Full wwPDB X-ray Structure Validation Report (i)

Oct 31, 2021 – 11:57 AM EDT

PDB ID	:	2EGK
Title	:	Crystal Structure of Tamalin PDZ-Intrinsic Ligand Fusion Protein
Authors	:	Sugi, T.; Oyama, T.; Muto, T.; Nakanishi, S.; Morikawa, K.; Jingami, H.
Deposited on	:	2007-03-01
Resolution	:	2.85 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 (i) symbol.

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

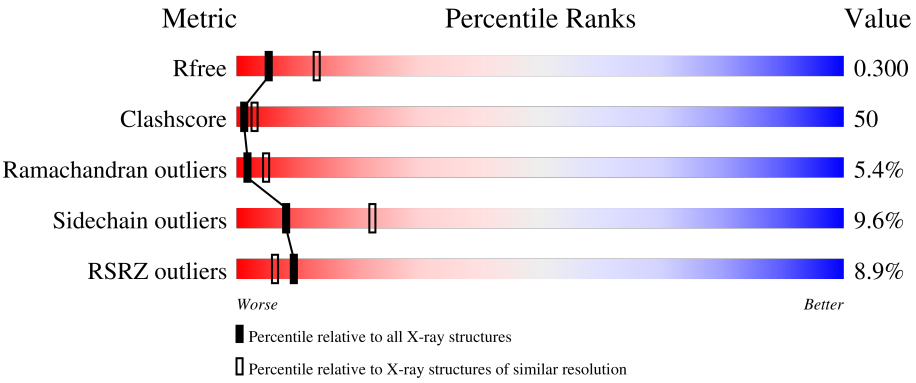
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 2.85 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	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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 of 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	101	10% 28% 50% 10% 12%
1	B	101	2% 48% 35% 7% 11%
1	C	101	49% 31% 7% • 13%
1	D	101	19% 17% 56% 13% 14%

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	PO4	C	195	-	-	X	-

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 2751 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.

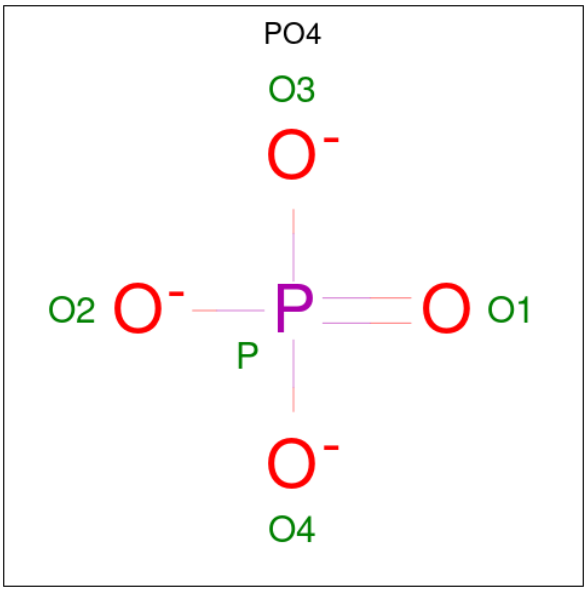
- Molecule 1 is a protein called General receptor for phosphoinositides 1-associated scaffold protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	89	Total	C	N	O	Se	12	0	0
			670	421	113	135	1			
1	B	90	Total	C	N	O	Se	0	0	0
			686	429	123	133	1			
1	C	88	Total	C	N	O	Se	0	0	0
			676	423	120	132	1			
1	D	87	Total	C	N	O	Se	8	0	0
			666	415	117	133	1			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	94	GLY	-	cloning artifact	UNP Q8R4T5
A	95	SER	-	cloning artifact	UNP Q8R4T5
A	130	MSE	MET	modified residue	UNP Q8R4T5
A	135	ALA	CYS	engineered mutation	UNP Q8R4T5
B	94	GLY	-	cloning artifact	UNP Q8R4T5
B	95	SER	-	cloning artifact	UNP Q8R4T5
B	130	MSE	MET	modified residue	UNP Q8R4T5
B	135	ALA	CYS	engineered mutation	UNP Q8R4T5
C	94	GLY	-	cloning artifact	UNP Q8R4T5
C	95	SER	-	cloning artifact	UNP Q8R4T5
C	130	MSE	MET	modified residue	UNP Q8R4T5
C	135	ALA	CYS	engineered mutation	UNP Q8R4T5
D	94	GLY	-	cloning artifact	UNP Q8R4T5
D	95	SER	-	cloning artifact	UNP Q8R4T5
D	130	MSE	MET	modified residue	UNP Q8R4T5
D	135	ALA	CYS	engineered mutation	UNP Q8R4T5

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total O P 5 4 1	0	0
2	C	1	Total O P 5 4 1	0	0

- Molecule 3 is water.

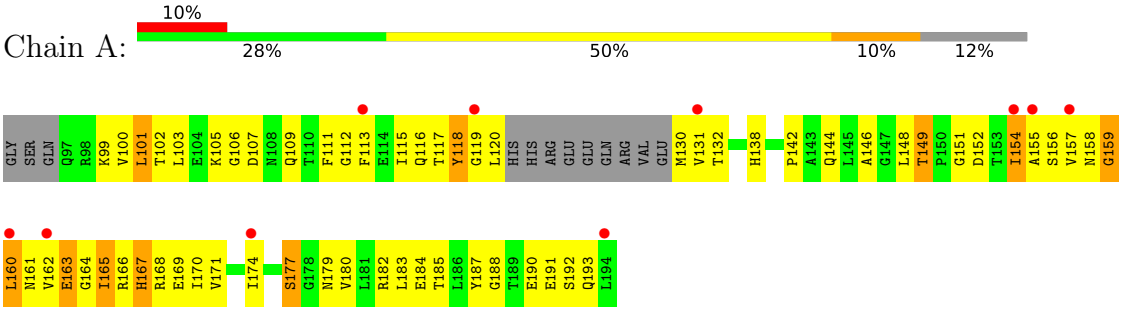
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	7	Total O 7 7	0	0
3	B	17	Total O 17 17	0	0
3	C	13	Total O 13 13	0	0
3	D	6	Total O 6 6	0	0

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 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.

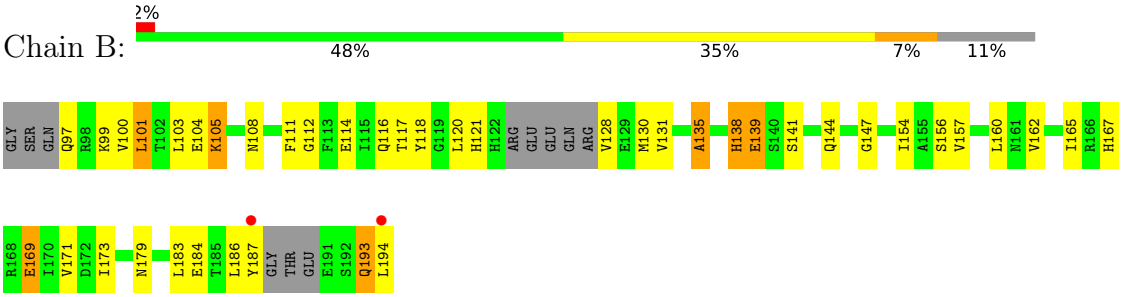
• Molecule 1: General receptor for phosphoinositides 1-associated scaffold protein

Chain A:



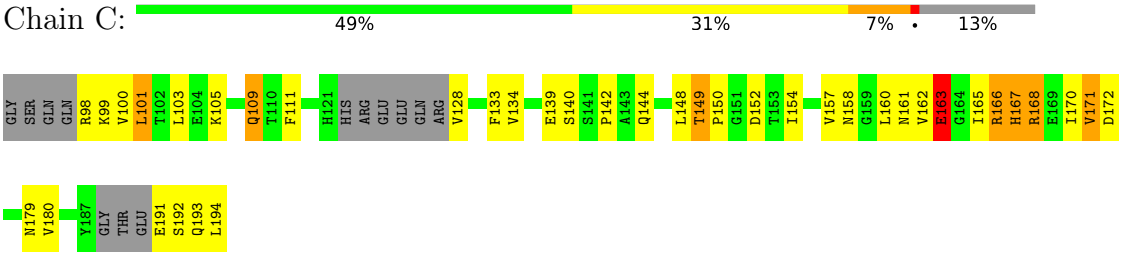
• Molecule 1: General receptor for phosphoinositides 1-associated scaffold protein

Chain B:



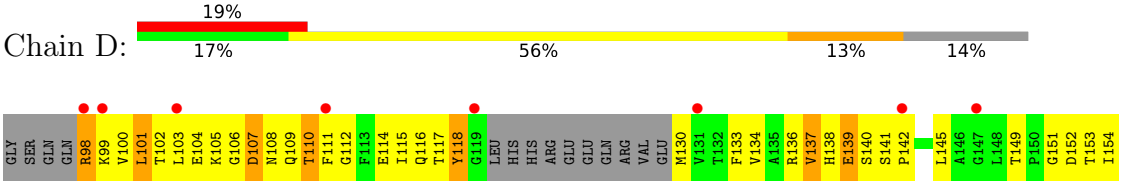
• Molecule 1: General receptor for phosphoinositides 1-associated scaffold protein

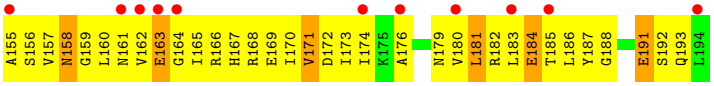
Chain C:



• Molecule 1: General receptor for phosphoinositides 1-associated scaffold protein

Chain D:




A155
S156
V157
N158
G159
L160
N161
V162
E163
G164
I165
R166
H167
R168
E169
I170
V171
D172
I173
I174
K175
A176
N179
V180
L181
R182
L183
E184
T185
L186
Y187
G188
E191
S192
Q193
L194

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	48.56Å 114.07Å 125.74Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.85 45.30 – 2.87	Depositor EDS
% Data completeness (in resolution range)	97.2 (50.00-2.85) 95.1 (45.30-2.87)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.58 (at 2.86Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.269 , 0.291 0.278 , 0.300	Depositor DCC
R_{free} test set	1478 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å^2)	39.2	Xtriage
Anisotropy	0.469	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 61.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.87	EDS
Total number of atoms	2751	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.81% 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

Bond lengths and bond angles in the following residue types are not validated in this section: PO4

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	0.54	0/677	0.80	0/915
1	B	0.53	1/691 (0.1%)	0.76	0/929
1	C	0.44	0/681	0.73	0/915
1	D	0.59	0/673	0.84	0/907
All	All	0.53	1/2722 (0.0%)	0.78	0/3666

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	193	GLN	CD-OE1	5.11	1.35	1.24

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	A	670	0	661	90	0
1	B	686	0	685	44	0
1	C	676	0	679	49	0
1	D	666	0	661	106	0
2	B	5	0	0	0	0
2	C	5	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	7	0	0	4	0
3	B	17	0	0	3	0
3	C	13	0	0	0	0
3	D	6	0	0	9	0
All	All	2751	0	2686	267	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 50.

All (267) 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:D:157:VAL:HG23	3:D:16:HOH:O	1.10	1.23
1:D:170:ILE:HA	1:D:173:ILE:HD12	1.31	1.12
1:A:107:ASP:HA	1:A:179:ASN:HD21	1.04	1.11
1:C:101:LEU:HD23	1:C:101:LEU:H	1.10	1.10
1:B:139:GLU:HG2	3:B:9:HOH:O	1.55	1.05
1:D:109:GLN:HA	3:D:24:HOH:O	1.58	1.04
1:A:166:ARG:HH11	1:A:168:ARG:H	1.05	1.02
1:C:166:ARG:HB2	1:C:166:ARG:HH11	1.25	1.00
1:A:177:SER:O	3:A:14:HOH:O	1.78	1.00
1:D:156:SER:HB3	1:D:184:GLU:HB2	1.40	1.00
1:D:162:VAL:HG13	3:D:16:HOH:O	1.62	0.99
1:B:139:GLU:CG	3:B:9:HOH:O	2.09	0.98
1:D:158:ASN:HA	1:D:182:ARG:HB3	1.46	0.98
1:A:107:ASP:HA	1:A:179:ASN:ND2	1.79	0.97
1:D:112:GLY:HA3	1:D:141:SER:HB2	1.47	0.96
1:D:158:ASN:ND2	1:D:182:ARG:H	1.66	0.94
1:D:136:ARG:HG2	1:D:137:VAL:H	1.32	0.94
1:D:161:ASN:HB3	1:D:163:GLU:OE1	1.68	0.94
1:A:174:ILE:HG21	1:B:194:LEU:HD13	1.50	0.93
1:D:156:SER:HB3	1:D:184:GLU:CB	1.99	0.93
1:D:158:ASN:HD22	1:D:182:ARG:HB3	1.31	0.93
1:A:162:VAL:HB	1:A:170:ILE:HD13	1.56	0.86
1:D:136:ARG:HG2	1:D:137:VAL:N	1.87	0.86
1:C:101:LEU:HD23	1:C:101:LEU:N	1.91	0.86
1:C:166:ARG:HB2	1:C:166:ARG:NH1	1.92	0.85
1:D:107:ASP:HA	1:D:179:ASN:ND2	1.93	0.82
1:A:144:GLN:HE22	1:C:139:GLU:HB2	1.45	0.82
1:B:105:LYS:O	1:B:179:ASN:HB3	1.80	0.81
1:A:111:PHE:O	1:A:142:PRO:HD2	1.82	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:156:SER:HB3	1:B:184:GLU:HB2	1.63	0.79
1:D:107:ASP:HA	1:D:179:ASN:HD21	1.45	0.78
1:D:99:LYS:NZ	1:D:187:TYR:HB2	1.99	0.78
1:A:99:LYS:HZ1	1:A:187:TYR:CA	1.97	0.77
1:A:154:ILE:HD12	1:A:154:ILE:H	1.50	0.77
1:A:99:LYS:HZ1	1:A:187:TYR:N	1.84	0.76
1:D:151:GLY:O	1:D:188:GLY:HA3	1.86	0.76
1:C:191:GLU:HG2	1:D:116:GLN:HE21	1.48	0.76
1:A:156:SER:HB3	1:A:161:ASN:HA	1.68	0.76
1:D:154:ILE:HD12	1:D:183:LEU:HD22	1.69	0.75
1:A:151:GLY:O	1:A:188:GLY:HA3	1.87	0.75
1:D:109:GLN:CA	3:D:24:HOH:O	2.19	0.74
1:D:167:HIS:O	1:D:171:VAL:HG12	1.88	0.74
1:B:97:GLN:HG2	1:B:187:TYR:H	1.53	0.73
1:D:170:ILE:O	1:D:174:ILE:HG13	1.88	0.73
1:A:165:ILE:HB	1:A:170:ILE:HD11	1.72	0.71
1:A:154:ILE:HD12	1:A:154:ILE:N	2.05	0.71
1:D:158:ASN:HD21	1:D:182:ARG:H	1.38	0.71
1:D:101:LEU:HD12	1:D:183:LEU:O	1.90	0.71
1:D:103:LEU:HD13	1:D:183:LEU:HD12	1.72	0.70
1:D:101:LEU:HD11	1:D:185:THR:HG23	1.72	0.70
1:A:111:PHE:HB2	1:B:194:LEU:OXT	1.91	0.69
1:B:121:HIS:CE1	1:B:128:VAL:HG22	2.28	0.69
1:B:193:GLN:O	1:B:194:LEU:HD23	1.93	0.69
1:A:106:GLY:HA3	1:A:109:GLN:HE21	1.58	0.69
1:D:99:LYS:HZ2	1:D:187:TYR:HB2	1.57	0.68
1:C:101:LEU:H	1:C:101:LEU:CD2	1.91	0.68
1:C:168:ARG:HE	2:C:195:PO4:P	2.17	0.68
1:A:156:SER:HB3	1:A:161:ASN:ND2	2.09	0.67
1:D:156:SER:CB	1:D:184:GLU:HB2	2.20	0.66
1:D:163:GLU:H	1:D:163:GLU:CD	1.99	0.66
1:A:118:TYR:N	1:A:131:VAL:O	2.28	0.65
1:D:166:ARG:O	1:D:170:ILE:HG13	1.95	0.65
1:C:191:GLU:CG	1:D:116:GLN:HE21	2.09	0.65
1:C:193:GLN:C	1:C:194:LEU:HD12	2.18	0.65
1:D:102:THR:HA	1:D:181:LEU:O	1.97	0.64
1:A:192:SER:O	3:A:3:HOH:O	2.14	0.64
1:C:191:GLU:CB	1:D:116:GLN:HG3	2.28	0.64
1:D:130:MSE:HB3	1:D:164:GLY:HA2	1.79	0.64
1:C:105:LYS:HG2	1:C:111:PHE:CE1	2.33	0.64
1:D:153:THR:HB	1:D:186:LEU:HB2	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:145:LEU:N	1:D:145:LEU:HD23	2.11	0.63
1:A:105:LYS:HG2	1:A:179:ASN:HA	1.80	0.63
1:D:161:ASN:HB3	1:D:163:GLU:CD	2.19	0.63
1:D:158:ASN:ND2	1:D:182:ARG:HB3	2.10	0.62
1:D:111:PHE:O	1:D:142:PRO:HD2	1.99	0.62
1:A:102:THR:HG22	1:A:182:ARG:HG3	1.81	0.62
1:A:166:ARG:HH11	1:A:168:ARG:N	1.89	0.62
1:D:158:ASN:HD22	1:D:182:ARG:CB	2.10	0.62
1:A:117:THR:HG23	1:A:132:THR:OG1	2.00	0.62
1:A:166:ARG:NH1	1:A:168:ARG:H	1.89	0.61
1:D:101:LEU:HD11	1:D:185:THR:CG2	2.31	0.61
1:B:108:ASN:N	1:B:108:ASN:HD22	1.99	0.61
1:C:157:VAL:HG23	1:C:162:VAL:HG11	1.83	0.61
1:D:155:ALA:O	1:D:162:VAL:HG22	2.00	0.61
1:A:99:LYS:NZ	1:A:187:TYR:N	2.48	0.61
1:C:166:ARG:HE	1:C:168:ARG:HB2	1.66	0.60
1:D:109:GLN:CB	3:D:24:HOH:O	2.46	0.60
1:D:157:VAL:CG2	3:D:16:HOH:O	1.91	0.60
1:A:156:SER:CB	1:A:161:ASN:HA	2.31	0.60
1:A:166:ARG:HD3	1:A:167:HIS:N	2.16	0.60
1:D:99:LYS:HB2	3:D:5:HOH:O	2.01	0.59
1:D:154:ILE:HD12	1:D:183:LEU:CD2	2.32	0.59
1:D:105:LYS:HG3	1:D:179:ASN:OD1	2.02	0.59
1:A:165:ILE:HB	1:A:170:ILE:CG1	2.32	0.59
1:C:193:GLN:O	1:C:194:LEU:HD12	2.02	0.59
1:A:158:ASN:O	1:A:160:LEU:N	2.36	0.58
1:D:109:GLN:HB2	3:D:24:HOH:O	2.03	0.58
1:D:157:VAL:O	1:D:159:GLY:N	2.35	0.58
1:D:157:VAL:O	1:D:160:LEU:HD23	2.02	0.58
1:A:149:THR:HB	1:A:152:ASP:OD2	2.04	0.58
1:D:169:GLU:O	1:D:173:ILE:HG13	2.04	0.58
1:D:158:ASN:C	1:D:182:ARG:HD2	2.24	0.58
1:A:100:VAL:HG12	1:A:101:LEU:N	2.19	0.58
1:A:118:TYR:O	1:A:131:VAL:HG12	2.04	0.58
1:A:106:GLY:H	1:A:109:GLN:CG	2.18	0.57
1:A:156:SER:HB3	1:A:161:ASN:HD22	1.69	0.57
1:A:156:SER:CB	1:A:161:ASN:HD22	2.17	0.57
1:C:139:GLU:HA	1:C:144:GLN:OE1	2.04	0.57
1:A:165:ILE:HB	1:A:170:ILE:CD1	2.33	0.57
1:B:117:THR:CG2	1:B:130:MSE:HE3	2.35	0.57
1:A:115:ILE:HD12	1:A:132:THR:HG21	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:165:ILE:HG22	1:A:166:ARG:N	2.19	0.57
1:A:167:HIS:O	1:A:171:VAL:HG23	2.05	0.57
1:B:97:GLN:HG2	1:B:187:TYR:N	2.19	0.57
1:B:112:GLY:HA3	1:B:141:SER:HB2	1.85	0.57
1:D:166:ARG:NE	1:D:169:GLU:HB2	2.20	0.57
1:D:156:SER:HB3	1:D:184:GLU:HB3	1.83	0.57
1:A:106:GLY:CA	1:A:109:GLN:HE21	2.18	0.56
1:A:162:VAL:HA	1:A:165:ILE:HD12	1.87	0.56
1:D:157:VAL:C	1:D:159:GLY:N	2.59	0.56
1:D:158:ASN:HD22	1:D:182:ARG:H	1.54	0.55
1:C:158:ASN:O	1:C:160:LEU:HG	2.07	0.55
1:C:161:ASN:OD1	1:C:163:GLU:HB2	2.06	0.54
1:A:99:LYS:NZ	1:A:187:TYR:HB2	2.22	0.54
1:A:106:GLY:H	1:A:109:GLN:NE2	2.05	0.54
1:A:106:GLY:H	1:A:109:GLN:CD	2.11	0.54
1:A:106:GLY:CA	1:A:109:GLN:HG2	2.38	0.54
1:B:157:VAL:HG22	1:B:183:LEU:HD23	1.89	0.54
1:B:138:HIS:ND1	1:B:138:HIS:N	2.56	0.53
1:C:191:GLU:HB2	1:D:116:GLN:HG3	1.90	0.53
1:B:154:ILE:HG22	1:B:162:VAL:HG21	1.89	0.53
1:A:100:VAL:HA	1:A:184:GLU:HA	1.90	0.53
1:A:156:SER:CB	1:A:161:ASN:ND2	2.72	0.53
1:A:112:GLY:O	1:A:138:HIS:HD2	1.91	0.53
1:A:116:GLN:C	1:A:132:THR:HG23	2.29	0.53
1:D:130:MSE:HE3	1:D:130:MSE:C	2.29	0.52
1:C:105:LYS:HE3	1:C:179:ASN:HA	1.91	0.52
1:A:103:LEU:N	1:A:103:LEU:HD12	2.25	0.52
1:A:144:GLN:NE2	1:C:139:GLU:HB2	2.22	0.52
1:A:112:GLY:O	1:A:138:HIS:CD2	2.61	0.52
1:D:100:VAL:HG22	1:D:184:GLU:HG3	1.92	0.52
1:B:138:HIS:HA	1:D:139:GLU:OE2	2.10	0.52
1:A:105:LYS:HG3	1:A:106:GLY:O	2.10	0.51
1:D:99:LYS:HG3	1:D:185:THR:OG1	2.11	0.51
1:D:158:ASN:ND2	1:D:182:ARG:N	2.48	0.51
1:D:173:ILE:O	1:D:176:ALA:HB3	2.10	0.51
1:C:128:VAL:HG13	1:C:128:VAL:O	2.09	0.51
1:B:144:GLN:O	1:B:147:GLY:N	2.39	0.51
1:C:191:GLU:HA	1:D:116:GLN:HG3	1.94	0.51
1:D:133:PHE:HD1	1:D:134:VAL:O	1.95	0.50
1:A:180:VAL:O	3:A:14:HOH:O	2.20	0.50
1:B:160:LEU:HD12	1:B:173:ILE:CG2	2.42	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:160:LEU:HD12	1:B:173:ILE:HG21	1.93	0.50
1:D:162:VAL:O	1:D:164:GLY:N	2.44	0.50
1:B:117:THR:HG21	1:B:130:MSE:HE3	1.94	0.50
1:C:105:LYS:O	1:C:179:ASN:HB3	2.12	0.50
1:A:118:TYR:O	1:A:131:VAL:N	2.45	0.49
1:B:165:ILE:HG23	1:B:169:GLU:HB3	1.93	0.49
1:C:103:LEU:HD23	1:C:111:PHE:HB3	1.93	0.49
1:A:165:ILE:CG2	1:A:166:ARG:N	2.76	0.49
1:A:101:LEU:HD12	1:A:146:ALA:O	2.12	0.49
1:A:154:ILE:HA	1:A:185:THR:HG22	1.95	0.49
1:B:108:ASN:N	1:B:108:ASN:ND2	2.60	0.49
1:D:185:THR:C	1:D:186:LEU:HD12	2.33	0.49
1:A:157:VAL:HG12	1:A:158:ASN:ND2	2.28	0.49
1:A:165:ILE:CG2	1:A:169:GLU:HB3	2.43	0.49
1:A:99:LYS:HZ1	1:A:187:TYR:CB	2.25	0.48
1:B:167:HIS:O	1:B:171:VAL:HG23	2.13	0.48
1:B:120:LEU:O	1:B:128:VAL:HA	2.13	0.48
1:C:166:ARG:NH2	1:C:167:HIS:HB3	2.28	0.48
1:D:99:LYS:HZ1	1:D:187:TYR:HB2	1.79	0.48
1:D:138:HIS:O	1:D:141:SER:HB3	2.13	0.48
1:A:166:ARG:NH1	1:A:168:ARG:CB	2.76	0.48
1:B:99:LYS:O	1:B:101:LEU:HD12	2.14	0.48
1:D:191:GLU:C	1:D:193:GLN:H	2.17	0.48
1:A:116:GLN:O	1:A:132:THR:HA	2.14	0.48
1:C:191:GLU:CA	1:D:116:GLN:HG3	2.43	0.48
1:D:117:THR:HG22	1:D:118:TYR:N	2.29	0.48
1:A:100:VAL:HG22	1:A:184:GLU:HG2	1.96	0.47
1:A:102:THR:HG22	1:A:182:ARG:HA	1.96	0.47
1:B:103:LEU:CD2	1:B:111:PHE:HB3	2.43	0.47
1:B:169:GLU:O	1:B:173:ILE:HG13	2.14	0.47
1:D:139:GLU:O	1:D:141:SER:N	2.47	0.47
1:C:105:LYS:HE3	1:C:179:ASN:OD1	2.13	0.47
1:A:106:GLY:N	1:A:109:GLN:NE2	2.62	0.47
1:D:149:THR:O	1:D:152:ASP:OD2	2.33	0.47
1:C:191:GLU:HG2	1:D:114:GLU:OE2	2.15	0.47
1:A:99:LYS:HZ1	1:A:187:TYR:HB2	1.80	0.47
1:B:114:GLU:O	1:B:135:ALA:N	2.44	0.47
1:D:151:GLY:C	1:D:188:GLY:HA3	2.36	0.47
1:C:194:LEU:HD13	1:D:115:ILE:HG12	1.96	0.46
1:D:157:VAL:O	1:D:158:ASN:C	2.52	0.46
1:C:162:VAL:HB	1:C:170:ILE:HD11	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:166:ARG:CZ	1:D:169:GLU:HB2	2.46	0.46
1:C:171:VAL:CG2	1:C:172:ASP:N	2.77	0.46
1:A:106:GLY:HA3	1:A:109:GLN:HG2	1.98	0.46
1:A:100:VAL:CG1	1:A:101:LEU:N	2.77	0.46
1:A:118:TYR:CE2	1:B:131:VAL:HG11	2.51	0.46
1:C:191:GLU:CG	1:D:116:GLN:NE2	2.76	0.46
1:B:139:GLU:OE1	1:B:139:GLU:HA	2.16	0.46
1:D:100:VAL:HG22	1:D:184:GLU:CG	2.46	0.46
1:A:154:ILE:N	1:A:154:ILE:CD1	2.76	0.46
1:B:169:GLU:HA	1:B:169:GLU:OE1	2.16	0.45
1:B:139:GLU:HG3	3:B:9:HOH:O	1.98	0.45
1:D:166:ARG:HE	1:D:169:GLU:HB2	1.80	0.45
1:B:118:TYR:O	1:B:130:MSE:HA	2.15	0.45
1:C:154:ILE:HG22	1:C:162:VAL:HG21	1.99	0.45
1:A:159:GLY:O	1:A:161:ASN:ND2	2.49	0.45
1:C:149:THR:HA	1:C:150:PRO:HD3	1.85	0.45
1:C:166:ARG:HH22	1:D:191:GLU:CD	2.20	0.45
1:D:106:GLY:O	1:D:109:GLN:HG2	2.17	0.45
1:D:130:MSE:HE2	1:D:165:ILE:O	2.17	0.45
1:C:192:SER:OG	1:D:167:HIS:NE2	2.50	0.44
1:D:104:GLU:HG2	1:D:180:VAL:HG22	2.00	0.44
1:D:165:ILE:CB	1:D:170:ILE:HD11	2.47	0.44
1:A:119:GLY:O	1:A:120:LEU:HG	2.17	0.44
1:B:114:GLU:HG2	1:D:192:SER:O	2.18	0.44
1:C:166:ARG:NH2	2:C:195:PO4:O2	2.49	0.44
1:D:137:VAL:HG12	1:D:137:VAL:O	2.17	0.44
1:A:151:GLY:C	1:A:188:GLY:HA3	2.38	0.44
1:D:153:THR:HG22	1:D:154:ILE:N	2.32	0.44
1:C:101:LEU:N	1:C:101:LEU:CD2	2.62	0.44
1:D:98:ARG:HG3	1:D:99:LYS:H	1.82	0.44
1:D:166:ARG:NH2	1:D:169:GLU:HB2	2.33	0.44
1:B:116:GLN:HA	1:B:116:GLN:NE2	2.31	0.44
1:C:140:SER:N	1:C:144:GLN:OE1	2.48	0.43
1:D:110:THR:N	3:D:24:HOH:O	2.49	0.43
1:A:130:MSE:HB2	1:A:164:GLY:O	2.19	0.43
1:D:169:GLU:O	1:D:172:ASP:HB3	2.17	0.43
1:C:165:ILE:HG22	1:C:166:ARG:N	2.32	0.43
1:A:99:LYS:HZ1	1:A:187:TYR:HA	1.82	0.43
1:C:191:GLU:HA	1:D:116:GLN:HA	2.01	0.43
1:C:105:LYS:HB2	1:C:109:GLN:OE1	2.18	0.43
1:D:159:GLY:N	1:D:182:ARG:HD2	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:156:SER:HB2	1:A:159:GLY:O	2.18	0.43
1:C:133:PHE:HA	1:C:152:ASP:O	2.19	0.42
1:B:154:ILE:HG22	1:B:162:VAL:CG2	2.49	0.42
1:A:101:LEU:HD23	1:A:183:LEU:O	2.20	0.42
1:D:136:ARG:O	1:D:137:VAL:HG23	2.19	0.42
1:A:165:ILE:HB	1:A:170:ILE:HG12	2.01	0.42
1:A:159:GLY:O	1:A:160:LEU:C	2.58	0.42
1:B:117:THR:HG22	1:B:130:MSE:HE3	2.00	0.42
1:C:101:LEU:HD11	1:C:148:LEU:HA	2.02	0.42
1:A:101:LEU:HA	3:A:39:HOH:O	2.19	0.42
1:A:113:PHE:O	1:B:194:LEU:N	2.51	0.42
1:D:98:ARG:NH2	1:D:161:ASN:HD21	2.18	0.42
1:A:155:ALA:HA	1:A:163:GLU:HG3	2.01	0.42
1:A:190:GLU:O	1:A:193:GLN:HG2	2.20	0.42
1:A:103:LEU:HG	1:A:146:ALA:CB	2.50	0.41
1:B:186:LEU:HA	1:B:186:LEU:HD23	1.73	0.41
1:C:162:VAL:HB	1:C:170:ILE:CD1	2.50	0.41
1:D:186:LEU:HD12	1:D:186:LEU:N	2.35	0.41
1:B:103:LEU:HD22	1:B:111:PHE:HB3	2.02	0.41
1:D:168:ARG:O	1:D:171:VAL:HG13	2.21	0.41
1:B:100:VAL:C	1:B:101:LEU:HD12	2.41	0.41
1:B:117:THR:HA	1:B:131:VAL:O	2.20	0.41
1:A:111:PHE:C	1:A:142:PRO:HD2	2.41	0.41
1:A:148:LEU:HD23	1:A:148:LEU:HA	1.89	0.41
1:B:105:LYS:HG3	1:B:111:PHE:CE1	2.56	0.41
1:C:134:VAL:HG21	1:C:148:LEU:HD11	2.02	0.41
1:C:191:GLU:N	1:D:167:HIS:CE1	2.89	0.41
1:D:99:LYS:HG2	1:D:185:THR:O	2.21	0.41
1:A:105:LYS:HG2	1:A:179:ASN:CA	2.47	0.40
1:A:144:GLN:HE22	1:C:139:GLU:CB	2.25	0.40
1:D:106:GLY:O	1:D:108:ASN:N	2.54	0.40
1:D:161:ASN:ND2	1:D:163:GLU:OE2	2.54	0.40
1:D:155:ALA:HB1	1:D:163:GLU:OE2	2.20	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	85/101 (84%)	73 (86%)	7 (8%)	5 (6%)	1 4
1	B	84/101 (83%)	77 (92%)	6 (7%)	1 (1%)	13 35
1	C	82/101 (81%)	72 (88%)	5 (6%)	5 (6%)	1 3
1	D	83/101 (82%)	61 (74%)	15 (18%)	7 (8%)	1 1
All	All	334/404 (83%)	283 (85%)	33 (10%)	18 (5%)	2 5

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	163	GLU
1	C	163	GLU
1	D	107	ASP
1	D	140	SER
1	D	163	GLU
1	A	165	ILE
1	D	158	ASN
1	A	159	GLY
1	A	160	LEU
1	A	167	HIS
1	B	135	ALA
1	C	168	ARG
1	C	99	LYS
1	D	137	VAL
1	D	139	GLU
1	D	191	GLU
1	C	167	HIS
1	C	100	VAL

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	72/85 (85%)	66 (92%)	6 (8%)	11 29
1	B	74/85 (87%)	68 (92%)	6 (8%)	11 30
1	C	74/85 (87%)	65 (88%)	9 (12%)	5 13
1	D	72/85 (85%)	65 (90%)	7 (10%)	8 22
All	All	292/340 (86%)	264 (90%)	28 (10%)	8 22

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	101	LEU
1	A	118	TYR
1	A	149	THR
1	A	154	ILE
1	A	177	SER
1	A	191	GLU
1	B	101	LEU
1	B	104	GLU
1	B	105	LYS
1	B	138	HIS
1	B	139	GLU
1	B	169	GLU
1	C	98	ARG
1	C	101	LEU
1	C	109	GLN
1	C	142	PRO
1	C	149	THR
1	C	163	GLU
1	C	166	ARG
1	C	171	VAL
1	C	180	VAL
1	D	98	ARG
1	D	101	LEU
1	D	110	THR

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Mol	Chain	Res	Type
1	D	118	TYR
1	D	171	VAL
1	D	181	LEU
1	D	184	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	109	GLN
1	A	138	HIS
1	A	144	GLN
1	A	161	ASN
1	A	193	GLN
1	B	108	ASN
1	B	116	GLN
1	C	116	GLN
1	D	108	ASN
1	D	116	GLN
1	D	158	ASN
1	D	161	ASN
1	D	193	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

2 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	PO4	C	195	-	4,4,4	1.73	1 (25%)	6,6,6	0.43	0
2	PO4	B	195	-	4,4,4	1.70	1 (25%)	6,6,6	0.46	0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	195	PO4	P-O3	-2.02	1.48	1.54
2	B	195	PO4	P-O2	-2.01	1.48	1.54

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	195	PO4	2	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 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	88/101 (87%)	0.87	10 (11%) 5 3	22, 52, 63, 69	2 (2%)
1	B	89/101 (88%)	0.18	2 (2%) 62 59	10, 27, 50, 53	0
1	C	87/101 (86%)	0.09	0 100 100	8, 22, 46, 54	0
1	D	86/101 (85%)	1.07	19 (22%) 0 0	22, 53, 64, 70	1 (1%)
All	All	350/404 (86%)	0.55	31 (8%) 9 6	8, 38, 62, 70	3 (0%)

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	142	PRO	3.9
1	A	194	LEU	3.7
1	D	131	VAL	3.7
1	D	194	LEU	3.5
1	D	155	ALA	3.4
1	D	147	GLY	3.3
1	A	131	VAL	3.3
1	D	164	GLY	3.3
1	D	103	LEU	3.0
1	B	187	TYR	2.9
1	D	163	GLU	2.9
1	D	180	VAL	2.7
1	D	176	ALA	2.6
1	A	119	GLY	2.6
1	D	161	ASN	2.6
1	B	194	LEU	2.5
1	A	160	LEU	2.5
1	D	183	LEU	2.5
1	A	155	ALA	2.4
1	D	119	GLY	2.4
1	A	113	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	162	VAL	2.3
1	A	174	ILE	2.3
1	A	157	VAL	2.2
1	A	162	VAL	2.2
1	D	174	ILE	2.1
1	D	111	PHE	2.1
1	D	185	THR	2.1
1	A	154	ILE	2.1
1	D	99	LYS	2.1
1	D	98	ARG	2.1

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 monosaccharides 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. 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	B-factors(Å^2)	Q<0.9
2	PO4	B	195	5/5	0.96	0.19	18,19,20,23	0
2	PO4	C	195	5/5	0.97	0.15	17,17,18,22	0

6.5 Other polymers (i)

There are no such residues in this entry.