HG	2.08	0.44
1:H:122:ALA:HA	1:H:179:VAL:O	2.18	0.44
1:C:22:ASN:N	1:C:23:PRO:CD	2.81	0.43
1:A:29:GLU:OE1	1:A:82:ARG:HD2	2.17	0.43
1:E:20:LYS:H	1:E:20:LYS:HD3	1.83	0.43
1:E:122:ALA:HA	1:E:179:VAL:O	2.18	0.43
1:G:21:HIS:HA	1:G:57:SER:HB2	2.00	0.43
1:B:70:LEU:HD22	1:B:75:ASP:HB3	2.00	0.43
1:E:104:TYR:HB3	1:E:106:ILE:HG13	2.01	0.43
1:B:186:ASP:OD1	2:B:352:HOH:O	2.21	0.43
1:H:84:ILE:O	1:H:88:GLN:HG2	2.19	0.43
1:A:46:ARG:HH12	1:A:200:ALA:HB2	1.85	0.42
1:A:54:ALA:O	1:A:55:GLU:HB2	2.19	0.42
1:B:186:ASP:HB3	2:B:289:HOH:O	2.19	0.42
1:H:63:ASP:O	1:H:67:VAL:HG23	2.18	0.42
1:F:147:PHE:HB2	1:F:217:LEU:HD22	2.01	0.42
1:I:122:ALA:HA	1:I:179:VAL:O	2.20	0.42
1:I:46:ARG:O	1:I:96:PRO:HD2	2.19	0.42
1:E:120:LEU:HD23	1:E:120:LEU:N	2.34	0.42
2:D:277:HOH:O	1:F:202:ALA:HB3	2.19	0.42
1:F:40:ASN:HA	1:F:95:LYS:HE3	2.02	0.42
1:D:36:LEU:HD21	1:D:90:VAL:HG22	2.02	0.42
1:H:79:TRP:O	1:H:83:VAL:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:29:GLU:O	1:F:33:LYS:HG3	2.20	0.42
1:C:14:THR:HA	1:C:51:TYR:O	2.20	0.42
1:B:199:PRO:HG2	1:C:135:GLY:HA3	2.01	0.42
1:E:78:GLU:O	1:E:82:ARG:HG3	2.20	0.41
1:B:63:ASP:CB	1:B:66:GLU:OE1	2.69	0.41
1:E:73:SER:HB3	1:E:233:PHE:CG	2.55	0.41
1:G:104:TYR:HB3	1:G:106:ILE:HG13	2.03	0.41
1:A:84:ILE:O	1:A:88:GLN:HG2	2.20	0.41
1:B:114:LEU:CD1	1:B:145:LEU:HD13	2.50	0.41
1:D:166:ALA:HB3	1:D:167:PRO:HD3	2.02	0.41
1:A:122:ALA:HA	1:A:179:VAL:O	2.20	0.41
1:C:21:HIS:HB3	1:C:60:ALA:HB2	2.02	0.41
1:B:88:GLN:HA	1:B:88:GLN:OE1	2.21	0.41
1:I:119:ARG:C	1:I:120:LEU:HD23	2.41	0.41
1:D:21:HIS:HB3	1:D:60:ALA:HB2	2.03	0.41
1:H:80:ILE:HD12	1:H:225:SER:OG	2.21	0.41
1:A:21:HIS:HA	1:A:57:SER:HB2	2.03	0.41
1:E:63:ASP:OD2	1:E:66:GLU:N	2.54	0.40
1:E:77:GLU:HG3	1:E:226:LYS:HD3	2.01	0.40
1:G:210:VAL:HG22	1:H:142:ALA:HB1	2.02	0.40
1:B:29:GLU:OE2	1:B:82:ARG:NH1	2.55	0.40
1:E:180:GLU:N	1:E:180:GLU:OE1	2.54	0.40
2:G:268:HOH:O	1:I:202:ALA:HB3	2.21	0.40
1:D:14:THR:HA	1:D:51:TYR:O	2.22	0.40
1:G:164:LEU:HD22	1:G:168:ARG:HG2	2.03	0.40
1:A:199:PRO:HG2	1:B:135:GLY:CA	2.52	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 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	225/250 (90%)	220 (98%)	5 (2%)	0	100	100
1	B	228/250 (91%)	221 (97%)	7 (3%)	0	100	100
1	C	236/250 (94%)	232 (98%)	4 (2%)	0	100	100
1	D	224/250 (90%)	219 (98%)	5 (2%)	0	100	100
1	E	234/250 (94%)	230 (98%)	4 (2%)	0	100	100
1	F	224/250 (90%)	221 (99%)	3 (1%)	0	100	100
1	G	224/250 (90%)	219 (98%)	5 (2%)	0	100	100
1	H	229/250 (92%)	223 (97%)	6 (3%)	0	100	100
1	I	224/250 (90%)	221 (99%)	3 (1%)	0	100	100
All	All	2048/2250 (91%)	2006 (98%)	42 (2%)	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	185/205 (90%)	177 (96%)	8 (4%)	29	31
1	B	186/205 (91%)	177 (95%)	9 (5%)	25	25
1	C	194/205 (95%)	186 (96%)	8 (4%)	30	33
1	D	186/205 (91%)	177 (95%)	9 (5%)	25	25
1	E	188/205 (92%)	175 (93%)	13 (7%)	15	12
1	F	187/205 (91%)	181 (97%)	6 (3%)	39	44
1	G	180/205 (88%)	170 (94%)	10 (6%)	21	19
1	H	188/205 (92%)	176 (94%)	12 (6%)	17	14
1	I	187/205 (91%)	176 (94%)	11 (6%)	19	17
All	All	1681/1845 (91%)	1595 (95%)	86 (5%)	24	23

All (86) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	27	THR
1	A	36	LEU
1	A	86	LEU
1	A	110	PHE
1	A	120	LEU
1	A	214	PHE
1	A	225	SER
1	B	36	LEU
1	B	65	ASN
1	B	67	VAL
1	B	78	GLU
1	B	86	LEU
1	B	110	PHE
1	B	120	LEU
1	B	186	ASP
1	B	214	PHE
1	C	7	SER
1	C	36	LEU
1	C	86	LEU
1	C	110	PHE
1	C	120	LEU
1	C	158	ILE
1	C	208	ARG
1	C	214	PHE
1	D	36	LEU
1	D	46	ARG
1	D	69	GLN
1	D	76	ILE
1	D	86	LEU
1	D	91	LEU
1	D	110	PHE
1	D	120	LEU
1	D	214	PHE
1	E	3	PHE
1	E	11	ARG
1	E	20	LYS
1	E	36	LEU
1	E	43	ASP
1	E	55	GLU
1	E	70	LEU
1	E	77	GLU
1	E	86	LEU

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Mol	Chain	Res	Type
1	E	110	PHE
1	E	120	LEU
1	E	180	GLU
1	E	214	PHE
1	F	36	LEU
1	F	78	GLU
1	F	110	PHE
1	F	120	LEU
1	F	191	GLN
1	F	214	PHE
1	G	7	SER
1	G	11	ARG
1	G	36	LEU
1	G	78	GLU
1	G	86	LEU
1	G	110	PHE
1	G	120	LEU
1	G	180	GLU
1	G	214	PHE
1	G	217	LEU
1	H	1	MET
1	H	36	LEU
1	H	46	ARG
1	H	65	ASN
1	H	66	GLU
1	H	71	SER
1	H	86	LEU
1	H	110	PHE
1	H	120	LEU
1	H	145	LEU
1	H	201	SER
1	H	214	PHE
1	I	11	ARG
1	I	26	ARG
1	I	36	LEU
1	I	78	GLU
1	I	86	LEU
1	I	110	PHE
1	I	120	LEU
1	I	201	SER
1	I	212	LYS
1	I	214	PHE

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Mol	Chain	Res	Type
1	I	217	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	ASN
1	A	111	GLN
1	A	118	GLN
1	B	6	ASN
1	B	160	GLN
1	B	177	GLN
1	C	234	GLN
1	D	17	HIS
1	D	69	GLN
1	D	134	HIS
1	D	177	GLN
1	D	220	GLN
1	E	220	GLN
1	E	229	HIS
1	F	111	GLN
1	F	126	ASN
1	G	229	HIS
1	H	94	ASN
1	H	205	ASN
1	I	65	ASN
1	I	134	HIS
1	I	220	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	229/250 (91%)	-0.12	11 (4%)	30	30	21, 34, 63, 84	0
1	B	230/250 (92%)	-0.03	14 (6%)	21	20	19, 31, 68, 92	0
1	C	238/250 (95%)	-0.18	4 (1%)	70	71	20, 34, 52, 69	1 (0%)
1	D	228/250 (91%)	-0.19	8 (3%)	44	43	19, 30, 58, 78	0
1	E	236/250 (94%)	-0.12	14 (5%)	22	21	21, 36, 66, 82	0
1	F	226/250 (90%)	-0.26	5 (2%)	62	63	23, 38, 55, 72	0
1	G	228/250 (91%)	-0.06	10 (4%)	34	34	21, 39, 65, 96	1 (0%)
1	H	231/250 (92%)	-0.03	7 (3%)	50	50	21, 39, 76, 99	0
1	I	228/250 (91%)	-0.25	1 (0%)	92	93	19, 34, 56, 68	0
All	All	2074/2250 (92%)	-0.14	74 (3%)	42	42	19, 35, 63, 99	2 (0%)

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	71	SER	6.6
1	B	67	VAL	6.1
1	E	70	LEU	5.7
1	G	70	LEU	5.7
1	B	73	SER	5.0
1	A	72	ARG	4.8
1	B	69	GLN	4.7
1	G	73	SER	4.5
1	E	73	SER	4.4
1	B	72	ARG	4.3
1	D	69	GLN	4.2
1	E	69	GLN	4.2
1	H	71	SER	4.2
1	B	64	PHE	4.2
1	D	75	ASP	4.2

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Mol	Chain	Res	Type	RSRZ
1	A	64	PHE	4.0
1	A	73	SER	4.0
1	H	64	PHE	3.9
1	E	71	SER	3.9
1	F	64	PHE	3.8
1	A	74	GLU	3.7
1	B	68	LYS	3.6
1	E	233	PHE	3.5
1	D	74	GLU	3.5
1	E	67	VAL	3.5
1	D	229	HIS	3.4
1	D	73	SER	3.4
1	D	64	PHE	3.3
1	B	70	LEU	3.2
1	E	64	PHE	3.2
1	A	67	VAL	3.1
1	H	231	ALA	2.9
1	E	75	ASP	2.9
1	C	216	HIS	2.9
1	C	72	ARG	2.9
1	B	71	SER	2.9
1	A	65	ASN	2.8
1	E	65	ASN	2.8
1	G	54	ALA	2.8
1	B	65	ASN	2.7
1	A	79	TRP	2.7
1	D	228	VAL	2.7
1	H	75	ASP	2.6
1	H	65	ASN	2.6
1	G	67	VAL	2.6
1	B	229	HIS	2.6
1	F	70	LEU	2.6
1	I	228	VAL	2.6
1	A	69	GLN	2.5
1	C	237	ASP	2.4
1	G	229	HIS	2.4
1	G	69	GLN	2.4
1	H	229	HIS	2.3
1	A	229	HIS	2.3
1	A	70	LEU	2.3
1	F	65	ASN	2.3
1	B	3	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	186	ASP	2.2
1	C	233	PHE	2.2
1	G	62	GLY	2.2
1	D	68	LYS	2.2
1	B	74	GLU	2.2
1	A	68	LYS	2.1
1	E	68	LYS	2.1
1	E	72	ARG	2.1
1	F	66	GLU	2.1
1	F	71	SER	2.1
1	E	76	ILE	2.1
1	G	76	ILE	2.1
1	H	73	SER	2.1
1	B	76	ILE	2.1
1	E	229	HIS	2.1
1	G	79	TRP	2.0
1	E	235	ALA	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

There are no carbohydrates in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.