Full wwPDB X-ray Structure Validation Report ⓘ

Jan 27, 2021 – 09:07 AM GMT

PDB ID	:	6YSB
Title	:	Crystal structure of Malus domestica Double Bond Reductase (MdDBR) apo form
Authors	:	Caliandro, R.; Polsinelli, I.; Demitri, N.; Benini, S.
Deposited on	:	2020-04-21
Resolution	:	1.20 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:

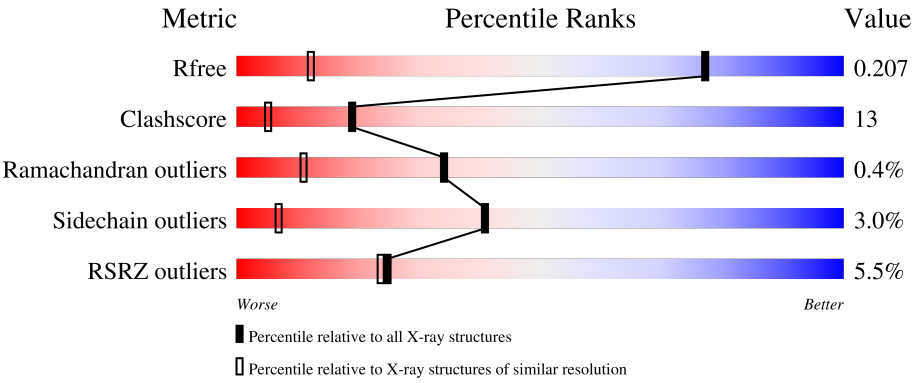
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.16
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.16

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 1.20 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	1223 (1.22-1.18)
Clashscore	141614	1286 (1.22-1.18)
Ramachandran outliers	138981	1240 (1.22-1.18)
Sidechain outliers	138945	1239 (1.22-1.18)
RSRZ outliers	127900	1200 (1.22-1.18)

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	349	6% 81% 12%
1	B	349	4% 83% 12%

2 Entry composition

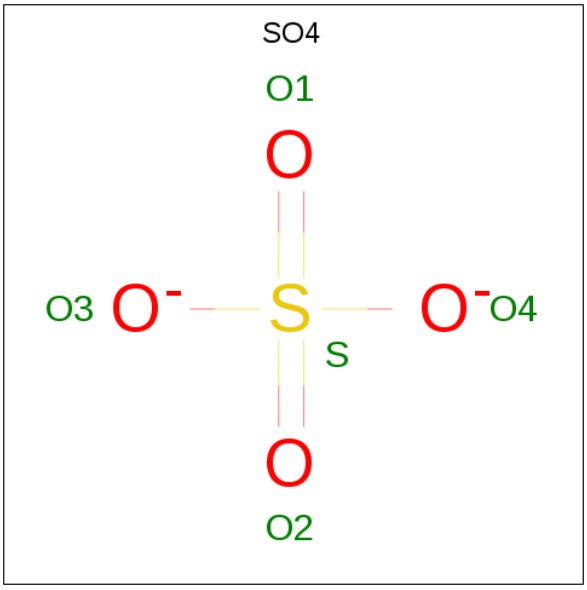
There are 3 unique types of molecules in this entry. The entry contains 5798 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 2-alkenal reductase (NADP(+)-dependent)-like.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	339	Total	C	N	O	S	0	0	0
			2629	1699	424	490	16			
1	A	339	Total	C	N	O	S	0	0	0
			2632	1701	425	490	16			

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is water.

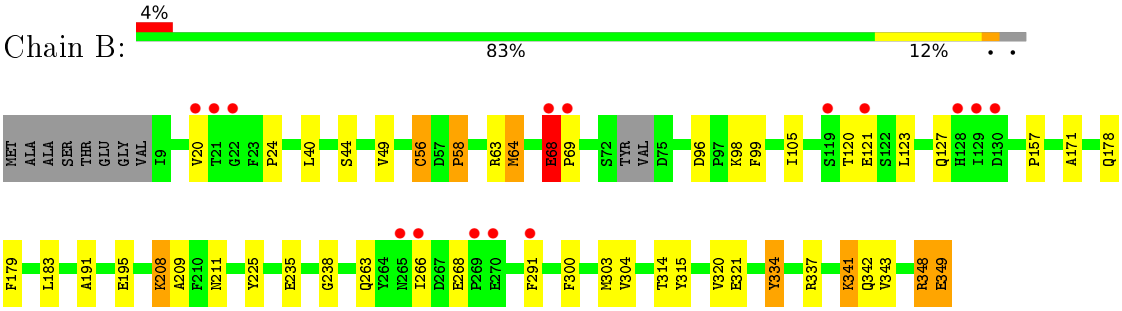
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	219	Total O 219 219	0	0
3	A	308	Total O 308 308	0	0

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.

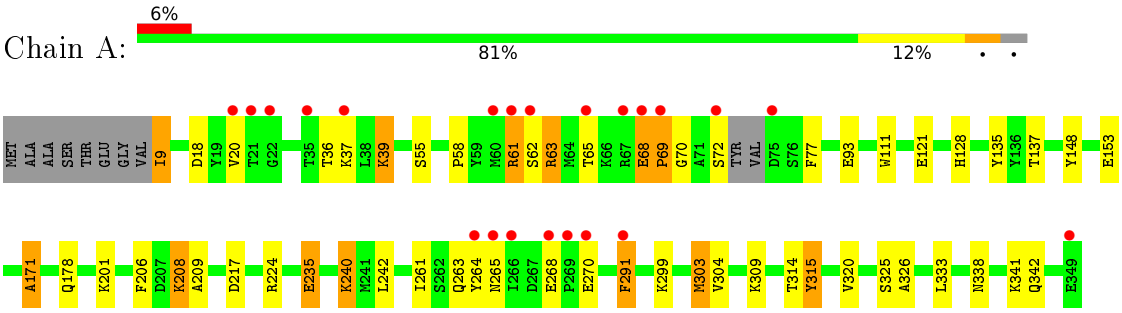
- Molecule 1: 2-alkenal reductase (NADP(+)-dependent)-like

Chain B:



- Molecule 1: 2-alkenal reductase (NADP(+)-dependent)-like

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	156.61Å 68.67Å 68.94Å 90.00° 111.38° 90.00°	Depositor
Resolution (Å)	48.62 – 1.20 48.57 – 1.20	Depositor EDS
% Data completeness (in resolution range)	99.4 (48.62-1.20) 99.4 (48.57-1.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.98 (at 1.20Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.162 , 0.198 0.170 , 0.207	Depositor DCC
R_{free} test set	10528 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	12.0	Xtriage
Anisotropy	0.691	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 45.0	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	0.97	EDS
Total number of atoms	5798	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.31% 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: SO4

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	1.01	6/2687 (0.2%)	1.13	11/3624 (0.3%)
1	B	0.89	4/2684 (0.1%)	1.02	3/3621 (0.1%)
All	All	0.95	10/5371 (0.2%)	1.08	14/7245 (0.2%)

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	A	0	1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	63	ARG	C-N	10.32	1.57	1.34
1	B	268	GLU	CD-OE1	6.51	1.32	1.25
1	A	72	SER	CB-OG	6.37	1.50	1.42
1	B	195	GLU	CD-OE2	-6.09	1.19	1.25
1	A	61	ARG	C-O	6.04	1.34	1.23
1	B	268	GLU	CD-OE2	5.73	1.31	1.25
1	A	63	ARG	CA-C	5.67	1.67	1.52
1	A	63	ARG	C-O	5.62	1.34	1.23
1	A	153	GLU	CD-OE1	-5.49	1.19	1.25
1	B	56	CYS	CB-SG	5.43	1.91	1.82

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	303	MET	CG-SD-CE	-8.52	86.56	100.20

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	171	ALA	N-CA-CB	6.66	119.42	110.10
1	B	334	TYR	CB-CG-CD1	6.59	124.96	121.00
1	A	235	GLU	OE1-CD-OE2	6.59	131.21	123.30
1	A	315	TYR	CB-CG-CD1	-5.97	117.42	121.00
1	B	63	ARG	NE-CZ-NH1	5.85	123.22	120.30
1	B	127	GLN	CB-CA-C	5.64	121.69	110.40
1	A	291	PHE	CB-CA-C	-5.60	99.19	110.40
1	A	135	TYR	CB-CG-CD2	-5.54	117.68	121.00
1	A	206	PHE	CB-CG-CD1	5.30	124.51	120.80
1	A	135	TYR	CB-CG-CD1	5.17	124.11	121.00
1	A	265	ASN	CB-CA-C	5.16	120.71	110.40
1	A	224	ARG	NE-CZ-NH2	-5.01	117.80	120.30
1	A	63	ARG	CD-NE-CZ	5.00	130.60	123.60

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	263	GLN	Mainchain

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	2632	0	2659	62	0
1	B	2629	0	2650	76	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
3	A	308	0	0	37	1
3	B	219	0	0	32	0
All	All	5798	0	5309	138	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 13.

All (138) 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:B:58:PRO:HG2	3:B:701:HOH:O	1.20	1.27
1:A:171:ALA:CB	3:A:507:HOH:O	1.69	1.26
1:A:171:ALA:HB1	3:A:731:HOH:O	1.12	1.25
1:B:105:ILE:HG13	3:B:680:HOH:O	1.14	1.25
1:B:334:TYR:HB2	3:B:501:HOH:O	1.21	1.24
1:A:171:ALA:HB3	3:A:507:HOH:O	1.21	1.18
1:B:334:TYR:O	3:B:504:HOH:O	1.63	1.13
1:B:343:VAL:C	3:B:505:HOH:O	1.90	1.08
1:A:171:ALA:CB	3:A:731:HOH:O	1.80	1.03
1:A:342:GLN:CB	3:A:512:HOH:O	2.08	1.01
1:B:96:ASP:OD2	1:B:120:THR:HG21	1.59	1.00
1:A:342:GLN:CG	3:A:512:HOH:O	2.06	1.00
1:A:93:GLU:HB3	3:A:542:HOH:O	0.83	0.99
1:B:291:PHE:CD2	3:B:649:HOH:O	2.19	0.96
1:B:208:LYS:HZ2	1:B:208:LYS:HB2	1.28	0.96
1:B:342:GLN:CB	3:B:506:HOH:O	2.12	0.94
1:B:58:PRO:HD2	3:B:689:HOH:O	1.65	0.94
1:B:178:GLN:HE22	1:B:314:THR:H	1.15	0.92
1:B:105:ILE:CG1	3:B:680:HOH:O	1.85	0.92
1:B:291:PHE:CG	3:B:649:HOH:O	2.23	0.91
1:A:9:ILE:HG22	1:A:36:THR:O	1.70	0.90
1:A:342:GLN:HG2	3:A:512:HOH:O	1.68	0.90
1:A:342:GLN:HB2	3:A:512:HOH:O	1.66	0.89
1:B:20:VAL:HG21	1:B:64:MET:HG2	1.55	0.88
1:A:178:GLN:HE22	1:A:314:THR:H	1.18	0.88
1:B:208:LYS:HG2	1:B:225:TYR:CE1	2.10	0.87
1:B:320:VAL:HG13	1:B:343:VAL:O	1.74	0.86
1:A:9:ILE:CG2	1:A:36:THR:O	2.25	0.84
1:A:37:LYS:HE2	3:A:726:HOH:O	1.78	0.83
1:B:105:ILE:CD1	3:B:680:HOH:O	2.20	0.82
1:B:342:GLN:HB2	3:B:506:HOH:O	1.74	0.82
1:B:343:VAL:O	3:B:505:HOH:O	1.94	0.82
1:B:208:LYS:NZ	1:B:208:LYS:HB2	1.96	0.80
1:A:148:TYR:OH	1:A:299:LYS:HE3	1.85	0.77
1:B:99:PHE:CE2	1:B:120:THR:OG1	2.36	0.76
1:B:343:VAL:HG21	3:B:535:HOH:O	1.83	0.76
1:A:240:LYS:HD3	3:A:614:HOH:O	1.85	0.75
1:A:208:LYS:HD2	1:A:209:ALA:H	1.51	0.75
1:B:334:TYR:CB	3:B:501:HOH:O	1.99	0.73
1:B:68:GLU:HB3	1:B:69:PRO:HD2	1.71	0.72
1:B:208:LYS:HG2	1:B:225:TYR:CD1	2.24	0.72
1:A:217:ASP:OD1	3:A:503:HOH:O	2.06	0.72

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:291:PHE:CD1	3:A:718:HOH:O	2.43	0.71
1:B:334:TYR:HB3	3:B:504:HOH:O	1.90	0.71
1:A:39:LYS:HD3	3:A:726:HOH:O	1.90	0.71
1:A:217:ASP:OD2	3:A:504:HOH:O	2.09	0.70
1:B:179:PHE:CE1	1:B:303:MET:HE1	2.27	0.69
1:A:304:VAL:HG21	3:A:727:HOH:O	1.91	0.69
1:A:201:LYS:NZ	1:A:208:LYS:HE2	2.08	0.68
1:A:171:ALA:N	3:A:507:HOH:O	2.27	0.67
1:B:96:ASP:OD2	1:B:120:THR:CG2	2.40	0.66
1:A:291:PHE:O	3:A:505:HOH:O	2.14	0.65
1:B:334:TYR:C	3:B:504:HOH:O	2.15	0.65
1:A:304:VAL:CG2	3:A:727:HOH:O	2.44	0.64
1:A:18:ASP:N	3:A:508:HOH:O	2.29	0.64
1:B:96:ASP:OD1	1:B:98:LYS:HG2	1.97	0.64
1:A:217:ASP:CG	3:A:503:HOH:O	2.34	0.63
1:B:291:PHE:CE2	3:B:649:HOH:O	2.47	0.63
1:A:201:LYS:HZ2	1:A:208:LYS:HE2	1.64	0.62
1:A:128:HIS:HD2	1:A:309:LYS:NZ	1.97	0.62
1:B:334:TYR:CA	3:B:501:HOH:O	2.35	0.61
1:B:208:LYS:CD	1:B:209:ALA:H	2.15	0.60
1:A:291:PHE:CG	3:A:718:HOH:O	2.53	0.60
1:B:68:GLU:HB3	1:B:69:PRO:CD	2.32	0.60
1:A:208:LYS:HE3	3:A:745:HOH:O	2.00	0.59
1:B:208:LYS:HD3	1:B:209:ALA:H	1.67	0.59
1:B:334:TYR:N	3:B:501:HOH:O	2.34	0.59
1:A:291:PHE:CE1	3:A:718:HOH:O	2.55	0.59
1:B:315:TYR:OH	3:B:503:HOH:O	1.53	0.58
1:B:334:TYR:CA	3:B:504:HOH:O	2.51	0.58
1:A:61:ARG:NH1	1:A:264:TYR:O	2.37	0.57
1:B:171:ALA:HB2	1:B:341:LYS:HG3	1.86	0.57
1:A:208:LYS:CD	1:A:209:ALA:H	2.17	0.56
1:A:20:VAL:O	1:A:65:THR:HG22	2.06	0.56
1:B:171:ALA:HB2	1:B:341:LYS:CG	2.36	0.56
1:B:342:GLN:HB3	3:B:506:HOH:O	1.87	0.55
1:B:68:GLU:CB	1:B:69:PRO:CD	2.84	0.55
1:B:20:VAL:HG21	1:B:64:MET:CG	2.34	0.54
1:B:263:GLN:NE2	3:B:507:HOH:O	2.35	0.54
1:A:315:TYR:HE2	3:A:501:HOH:O	1.91	0.53
1:A:128:HIS:HD2	1:A:309:LYS:HZ1	1.56	0.52
1:B:49:VAL:HG11	1:B:105:ILE:HD11	1.91	0.52
1:A:93:GLU:HG3	3:A:545:HOH:O	2.09	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:56:CYS:HB2	1:B:342:GLN:HB3	1.91	0.52
1:B:58:PRO:CG	3:B:701:HOH:O	2.04	0.52
1:A:39:LYS:HG2	1:A:39:LYS:O	2.08	0.52
1:A:217:ASP:HA	3:A:503:HOH:O	2.09	0.51
1:B:179:PHE:CE1	1:B:303:MET:CE	2.93	0.51
1:A:235:GLU:OE2	1:A:242:LEU:HB2	2.11	0.51
1:B:334:TYR:CB	3:B:504:HOH:O	2.56	0.50
1:B:208:LYS:CG	1:B:225:TYR:CE1	2.88	0.49
1:A:55:SER:OG	1:A:341:LYS:NZ	2.38	0.48
1:A:137:THR:O	1:A:341:LYS:HE2	2.12	0.48
1:A:268:GLU:HG2	3:A:685:HOH:O	2.13	0.48
1:B:208:LYS:HG3	1:B:209:ALA:N	2.27	0.48
1:B:348:ARG:O	1:B:349:GLU:HG3	2.13	0.48
1:B:208:LYS:CG	1:B:209:ALA:N	2.76	0.48
1:B:120:THR:OG1	1:B:120:THR:O	2.32	0.47
1:B:105:ILE:HD12	1:B:123:LEU:HD13	1.97	0.47
1:A:63:ARG:O	1:A:77:PHE:N	2.41	0.47
1:B:208:LYS:NZ	1:B:208:LYS:CB	2.54	0.47
1:B:58:PRO:HG2	3:B:710:HOH:O	2.12	0.47
1:B:24:PRO:HG2	1:B:334:TYR:CD2	2.50	0.46
1:B:342:GLN:N	3:B:506:HOH:O	2.19	0.46
1:A:68:GLU:HG3	1:A:69:PRO:HD2	1.96	0.46
1:A:18:ASP:HB2	3:A:508:HOH:O	2.15	0.46
1:B:120:THR:HG22	3:B:576:HOH:O	2.16	0.46
1:A:338:ASN:ND2	3:A:509:HOH:O	2.34	0.46
1:B:157:PRO:HB2	1:B:183:LEU:CD2	2.47	0.45
1:A:58:PRO:HB3	1:A:261:ILE:HD13	1.97	0.45
1:B:40:LEU:HG	1:B:44:SER:HB3	1.98	0.45
1:A:171:ALA:CA	3:A:507:HOH:O	2.22	0.44
1:B:208:LYS:HD3	1:B:209:ALA:N	2.33	0.44
1:B:266:ILE:HD11	3:B:536:HOH:O	2.17	0.44
1:B:191:ALA:O	1:B:211:ASN:HA	2.17	0.43
1:A:333:LEU:HB2	3:A:512:HOH:O	2.18	0.43
1:B:341:LYS:NZ	1:B:343:VAL:HG22	2.34	0.43
1:B:20:VAL:CG2	1:B:64:MET:HG2	2.38	0.43
1:A:39:LYS:CE	3:A:726:HOH:O	2.66	0.42
1:B:56:CYS:HB2	1:B:342:GLN:CG	2.50	0.42
1:A:315:TYR:HE1	3:A:731:HOH:O	2.02	0.42
1:A:240:LYS:CE	3:A:614:HOH:O	2.67	0.42
1:B:208:LYS:HA	1:B:208:LYS:HD3	1.71	0.42
1:B:20:VAL:HB	1:B:64:MET:HB3	2.02	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:320:VAL:CG1	1:A:325:SER:CB	2.97	0.42
1:A:111:TRP:CZ3	1:A:326:ALA:HB1	2.55	0.41
1:B:291:PHE:CD1	3:B:649:HOH:O	2.60	0.41
1:B:68:GLU:CG	1:B:69:PRO:HD3	2.50	0.41
1:A:320:VAL:CG1	1:A:325:SER:HB3	2.50	0.41
1:B:337:ARG:HD3	3:B:509:HOH:O	2.21	0.41
1:A:128:HIS:HE1	3:A:748:HOH:O	2.02	0.41
1:B:300:PHE:CE1	1:B:304:VAL:HG21	2.55	0.41
1:A:128:HIS:HD2	1:A:309:LYS:HZ2	1.69	0.40
1:B:235:GLU:CD	1:B:238:GLY:H	2.24	0.40
1:A:240:LYS:HD2	1:A:268:GLU:OE2	2.21	0.40
1:A:320:VAL:HG12	1:A:325:SER:HB2	2.03	0.40
1:A:171:ALA:HB2	3:A:731:HOH:O	1.83	0.40
1:B:321:GLU:OE2	1:B:348:ARG:NH2	2.50	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)
3:A:696:HOH:O	3:A:801:HOH:O[4_446]	1.75	0.45

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	335/349 (96%)	328 (98%)	5 (2%)	2 (1%)	25 5
1	B	335/349 (96%)	326 (97%)	8 (2%)	1 (0%)	41 16
All	All	670/698 (96%)	654 (98%)	13 (2%)	3 (0%)	34 11

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	68	GLU
1	A	70	GLY
1	A	69	PRO

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	283/290 (98%)	274 (97%)	9 (3%)	39 6
1	B	282/290 (97%)	274 (97%)	8 (3%)	43 8
All	All	565/580 (97%)	548 (97%)	17 (3%)	41 7

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	58	PRO
1	B	64	MET
1	B	68	GLU
1	B	121	GLU
1	B	208	LYS
1	B	341	LYS
1	B	348	ARG
1	B	349	GLU
1	A	9	ILE
1	A	39	LYS
1	A	62	SER
1	A	68	GLU
1	A	121	GLU
1	A	208	LYS
1	A	240	LYS
1	A	270	GLU
1	A	303	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	51	ASN
1	B	178	GLN
1	B	236	ASN
1	B	282	GLN
1	B	295	HIS
1	A	51	ASN
1	A	128	HIS
1	A	178	GLN
1	A	202	ASN
1	A	236	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

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	SO4	A	401	-	4,4,4	0.68	0	6,6,6	0.59	0
2	SO4	B	401	-	4,4,4	0.41	0	6,6,6	0.37	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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	339/349 (97%)	0.51	22 (6%)	18	18	13, 18, 48, 136	0
1	B	339/349 (97%)	0.49	15 (4%)	34	34	13, 23, 51, 93	0
All	All	678/698 (97%)	0.50	37 (5%)	25	24	13, 21, 50, 136	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	21	THR	7.1
1	B	269	PRO	7.1
1	A	269	PRO	6.1
1	A	21	THR	5.8
1	A	69	PRO	5.7
1	A	266	ILE	4.9
1	B	20	VAL	4.7
1	A	20	VAL	4.7
1	B	129	ILE	4.3
1	B	266	ILE	4.3
1	A	270	GLU	4.1
1	A	291	PHE	4.0
1	B	270	GLU	4.0
1	A	68	GLU	3.8
1	B	22	GLY	3.7
1	B	128	HIS	3.5
1	A	264	TYR	3.4
1	A	72	SER	3.3
1	B	69	PRO	3.3
1	A	265	ASN	3.3
1	B	121	GLU	3.1
1	B	291	PHE	3.1
1	A	22	GLY	2.9
1	B	68	GLU	2.9

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	349	GLU	2.9
1	A	67	ARG	2.8
1	A	37	LYS	2.8
1	A	65	THR	2.7
1	B	130	ASP	2.7
1	A	75	ASP	2.7
1	A	268	GLU	2.5
1	B	265	ASN	2.5
1	A	35	THR	2.3
1	B	119	SER	2.3
1	A	61	ARG	2.2
1	A	62	SER	2.0
1	A	60	MET	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)

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	SO4	A	401	5/5	0.98	0.07	18,22,24,27	0
2	SO4	B	401	5/5	0.98	0.05	20,22,26,26	0

6.5 Other polymers (i)

There are no such residues in this entry.