Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 10:21 AM JST

PDB ID	:	6LKZ
Title	:	Crystal structure of isocitrate dehydrogenase 1 from Phaeodactylum tricornutum
Authors	:	Zhu, G.P.
Deposited on	:	2019-12-21
Resolution	:	2.80 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 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:

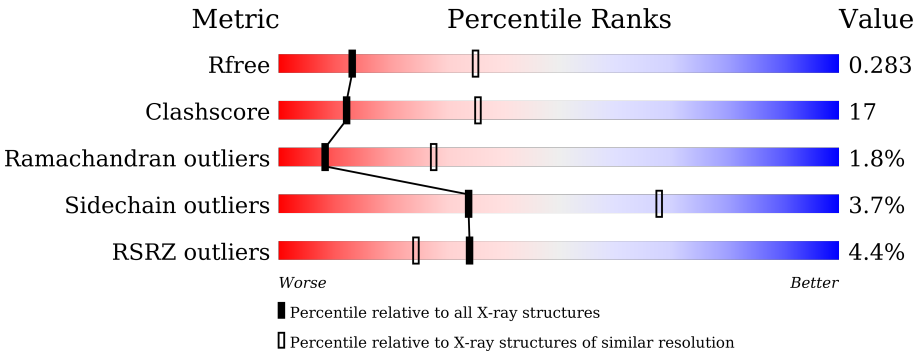
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.80 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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	C	495	3% 69% 26%
1	D	495	5% 69% 23% 5%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 7688 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 isocitrate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	482	Total	C	N	O	S	0	0	0
			3832	2428	665	724	15			
1	D	482	Total	C	N	O	S	0	0	0
			3832	2428	665	724	15			

- Molecule 2 is water.

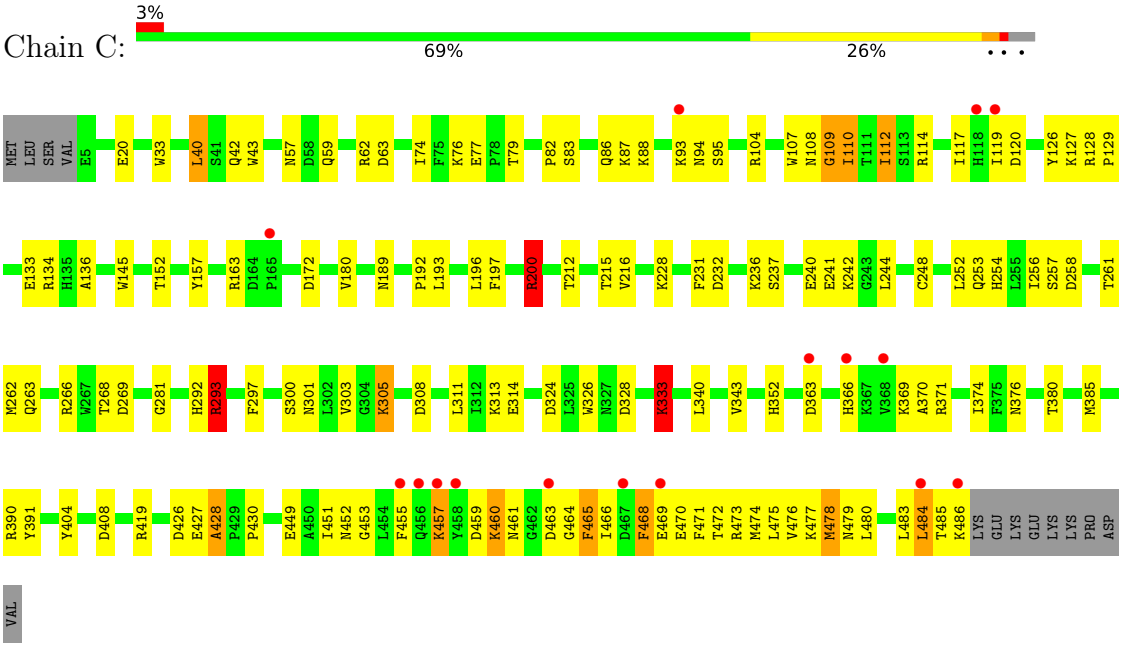
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	C	12	Total	O	0	0
			12	12		
2	D	12	Total	O	0	0
			12	12		

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.

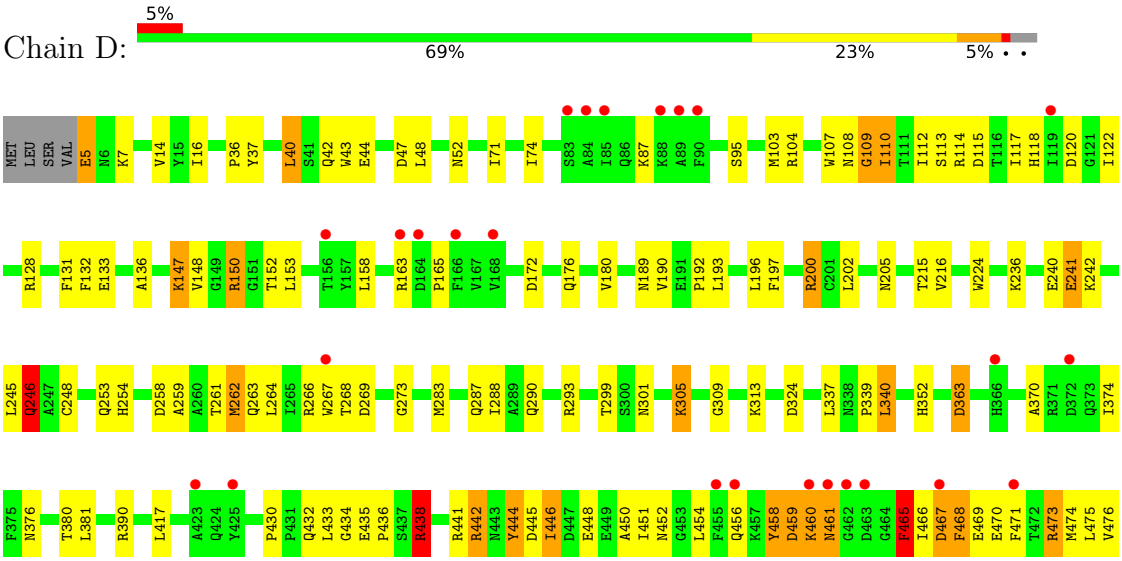
• Molecule 1: isocitrate dehydrogenase

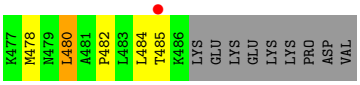
Chain C:



• Molecule 1: isocitrate dehydrogenase

Chain D:




R477
M478
N479
L480
A481
P482
L483
L484
T485
R486
LYS
GLU
LYS
GLU
LYS
LYS
PRO
ASP
VAL

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	71.97Å 128.55Å 124.30Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.04 – 2.80 47.04 – 2.56	Depositor EDS
% Data completeness (in resolution range)	100.0 (47.04-2.80) 100.0 (47.04-2.56)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.08 (at 2.54Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.227 , 0.283 0.227 , 0.283	Depositor DCC
R_{free} test set	1861 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å^2)	69.5	Xtriage
Anisotropy	0.056	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 40.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.005 for -h,l,k	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	7688	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.75% 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	C	0.54	0/3927	0.86	13/5325 (0.2%)
1	D	0.59	2/3927 (0.1%)	0.92	22/5325 (0.4%)
All	All	0.56	2/7854 (0.0%)	0.89	35/10650 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1
1	D	0	2
All	All	0	3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	113	SER	CA-CB	5.63	1.61	1.52
1	D	435	GLU	CB-CG	-5.49	1.41	1.52

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	484	LEU	CA-CB-CG	13.59	146.55	115.30
1	D	465	PHE	CB-CG-CD2	-10.39	113.53	120.80
1	D	150	ARG	CG-CD-NE	-8.95	93.02	111.80
1	C	457	LYS	CD-CE-NZ	8.76	131.84	111.70
1	D	150	ARG	NE-CZ-NH2	-7.47	116.56	120.30
1	D	246	GLN	CA-CB-CG	-7.20	97.57	113.40
1	D	200	ARG	NE-CZ-NH2	-6.94	116.83	120.30
1	D	442	ARG	NE-CZ-NH1	-6.89	116.85	120.30
1	D	438	ARG	NE-CZ-NH2	-6.85	116.87	120.30
1	D	363	ASP	CB-CG-OD1	-6.65	112.31	118.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	93	LYS	CA-CB-CG	6.39	127.45	113.40
1	D	200	ARG	CG-CD-NE	-6.25	98.67	111.80
1	D	258	ASP	CB-CG-OD1	-5.93	112.96	118.30
1	C	93	LYS	CB-CA-C	5.88	122.16	110.40
1	D	467	ASP	CB-CG-OD1	-5.86	113.02	118.30
1	D	480	LEU	CA-CB-CG	5.79	128.62	115.30
1	D	190	VAL	C-N-CA	-5.71	107.42	121.70
1	C	333	LYS	CD-CE-NZ	-5.62	98.78	111.70
1	C	104	ARG	NE-CZ-NH1	5.56	123.08	120.30
1	D	163	ARG	CA-CB-CG	-5.53	101.23	113.40
1	C	293	ARG	NE-CZ-NH1	5.50	123.05	120.30
1	C	200	ARG	CA-CB-CG	5.50	125.50	113.40
1	D	241	GLU	CB-CA-C	5.50	121.40	110.40
1	C	112	ILE	CG1-CB-CG2	-5.45	99.42	111.40
1	D	465	PHE	CB-CA-C	-5.37	99.67	110.40
1	D	460	LYS	CD-CE-NZ	-5.35	99.39	111.70
1	D	104	ARG	CG-CD-NE	5.33	123.00	111.80
1	D	200	ARG	NE-CZ-NH1	5.32	122.96	120.30
1	C	333	LYS	CA-CB-CG	5.31	125.08	113.40
1	D	340	LEU	CB-CG-CD1	-5.31	101.98	111.00
1	C	308	ASP	CB-CG-OD2	-5.30	113.53	118.30
1	C	340	LEU	CA-CB-CG	5.13	127.11	115.30
1	D	480	LEU	CB-CG-CD2	5.12	119.71	111.00
1	C	308	ASP	CB-CG-OD1	5.12	122.91	118.30
1	D	258	ASP	CB-CG-OD2	5.06	122.85	118.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	109	GLY	Peptide
1	D	109	GLY	Peptide
1	D	465	PHE	Sidechain

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	C	3832	0	3705	142	1
1	D	3832	0	3705	134	1
2	C	12	0	0	0	0
2	D	12	0	0	0	0
All	All	7688	0	7410	257	1

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 17.

All (257) 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:C:117:ILE:HG22	1:C:119:ILE:HD13	1.27	1.15
1:D:458:TYR:HE2	1:D:474:MET:HA	1.19	1.08
1:C:117:ILE:CG2	1:C:119:ILE:HD13	1.92	0.99
1:C:117:ILE:HG22	1:C:119:ILE:CD1	1.92	0.98
1:C:114:ARG:HD3	1:C:200:ARG:NH2	1.78	0.97
1:D:470:GLU:HA	1:D:473:ARG:NH1	1.80	0.96
1:C:117:ILE:CG2	1:C:119:ILE:CD1	2.46	0.93
1:D:5:GLU:HG3	1:D:7:LYS:HE3	1.50	0.93
1:D:460:LYS:O	1:D:460:LYS:HG3	1.67	0.93
1:C:343:VAL:HG11	1:C:385:MET:HE1	1.50	0.92
1:D:44:GLU:OE1	1:D:71:ILE:HD11	1.72	0.90
1:C:82:PRO:HA	1:C:86:GLN:NE2	1.89	0.88
1:C:110:ILE:HG21	1:C:193:LEU:HD12	1.55	0.88
1:D:87:LYS:HE2	1:D:95:SER:HB3	1.55	0.87
1:D:458:TYR:CE2	1:D:474:MET:HA	2.09	0.87
1:C:473:ARG:HG2	1:C:477:LYS:HD2	1.55	0.86
1:D:110:ILE:HG21	1:D:193:LEU:HD12	1.59	0.85
1:D:461:ASN:ND2	1:D:465:PHE:CD2	2.47	0.83
1:D:112:ILE:HG21	1:D:114:ARG:HE	1.45	0.81
1:C:473:ARG:NH1	1:C:477:LYS:HD2	1.97	0.80
1:D:461:ASN:ND2	1:D:465:PHE:HD2	1.80	0.80
1:D:470:GLU:HA	1:D:473:ARG:HH11	1.40	0.80
1:D:438:ARG:HH11	1:D:438:ARG:HG2	1.45	0.80
1:C:468:PHE:HZ	1:D:452:ASN:HA	1.48	0.78
1:C:114:ARG:HD3	1:C:200:ARG:HH21	1.50	0.76
1:C:110:ILE:HA	1:C:136:ALA:HB2	1.68	0.76
1:D:150:ARG:HD2	1:D:176:GLN:HG2	1.67	0.75
1:D:461:ASN:CG	1:D:465:PHE:CD2	2.60	0.75
1:D:290:GLN:HE22	1:D:441:ARG:HH22	1.35	0.74
1:D:109:GLY:O	1:D:110:ILE:HG23	1.86	0.73

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:483:LEU:HD23	1:C:484:LEU:HB3	1.68	0.73
1:D:5:GLU:HG2	1:D:7:LYS:HG3	1.71	0.73
1:D:118:HIS:NE2	1:D:340:LEU:HD11	2.04	0.72
1:C:196:LEU:O	1:C:200:ARG:HG3	1.89	0.71
1:C:117:ILE:HG21	1:C:119:ILE:CD1	2.20	0.70
1:C:483:LEU:HD23	1:C:484:LEU:H	1.57	0.70
1:C:478:MET:HB2	1:C:480:LEU:HD22	1.73	0.70
1:C:474:MET:O	1:C:478:MET:HG3	1.90	0.70
1:D:110:ILE:HA	1:D:136:ALA:HB2	1.74	0.69
1:D:461:ASN:CG	1:D:465:PHE:HD2	1.95	0.69
1:C:460:LYS:HG3	1:C:461:ASN:H	1.57	0.69
1:C:117:ILE:CG2	1:C:119:ILE:HD11	2.21	0.69
1:C:112:ILE:HG13	1:C:133:GLU:OE1	1.92	0.69
1:D:215:THR:HG23	1:D:216:VAL:HG23	1.74	0.69
1:C:461:ASN:O	1:C:465:PHE:HB3	1.93	0.68
1:C:478:MET:HB2	1:C:480:LEU:CD2	2.24	0.68
1:C:461:ASN:ND2	1:C:465:PHE:O	2.15	0.68
1:D:205:ASN:OD1	1:D:242:LYS:NZ	2.26	0.67
1:D:147:LYS:H	1:D:147:LYS:HD3	1.60	0.67
1:C:484:LEU:HD23	1:C:485:THR:O	1.93	0.67
1:C:114:ARG:HD3	1:C:200:ARG:HH22	1.59	0.67
1:C:473:ARG:HG2	1:C:477:LYS:CD	2.24	0.66
1:C:473:ARG:HH11	1:C:477:LYS:HD2	1.59	0.65
1:C:83:SER:H	1:C:86:GLN:NE2	1.94	0.65
1:C:472:THR:O	1:C:476:VAL:HG23	1.95	0.65
1:D:152:THR:HG22	1:D:172:ASP:HA	1.80	0.64
1:C:468:PHE:O	1:C:471:PHE:N	2.30	0.64
1:D:450:ALA:O	1:D:454:LEU:HD12	1.98	0.64
1:C:117:ILE:HG21	1:C:119:ILE:HD11	1.77	0.63
1:C:133:GLU:OE2	1:C:200:ARG:NH1	2.32	0.63
1:C:40:LEU:O	1:C:42:GLN:N	2.31	0.63
1:C:258:ASP:HA	1:C:261:THR:HG22	1.80	0.63
1:C:468:PHE:CZ	1:D:452:ASN:HA	2.31	0.63
1:D:114:ARG:NE	1:D:200:ARG:HH22	1.97	0.63
1:D:313:LYS:HB2	1:D:352:HIS:CD2	2.33	0.62
1:C:459:ASP:OD1	1:C:470:GLU:HB3	2.00	0.62
1:D:470:GLU:CA	1:D:473:ARG:NH1	2.58	0.62
1:C:109:GLY:O	1:C:110:ILE:HG23	2.00	0.62
1:D:47:ASP:HB3	1:D:52:ASN:HD22	1.65	0.62
1:D:14:VAL:HB	1:D:74:ILE:HB	1.81	0.62
1:D:40:LEU:O	1:D:42:GLN:N	2.32	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:293:ARG:HD3	1:C:297:PHE:CZ	2.35	0.62
1:C:87:LYS:NZ	1:C:95:SER:HB3	2.15	0.61
1:C:212:THR:OG1	1:C:254:HIS:NE2	2.26	0.61
1:C:484:LEU:HD12	1:D:445:ASP:HB2	1.81	0.61
1:C:468:PHE:HD2	1:C:472:THR:HG23	1.66	0.60
1:C:479:ASN:HD22	1:D:290:GLN:HE21	1.48	0.60
1:C:59:GLN:OE1	1:C:62:ARG:NH1	2.35	0.60
1:C:404:TYR:HB3	1:C:408:ASP:HB2	1.85	0.59
1:C:134:ARG:HG3	1:C:281:GLY:HA3	1.85	0.59
1:D:283:MET:O	1:D:287:GLN:HG3	2.03	0.59
1:D:147:LYS:H	1:D:147:LYS:CD	2.16	0.59
1:D:110:ILE:CG2	1:D:193:LEU:HD12	2.32	0.58
1:C:468:PHE:O	1:C:470:GLU:N	2.36	0.58
1:D:438:ARG:HG2	1:D:438:ARG:NH1	2.16	0.58
1:C:215:THR:HG23	1:C:216:VAL:HG23	1.86	0.58
1:C:461:ASN:HB3	1:C:470:GLU:OE1	2.04	0.57
1:D:112:ILE:HG21	1:D:114:ARG:NE	2.17	0.57
1:C:248:CYS:HB2	1:C:253:GLN:HG2	1.86	0.56
1:C:479:ASN:ND2	1:D:290:GLN:HE21	2.02	0.56
1:C:483:LEU:HA	1:D:446:ILE:HA	1.87	0.56
1:C:133:GLU:HG3	1:C:197:PHE:HB2	1.87	0.56
1:D:112:ILE:HG13	1:D:133:GLU:OE1	2.06	0.56
1:D:114:ARG:NE	1:D:200:ARG:NH2	2.54	0.55
1:C:460:LYS:HG3	1:C:461:ASN:N	2.20	0.55
1:D:5:GLU:CG	1:D:7:LYS:HE3	2.32	0.55
1:D:150:ARG:HD2	1:D:176:GLN:HE21	1.70	0.55
1:D:448:GLU:HG2	1:D:451:ILE:HD11	1.88	0.55
1:C:256:ILE:HD12	1:C:258:ASP:H	1.71	0.55
1:D:150:ARG:CD	1:D:176:GLN:HE21	2.19	0.55
1:C:83:SER:H	1:C:86:GLN:HE21	1.54	0.55
1:C:313:LYS:HB2	1:C:352:HIS:CD2	2.41	0.55
1:C:112:ILE:HG22	1:C:114:ARG:HG2	1.89	0.55
1:C:479:ASN:O	1:C:480:LEU:HD13	2.06	0.55
1:D:16:ILE:CD1	1:D:74:ILE:HD11	2.37	0.55
1:D:74:ILE:HD13	1:D:107:TRP:CH2	2.42	0.55
1:D:261:THR:HA	1:D:264:LEU:HD13	1.87	0.55
1:C:468:PHE:CD2	1:C:472:THR:HG23	2.41	0.55
1:C:74:ILE:HD13	1:C:107:TRP:CH2	2.41	0.54
1:D:153:LEU:HD13	1:D:180:VAL:HG11	1.89	0.54
1:D:36:PRO:HB2	1:D:37:TYR:CD2	2.42	0.54
1:D:475:LEU:HD22	1:D:480:LEU:HB3	1.89	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:47:ASP:HB3	1:D:52:ASN:ND2	2.22	0.54
1:D:470:GLU:CA	1:D:473:ARG:HH12	2.21	0.54
1:C:468:PHE:HD2	1:C:472:THR:CG2	2.21	0.54
1:C:419:ARG:NH2	1:C:426:ASP:HB2	2.23	0.53
1:C:57:ASN:ND2	1:C:94:ASN:HD21	2.06	0.53
1:C:262:MET:HB3	1:C:266:ARG:HH12	1.74	0.53
1:D:172:ASP:OD1	1:D:172:ASP:N	2.36	0.53
1:D:456:GLN:O	1:D:459:ASP:HB2	2.09	0.53
1:C:468:PHE:HE2	1:D:451:ILE:CD1	2.22	0.53
1:C:114:ARG:HH21	1:C:301:ASN:HD22	1.57	0.53
1:C:172:ASP:OD1	1:C:172:ASP:N	2.33	0.52
1:D:484:LEU:HD12	1:D:485:THR:H	1.74	0.52
1:D:266:ARG:O	1:D:268:THR:N	2.40	0.52
1:C:110:ILE:CA	1:C:136:ALA:HB2	2.39	0.52
1:D:263:GLN:HE21	1:D:267:TRP:HB3	1.75	0.52
1:C:145:TRP:HA	1:C:180:VAL:O	2.10	0.51
1:C:82:PRO:HA	1:C:86:GLN:HE22	1.70	0.51
1:D:245:LEU:C	1:D:246:GLN:HG2	2.25	0.51
1:D:381:LEU:HA	1:D:417:LEU:HD23	1.91	0.51
1:D:466:ILE:HA	1:D:470:GLU:HB2	1.91	0.51
1:C:108:ASN:HB2	1:C:305:LYS:H	1.76	0.51
1:C:126:TYR:HD2	1:C:292:HIS:HB2	1.75	0.51
1:C:87:LYS:HZ3	1:C:95:SER:HB3	1.74	0.51
1:C:463:ASP:O	1:C:465:PHE:N	2.44	0.51
1:D:110:ILE:CA	1:D:136:ALA:HB2	2.39	0.51
1:C:189:ASN:HA	1:C:192:PRO:HD2	1.93	0.51
1:C:468:PHE:HE2	1:D:451:ILE:HD12	1.75	0.50
1:C:476:VAL:HG11	1:D:438:ARG:HB2	1.93	0.50
1:C:126:TYR:O	1:C:127:LYS:HB3	2.10	0.50
1:D:474:MET:HG2	1:D:478:MET:CE	2.42	0.50
1:C:112:ILE:HD13	1:C:303:VAL:HG23	1.93	0.50
1:C:472:THR:HG22	1:D:451:ILE:HD13	1.93	0.49
1:C:120:ASP:HB3	1:C:390:ARG:NH1	2.28	0.49
1:C:370:ALA:O	1:C:374:ILE:HG12	2.12	0.49
1:D:236:LYS:O	1:D:240:GLU:HG2	2.12	0.49
1:C:476:VAL:HG13	1:D:444:TYR:OH	2.12	0.49
1:D:115:ASP:OD2	1:D:117:ILE:HD11	2.12	0.49
1:D:131:PHE:O	1:D:273:GLY:HA2	2.13	0.49
1:C:83:SER:N	1:C:86:GLN:HE21	2.11	0.49
1:C:426:ASP:O	1:C:428:ALA:N	2.45	0.49
1:D:114:ARG:HE	1:D:200:ARG:HH22	1.61	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:434:GLY:O	1:D:436:PRO:HD3	2.12	0.48
1:C:328:ASP:OD1	1:C:333:LYS:NZ	2.45	0.48
1:C:59:GLN:NE2	1:C:63:ASP:OD1	2.38	0.48
1:D:337:LEU:O	1:D:339:PRO:HD3	2.13	0.48
1:D:474:MET:HG2	1:D:478:MET:HE3	1.95	0.48
1:C:419:ARG:HH22	1:C:426:ASP:HB2	1.79	0.48
1:C:453:GLY:O	1:C:457:LYS:HB3	2.13	0.48
1:C:236:LYS:O	1:C:240:GLU:HG2	2.13	0.48
1:D:110:ILE:HA	1:D:136:ALA:CB	2.43	0.48
1:C:110:ILE:HA	1:C:136:ALA:CB	2.42	0.48
1:C:40:LEU:HD12	1:C:43:TRP:CE2	2.48	0.48
1:C:109:GLY:C	1:C:110:ILE:HG23	2.34	0.48
1:C:455:PHE:CD2	1:D:468:PHE:HB2	2.50	0.47
1:D:459:ASP:O	1:D:470:GLU:OE2	2.32	0.47
1:C:76:LYS:NZ	1:C:79:THR:HG23	2.30	0.47
1:C:293:ARG:HD3	1:C:297:PHE:CE1	2.49	0.47
1:D:40:LEU:HD12	1:D:43:TRP:CE2	2.49	0.47
1:C:474:MET:HA	1:C:477:LYS:NZ	2.30	0.47
1:D:36:PRO:HB2	1:D:37:TYR:CE2	2.49	0.47
1:D:103:MET:HB3	1:D:107:TRP:CZ3	2.50	0.47
1:D:112:ILE:HD12	1:D:112:ILE:N	2.30	0.47
1:D:248:CYS:HB2	1:D:253:GLN:HG3	1.96	0.47
1:D:264:LEU:CD2	1:D:288:ILE:HG13	2.44	0.47
1:D:432:GLN:O	1:D:433:LEU:HD23	2.14	0.47
1:D:470:GLU:N	1:D:473:ARG:HH12	2.12	0.47
1:C:237:SER:O	1:C:241:GLU:HG3	2.15	0.47
1:C:476:VAL:CG1	1:D:438:ARG:HB2	2.44	0.46
1:C:126:TYR:CD2	1:C:292:HIS:HB2	2.50	0.46
1:D:16:ILE:HD11	1:D:74:ILE:HD11	1.98	0.46
1:D:259:ALA:HA	1:D:262:MET:HG3	1.98	0.46
1:D:376:ASN:O	1:D:380:THR:HG23	2.15	0.46
1:D:484:LEU:HD12	1:D:485:THR:HG23	1.97	0.46
1:D:120:ASP:O	1:D:390:ARG:HD2	2.15	0.46
1:D:467:ASP:O	1:D:469:GLU:N	2.45	0.46
1:D:299:THR:HG23	1:D:301:ASN:CG	2.36	0.46
1:C:459:ASP:OD2	1:C:474:MET:CE	2.65	0.45
1:C:126:TYR:O	1:C:128:ARG:N	2.49	0.45
1:D:118:HIS:N	1:D:118:HIS:CD2	2.85	0.45
1:C:449:GLU:HA	1:C:452:ASN:HD22	1.82	0.45
1:D:263:GLN:NE2	1:D:267:TRP:HB3	2.30	0.45
1:C:477:LYS:HA	1:D:438:ARG:CZ	2.47	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:33:TRP:HZ3	1:C:343:VAL:HG21	1.81	0.45
1:D:224:TRP:CZ3	1:D:254:HIS:HB2	2.52	0.45
1:C:455:PHE:CE2	1:D:468:PHE:HB2	2.52	0.44
1:C:385:MET:HE2	1:C:385:MET:HB2	1.72	0.44
1:C:483:LEU:CD2	1:C:484:LEU:H	2.29	0.44
1:C:76:LYS:HG2	1:C:77:GLU:O	2.17	0.44
1:D:458:TYR:HE2	1:D:474:MET:CA	2.09	0.44
1:D:118:HIS:HD1	1:D:122:ILE:HD12	1.82	0.44
1:C:74:ILE:HD13	1:C:107:TRP:CZ2	2.52	0.44
1:C:112:ILE:N	1:C:112:ILE:HD12	2.33	0.44
1:C:473:ARG:O	1:C:476:VAL:N	2.51	0.44
1:D:305:LYS:HD2	1:D:309:GLY:O	2.17	0.44
1:C:128:ARG:HG3	1:C:129:PRO:HD2	2.00	0.44
1:C:110:ILE:HG22	1:C:136:ALA:H	1.82	0.44
1:C:228:LYS:HE3	1:C:232:ASP:OD2	2.18	0.44
1:D:381:LEU:HA	1:D:417:LEU:CD2	2.48	0.43
1:C:479:ASN:O	1:C:479:ASN:OD1	2.36	0.43
1:D:261:THR:O	1:D:261:THR:OG1	2.36	0.43
1:C:244:LEU:HD23	1:C:244:LEU:HA	1.87	0.43
1:C:20:GLU:HA	1:C:326:TRP:CE2	2.54	0.43
1:C:74:ILE:O	1:C:314:GLU:HA	2.17	0.43
1:C:449:GLU:O	1:C:452:ASN:HB2	2.18	0.43
1:C:376:ASN:O	1:C:380:THR:HG23	2.18	0.43
1:C:157:TYR:CE2	1:D:148:VAL:HB	2.54	0.43
1:D:109:GLY:C	1:D:110:ILE:HG23	2.39	0.43
1:D:16:ILE:HG23	1:D:48:LEU:HD13	2.00	0.42
1:D:460:LYS:O	1:D:460:LYS:CG	2.52	0.42
1:D:471:PHE:O	1:D:474:MET:HB3	2.19	0.42
1:D:189:ASN:HA	1:D:192:PRO:HD2	2.00	0.42
1:C:471:PHE:HE1	1:D:474:MET:SD	2.43	0.42
1:D:128:ARG:HG3	1:D:269:ASP:O	2.20	0.42
1:D:390:ARG:HB3	1:D:430:PRO:HB2	2.02	0.42
1:D:112:ILE:CG2	1:D:114:ARG:HE	2.25	0.42
1:C:468:PHE:CD2	1:C:472:THR:CG2	3.02	0.42
1:C:460:LYS:CG	1:C:461:ASN:N	2.83	0.42
1:D:370:ALA:O	1:D:374:ILE:HG12	2.19	0.42
1:C:477:LYS:HB2	1:C:477:LYS:HE2	1.75	0.41
1:D:158:LEU:CD1	1:D:165:PRO:HG3	2.50	0.41
1:C:263:GLN:O	1:C:263:GLN:HG2	2.18	0.41
1:D:114:ARG:HE	1:D:200:ARG:NH2	2.17	0.41
1:D:290:GLN:NE2	1:D:441:ARG:HH22	2.09	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:459:ASP:HB3	1:D:460:LYS:H	1.49	0.41
1:C:152:THR:HG22	1:C:172:ASP:HA	2.02	0.41
1:D:202:LEU:HD23	1:D:202:LEU:HA	1.73	0.41
1:C:391:TYR:OH	1:C:430:PRO:HD3	2.20	0.41
1:C:157:TYR:CZ	1:D:148:VAL:HB	2.56	0.41
1:C:266:ARG:O	1:C:268:THR:N	2.54	0.41
1:C:366:HIS:O	1:C:366:HIS:CG	2.74	0.41
1:D:110:ILE:HD12	1:D:110:ILE:C	2.41	0.41
1:D:480:LEU:O	1:D:480:LEU:HD23	2.21	0.41
1:C:110:ILE:HD12	1:C:112:ILE:HD11	2.03	0.41
1:C:324:ASP:OD1	1:C:324:ASP:N	2.52	0.41
1:D:108:ASN:HB2	1:D:305:LYS:H	1.85	0.41
1:D:473:ARG:O	1:D:476:VAL:HG22	2.21	0.41
1:C:231:PHE:CD2	1:C:252:LEU:HB2	2.56	0.40
1:C:451:ILE:HD11	1:D:482:PRO:HD2	2.04	0.40
1:D:324:ASP:OD1	1:D:324:ASP:N	2.53	0.40
1:C:114:ARG:NH2	1:C:301:ASN:HD22	2.20	0.40
1:C:196:LEU:HD23	1:C:196:LEU:HA	1.75	0.40
1:D:5:GLU:HG3	1:D:7:LYS:CE	2.37	0.40
1:D:196:LEU:HD23	1:D:196:LEU:HA	1.89	0.40
1:D:197:PHE:O	1:D:200:ARG:HG2	2.20	0.40
1:C:466:ILE:HG23	1:C:470:GLU:HB2	2.04	0.40

All (1) 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)
1:C:242:LYS:NZ	1:D:241:GLU:OE1[1_455]	1.79	0.41

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	C	480/495 (97%)	434 (90%)	37 (8%)	9 (2%)	8 26
1	D	480/495 (97%)	428 (89%)	44 (9%)	8 (2%)	9 29
All	All	960/990 (97%)	862 (90%)	81 (8%)	17 (2%)	8 28

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	428	ALA
1	C	460	LYS
1	C	469	GLU
1	D	465	PHE
1	D	468	PHE
1	C	464	GLY
1	D	293	ARG
1	D	446	ILE
1	C	427	GLU
1	D	458	TYR
1	C	293	ARG
1	C	40	LEU
1	D	110	ILE
1	C	465	PHE
1	D	40	LEU
1	D	461	ASN
1	C	110	ILE

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	C	406/419 (97%)	389 (96%)	17 (4%)	30 63
1	D	406/419 (97%)	393 (97%)	13 (3%)	39 73
All	All	812/838 (97%)	782 (96%)	30 (4%)	34 68

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	88	LYS
1	C	163	ARG
1	C	200	ARG
1	C	257	SER
1	C	269	ASP
1	C	293	ARG
1	C	300	SER
1	C	305	LYS
1	C	311	LEU
1	C	333	LYS
1	C	363	ASP
1	C	369	LYS
1	C	371	ARG
1	C	468	PHE
1	C	475	LEU
1	C	478	MET
1	C	486	LYS
1	D	5	GLU
1	D	132	PHE
1	D	147	LYS
1	D	246	GLN
1	D	262	MET
1	D	305	LYS
1	D	363	ASP
1	D	438	ARG
1	D	442	ARG
1	D	444	TYR
1	D	459	ASP
1	D	465	PHE
1	D	473	ARG

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

Mol	Chain	Res	Type
1	C	57	ASN
1	C	86	GLN
1	C	287	GLN
1	C	452	ASN
1	C	479	ASN
1	D	52	ASN
1	D	94	ASN
1	D	176	GLN
1	D	246	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	263	GLN
1	D	290	GLN
1	D	424	GLN
1	D	461	ASN

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 monosaccharides 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	C	482/495 (97%)	-0.14	16 (3%)	46	36	33, 57, 108, 137	0
1	D	482/495 (97%)	-0.01	26 (5%)	25	17	33, 57, 116, 137	0
All	All	964/990 (97%)	-0.08	42 (4%)	34	24	33, 57, 113, 137	0

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	89	ALA	4.0
1	C	457	LYS	4.0
1	D	119	ILE	3.8
1	D	461	ASN	3.7
1	C	366	HIS	3.7
1	D	156	THR	3.7
1	D	455	PHE	3.6
1	D	163	ARG	3.5
1	C	368	VAL	3.4
1	D	90	PHE	3.4
1	C	463	ASP	3.3
1	D	425	TYR	3.3
1	D	366	HIS	3.3
1	C	455	PHE	3.1
1	D	166	PHE	3.0
1	C	469	GLU	3.0
1	C	467	ASP	3.0
1	D	164	ASP	3.0
1	D	88	LYS	3.0
1	C	456	GLN	3.0
1	D	456	GLN	2.8
1	C	165	PRO	2.8
1	C	363	ASP	2.7
1	D	168	VAL	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	471	PHE	2.7
1	C	486	LYS	2.6
1	D	467	ASP	2.6
1	D	84	ALA	2.6
1	C	458	TYR	2.4
1	D	462	GLY	2.4
1	D	267	TRP	2.4
1	D	83	SER	2.3
1	D	460	LYS	2.3
1	C	484	LEU	2.3
1	D	485	THR	2.2
1	D	372	ASP	2.2
1	D	463	ASP	2.2
1	C	93	LYS	2.2
1	D	85	ILE	2.1
1	C	119	ILE	2.0
1	C	118	HIS	2.0
1	D	423	ALA	2.0

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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.