



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 3, 2024 – 01:29 AM EDT

PDB ID : 3I2W  
Title : Crystal structure of EFC/F-BAR domain of Drosophila Syndapin/PACSIN  
Authors : Edeling, M.A.; Owen, D.J.; Traub, L.M.  
Deposited on : 2009-06-29  
Resolution : 2.67 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

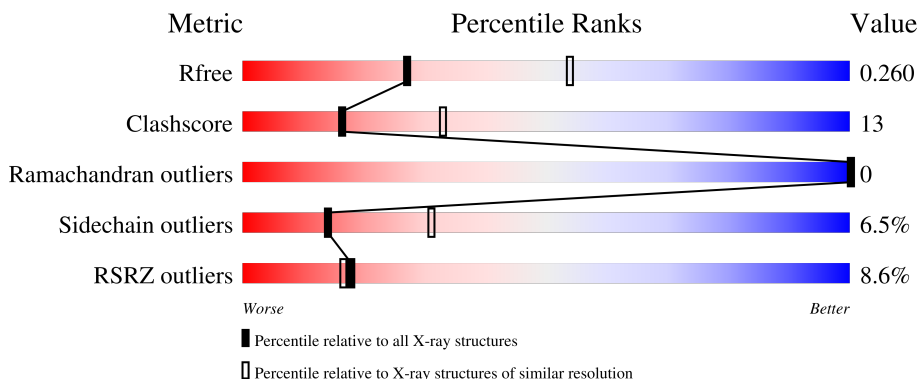
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.67 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))
$R_{free}$	164625	4708 (2.70-2.66)
Clashscore	180529	5138 (2.70-2.66)
Ramachandran outliers	177936	5071 (2.70-2.66)
Sidechain outliers	177891	5071 (2.70-2.66)
RSRZ outliers	164620	4708 (2.70-2.66)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	290	
1	B	290	

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 4731 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 Syndapin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	270	Total 2252	C 1423	N 390	O 428	S 6	Se 5	0	0	0
1	B	285	Total 2360	C 1480	N 415	O 453	S 6	Se 6	0	0	0

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	Total 6	C 3	O 3	0	0
2	B	1	Total 6	C 3	O 3	0	0

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total Na 2 2	0	0
3	B	1	Total Na 1 1	0	0

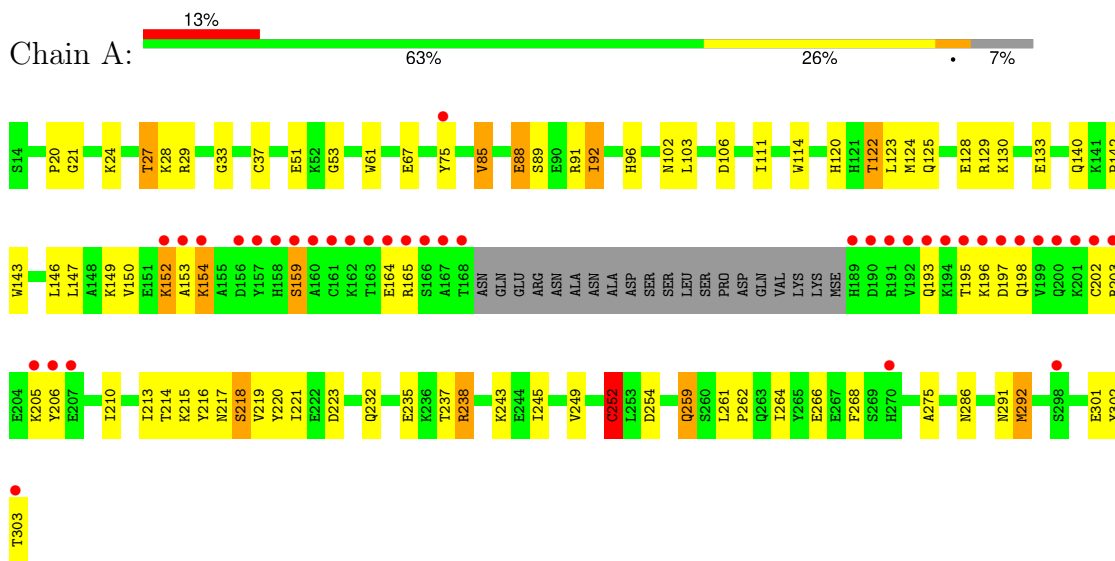
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	51	Total O 51 51	0	0
4	B	53	Total O 53 53	0	0

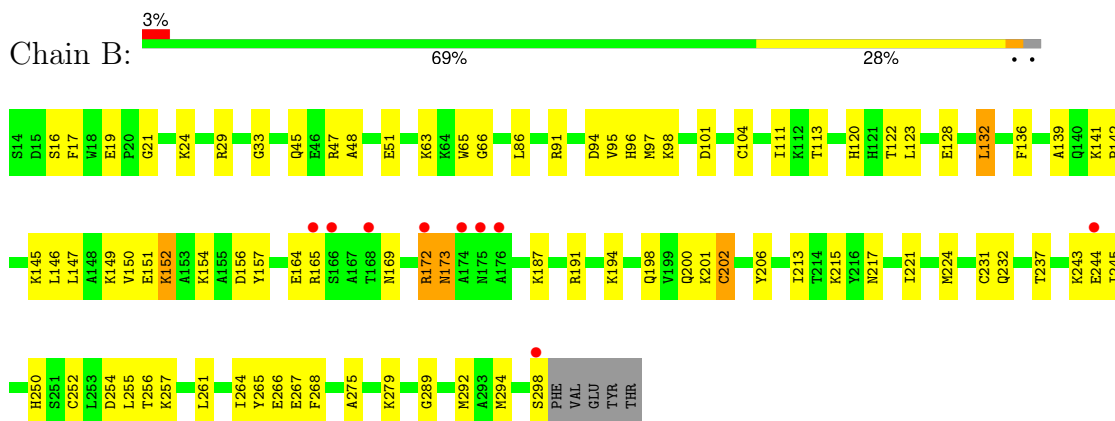
### 3 Residue-property plots [i](#)

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: Syndapin



- Molecule 1: Syndapin



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	62.59Å 85.53Å 192.86Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.07 – 2.67 39.07 – 2.67	Depositor EDS
% Data completeness (in resolution range)	99.7 (39.07-2.67) 99.7 (39.07-2.67)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.39 (at 2.69Å)	Xtrriage
Refinement program	REFMAC 5.5.0072	Depositor
R, $R_{free}$	0.234 , 0.258 0.238 , 0.260	Depositor DCC
$R_{free}$ test set	1522 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	43.9	Xtrriage
Anisotropy	0.113	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 31.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	4731	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.56% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

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	1.10	6/2296 (0.3%)	1.00	3/3080 (0.1%)
1	B	1.16	10/2403 (0.4%)	1.03	4/3222 (0.1%)
All	All	1.14	16/4699 (0.3%)	1.01	7/6302 (0.1%)

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	244	GLU	CD-OE2	9.14	1.35	1.25
1	A	252	CYS	CB-SG	-8.81	1.67	1.82
1	A	159	SER	CB-OG	8.12	1.52	1.42
1	B	244	GLU	CG-CD	6.97	1.62	1.51
1	B	252	CYS	CB-SG	-6.84	1.70	1.82
1	B	244	GLU	CD-OE1	6.64	1.32	1.25
1	A	37	CYS	CB-SG	-6.08	1.72	1.82
1	B	294	MSE	CG-SE	-5.84	1.75	1.95
1	B	202	CYS	CB-SG	-5.71	1.72	1.81
1	B	266	GLU	CD-OE2	5.52	1.31	1.25
1	A	85	VAL	CB-CG1	-5.42	1.41	1.52
1	B	65	TRP	CB-CG	-5.32	1.40	1.50
1	B	266	GLU	CD-OE1	5.26	1.31	1.25
1	B	104	CYS	CB-SG	-5.16	1.73	1.81
1	A	124	MSE	CG-SE	-5.01	1.78	1.95
1	A	292	MSE	CG-SE	-5.00	1.78	1.95

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	254	ASP	CB-CG-OD1	6.76	124.39	118.30
1	A	85	VAL	CG1-CB-CG2	-5.71	101.76	110.90
1	B	132	LEU	CA-CB-CG	-5.70	102.18	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	238	ARG	NE-CZ-NH2	-5.58	117.51	120.30
1	B	101	ASP	CB-CG-OD1	5.54	123.29	118.30
1	A	223	ASP	CB-CG-OD1	5.09	122.88	118.30
1	B	254	ASP	CB-CG-OD2	-5.03	113.78	118.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2252	0	2207	66	0
1	B	2360	0	2316	60	0
2	A	6	0	8	2	0
2	B	6	0	8	0	0
3	A	2	0	0	0	0
3	B	1	0	0	0	0
4	A	51	0	0	1	0
4	B	53	0	0	3	0
All	All	4731	0	4539	117	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 13.

All (117) 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:A:27:THR:CG2	1:A:133:GLU:OE2	2.17	0.93
1:A:29:ARG:HH22	1:A:232:GLN:HE21	1.17	0.90
1:B:29:ARG:HH22	1:B:232:GLN:HE21	1.20	0.88
1:A:27:THR:HG23	1:A:133:GLU:OE2	1.73	0.88
1:A:91:ARG:HE	1:A:264:ILE:HG12	1.37	0.88
1:B:146:LEU:HB2	1:B:213:ILE:HD12	1.61	0.82
1:B:139:ALA:CB	1:B:224:MSE:CE	2.58	0.82
1:A:152:LYS:HG2	1:A:153:ALA:N	1.95	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:169:ASN:O	1:B:172:ARG:HB3	1.83	0.78
1:A:164:GLU:OE2	1:A:196:LYS:HG2	1.83	0.78
1:B:21:GLY:O	1:B:24:LYS:HG3	1.84	0.78
1:A:20:PRO:HA	1:A:140:GLN:NE2	2.00	0.76
1:B:139:ALA:HB1	1:B:224:MSE:HE2	1.68	0.76
1:B:139:ALA:HB3	1:B:224:MSE:CE	2.16	0.75
1:B:122:THR:HG22	1:B:123:LEU:HG	1.69	0.73
1:B:139:ALA:CB	1:B:224:MSE:HE2	2.19	0.73
1:B:29:ARG:HH22	1:B:232:GLN:NE2	1.88	0.72
1:B:120:HIS:HD2	1:B:128:GLU:OE2	1.72	0.72
1:B:139:ALA:HB3	1:B:224:MSE:HE1	1.72	0.71
1:A:51:GLU:OE1	1:A:96:HIS:HD2	1.74	0.71
1:A:102:ASN:O	1:A:106:ASP:HB3	1.92	0.70
1:A:27:THR:HG21	1:A:133:GLU:OE2	1.94	0.66
1:A:20:PRO:HA	1:A:140:GLN:HE22	1.60	0.65
1:B:139:ALA:HB1	1:B:224:MSE:CE	2.24	0.65
1:A:302:TYR:HE2	1:B:165:ARG:HH11	1.43	0.65
1:A:149:LYS:O	1:A:150:VAL:C	2.32	0.64
1:A:53:GLY:HA3	2:A:1:GOL:H12	1.81	0.63
1:B:111:ILE:HD11	1:B:245:ILE:HG21	1.80	0.63
1:A:21:GLY:O	1:A:24:LYS:HG3	2.00	0.61
1:A:193:GLN:HA	1:A:196:LYS:HE2	1.81	0.61
1:A:235:GLU:OE1	1:A:238:ARG:NH2	2.32	0.61
1:A:29:ARG:HH22	1:A:232:GLN:NE2	1.96	0.60
1:B:217:ASN:O	1:B:221:ILE:HG13	2.01	0.60
1:A:286:ASN:HD22	1:A:291:ASN:HB2	1.66	0.60
1:B:146:LEU:HB2	1:B:213:ILE:CD1	2.30	0.60
1:B:152:LYS:HE2	1:B:156:ASP:OD2	2.01	0.60
1:B:132:LEU:HD23	1:B:231:CYS:SG	2.42	0.59
1:A:111:ILE:HD11	1:A:245:ILE:HG21	1.85	0.59
1:A:262:PRO:HA	1:B:256:THR:HG21	1.86	0.57
1:A:286:ASN:ND2	1:A:291:ASN:HD22	2.05	0.55
1:A:220:TYR:O	1:A:221:ILE:C	2.42	0.54
1:B:172:ARG:HG3	1:B:173:ASN:HD22	1.72	0.54
1:A:88:GLU:HG3	1:A:89:SER:N	2.23	0.53
1:B:132:LEU:HD12	1:B:132:LEU:N	2.23	0.53
1:B:172:ARG:CG	1:B:173:ASN:HD22	2.22	0.53
1:A:261:LEU:N	1:A:262:PRO:CD	2.71	0.53
1:A:125:GLN:HG3	1:A:130:LYS:NZ	2.24	0.53
1:A:61:TRP:HH2	1:A:85:VAL:HG11	1.73	0.52
1:A:235:GLU:CD	1:A:238:ARG:NH2	2.63	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:259:GLN:O	1:A:262:PRO:HD2	2.10	0.52
1:A:75:TYR:CD1	1:A:75:TYR:N	2.78	0.50
1:A:149:LYS:HA	1:A:152:LYS:HD2	1.92	0.50
1:B:33:GLY:HA3	4:B:340:HOH:O	2.12	0.50
1:B:66:GLY:HA2	1:B:86:LEU:CD1	2.41	0.50
1:A:154:LYS:HB2	1:A:206:TYR:CE1	2.47	0.50
1:A:33:GLY:HA3	4:A:342:HOH:O	2.11	0.49
1:A:125:GLN:HG3	1:A:130:LYS:HE2	1.95	0.49
1:A:120:HIS:ND1	1:A:128:GLU:OE2	2.34	0.49
1:A:154:LYS:HB2	1:A:206:TYR:HE1	1.78	0.48
1:B:51:GLU:OE1	1:B:96:HIS:HD2	1.96	0.48
1:B:45:GLN:O	1:B:48:ALA:HB3	2.14	0.48
1:A:27:THR:HG23	1:A:129:ARG:HE	1.77	0.48
1:A:164:GLU:OE2	1:A:196:LYS:CG	2.59	0.48
1:A:88:GLU:OE2	1:B:47:ARG:NH2	2.40	0.47
1:B:122:THR:O	1:B:123:LEU:C	2.51	0.47
1:B:149:LYS:O	1:B:150:VAL:C	2.49	0.47
1:B:200:GLN:O	1:B:201:LYS:C	2.52	0.47
1:A:122:THR:O	1:A:123:LEU:C	2.53	0.47
1:A:125:GLN:HG3	1:A:130:LYS:CE	2.44	0.47
1:A:165:ARG:HD3	1:A:165:ARG:HA	1.78	0.46
1:A:61:TRP:HH2	1:A:85:VAL:CG1	2.27	0.46
1:A:243:LYS:HG3	1:B:275:ALA:HB3	1.97	0.46
1:A:292:MSE:SE	1:B:17:PHE:H	2.48	0.46
1:B:198:GLN:OE1	1:B:198:GLN:HA	2.15	0.45
1:A:114:TRP:HZ2	1:A:237:THR:HG22	1.80	0.45
1:A:213:ILE:O	1:A:216:TYR:N	2.46	0.45
1:A:210:ILE:HD13	1:B:298:SER:HA	1.99	0.45
1:B:141:LYS:HB3	1:B:142:PRO:HD3	1.99	0.44
1:A:195:THR:HA	1:A:198:GLN:HB3	1.99	0.44
1:B:139:ALA:C	1:B:224:MSE:HE3	2.38	0.44
1:B:91:ARG:HB3	1:B:264:ILE:HG12	2.00	0.44
1:B:172:ARG:CG	1:B:173:ASN:ND2	2.80	0.44
1:B:122:THR:HG22	1:B:123:LEU:N	2.33	0.44
1:A:249:VAL:O	1:A:252:CYS:HB2	2.18	0.43
1:A:217:ASN:O	1:A:218:SER:C	2.56	0.43
1:B:154:LYS:HB2	1:B:206:TYR:CZ	2.53	0.43
1:B:257:LYS:HE3	4:B:352:HOH:O	2.18	0.43
1:A:152:LYS:HG2	1:A:153:ALA:H	1.80	0.43
1:B:255:LEU:HD23	1:B:255:LEU:HA	1.88	0.43
1:A:53:GLY:HA3	2:A:1:GOL:C1	2.47	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:154:LYS:HB2	1:B:206:TYR:CE1	2.53	0.43
1:A:29:ARG:NH2	1:A:232:GLN:HE21	2.00	0.43
1:A:213:ILE:CG2	1:A:214:THR:N	2.82	0.43
1:B:261:LEU:HD12	1:B:261:LEU:HA	1.65	0.43
1:B:16:SER:O	1:B:19:GLU:HB2	2.19	0.42
1:A:92:ILE:HD12	1:A:92:ILE:HA	1.76	0.42
1:A:216:TYR:O	1:A:219:VAL:N	2.47	0.42
1:B:97:MSE:HE3	4:B:334:HOH:O	2.20	0.42
1:B:157:TYR:HB2	1:B:202:CYS:HB3	2.02	0.42
1:B:136:PHE:O	1:B:224:MSE:HE1	2.20	0.42
1:B:132:LEU:CD2	1:B:231:CYS:SG	3.08	0.42
1:B:157:TYR:O	1:B:157:TYR:CG	2.73	0.41
1:B:145:LYS:O	1:B:146:LEU:C	2.58	0.41
1:B:289:GLY:O	1:B:292:MSE:HG3	2.20	0.41
1:A:142:PRO:HB2	1:A:216:TYR:CE2	2.56	0.41
1:A:20:PRO:HD3	1:A:143:TRP:HZ3	1.84	0.41
1:A:275:ALA:HB3	1:B:243:LYS:HG3	2.01	0.41
1:A:103:LEU:HD23	1:A:103:LEU:HA	1.94	0.41
1:A:146:LEU:HB2	1:A:213:ILE:HG13	2.03	0.41
1:A:254:ASP:HA	1:B:265:TYR:CE1	2.55	0.41
1:B:268:PHE:CD1	1:B:268:PHE:O	2.74	0.41
1:B:187:LYS:HE2	1:B:191:ARG:HH21	1.86	0.41
1:A:235:GLU:OE2	1:A:238:ARG:NH2	2.54	0.40
1:B:94:ASP:O	1:B:95:VAL:C	2.58	0.40
1:A:261:LEU:H	1:A:262:PRO:CD	2.35	0.40
1:B:147:LEU:O	1:B:151:GLU:HG2	2.22	0.40
1:A:268:PHE:CD2	1:B:250:HIS:HD2	2.39	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	266/290 (92%)	244 (92%)	22 (8%)	0	100	100
1	B	283/290 (98%)	261 (92%)	22 (8%)	0	100	100
All	All	549/580 (95%)	505 (92%)	44 (8%)	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	247/259 (95%)	226 (92%)	21 (8%)	8	19
1	B	260/259 (100%)	248 (95%)	12 (5%)	23	46
All	All	507/518 (98%)	474 (94%)	33 (6%)	14	31

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	THR
1	A	28	LYS
1	A	67	GLU
1	A	88	GLU
1	A	92	ILE
1	A	122	THR
1	A	147	LEU
1	A	152	LYS
1	A	154	LYS
1	A	159	SER
1	A	197	ASP
1	A	202	CYS
1	A	203	ARG
1	A	205	LYS
1	A	215	LYS
1	A	218	SER
1	A	252	CYS
1	A	259	GLN

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Mol	Chain	Res	Type
1	A	266	GLU
1	A	301	GLU
1	A	303	THR
1	B	63	LYS
1	B	98	LYS
1	B	113	THR
1	B	152	LYS
1	B	164	GLU
1	B	172	ARG
1	B	173	ASN
1	B	194	LYS
1	B	215	LYS
1	B	237	THR
1	B	267	GLU
1	B	279	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	45	GLN
1	A	96	HIS
1	A	115	GLN
1	A	198	GLN
1	A	232	GLN
1	A	250	HIS
1	A	259	GLN
1	A	274	ASN
1	A	286	ASN
1	B	96	HIS
1	B	110	GLN
1	B	120	HIS
1	B	173	ASN
1	B	200	GLN
1	B	232	GLN
1	B	248	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 3 are monoatomic - leaving 2 for Mogul analysis.

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	GOL	A	1	-	5,5,5	0.63	0	5,5,5	0.85	0
2	GOL	B	2	-	5,5,5	0.24	0	5,5,5	1.39	1 (20%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GOL	A	1	-	-	3/4/4/4	-
2	GOL	B	2	-	-	4/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2	GOL	C3-C2-C1	-2.69	101.92	111.80

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1	GOL	O1-C1-C2-C3
2	B	2	GOL	O1-C1-C2-C3
2	B	2	GOL	C1-C2-C3-O3
2	A	1	GOL	O1-C1-C2-O2
2	A	1	GOL	O2-C2-C3-O3
2	B	2	GOL	O1-C1-C2-O2
2	B	2	GOL	O2-C2-C3-O3

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1	GOL	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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	265/290 (91%)	0.52	38 (14%) <b>7</b> <b>6</b>	22, 35, 156, 174	1 (0%)
1	B	279/290 (96%)	0.02	9 (3%) 50 48	20, 32, 67, 85	0
All	All	544/580 (93%)	0.26	47 (8%) <b>18</b> <b>16</b>	20, 33, 110, 174	1 (0%)

All (47) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	191	ARG	12.8
1	A	163	THR	8.3
1	A	201	LYS	6.0
1	A	192	VAL	5.8
1	A	189	HIS	5.6
1	A	168	THR	5.5
1	A	162	LYS	5.4
1	A	303	THR	5.0
1	A	166	SER	4.8
1	B	174	ALA	4.8
1	A	198	GLN	4.7
1	B	175	ASN	4.7
1	A	206	TYR	4.6
1	A	199	VAL	4.5
1	A	195	THR	4.4
1	A	203	ARG	4.4
1	A	159	SER	4.3
1	A	158	HIS	4.1
1	A	194	LYS	4.1
1	A	160	ALA	3.9
1	A	167	ALA	3.8
1	A	205	LYS	3.8
1	A	156	ASP	3.8
1	A	270	HIS	3.7

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Mol	Chain	Res	Type	RSRZ
1	A	161	CYS	3.7
1	B	298	SER	3.6
1	A	202	CYS	3.5
1	A	164	GLU	3.4
1	A	157	TYR	3.3
1	B	244	GLU	3.2
1	A	190	ASP	3.0
1	A	200	GLN	3.0
1	A	153	ALA	3.0
1	A	154	LYS	2.9
1	A	298	SER	2.8
1	A	152	LYS	2.8
1	A	207	GLU	2.7
1	A	196	LYS	2.5
1	B	172	ARG	2.4
1	A	197	ASP	2.4
1	A	193	GLN	2.3
1	B	176	ALA	2.2
1	B	168	THR	2.2
1	B	166	SER	2.1
1	A	75	TYR	2.1
1	A	165	ARG	2.0
1	B	165	ARG	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<sup>th</sup> 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.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	NA	A	3	1/1	0.72	0.23	46,46,46,46	0
2	GOL	A	1	6/6	0.88	0.17	51,53,54,56	0
3	NA	B	304	1/1	0.92	0.07	33,33,33,33	0
2	GOL	B	2	6/6	0.95	0.09	27,32,32,35	0
3	NA	A	304	1/1	0.96	0.04	26,26,26,26	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.