



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 08:41 pm GMT

PDB ID : 2G1O
Title : Ketopiperazine-Based Renin Inhibitors: Optimization of the "C" Ring
Authors : Holsworth, D.D.; Zhanga, E.
Deposited on : 2006-02-14
Resolution : 2.70 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : trunk28620
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : recalc28949

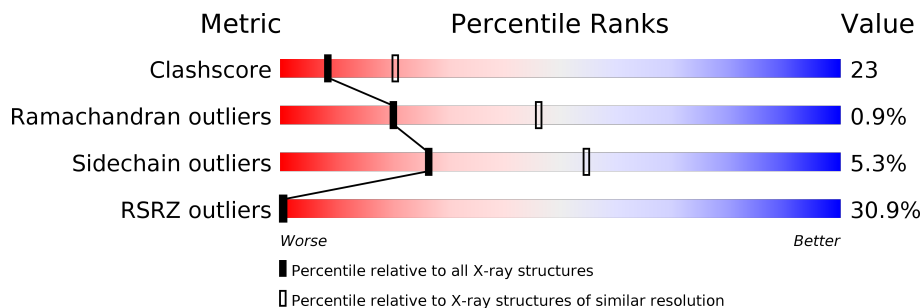
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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))
Clashscore	112137	2590 (2.70-2.70)
Ramachandran outliers	110173	2550 (2.70-2.70)
Sidechain outliers	110143	2550 (2.70-2.70)
RSRZ outliers	101464	2275 (2.70-2.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	333	<div> <div>35%</div> <div>65%</div> <div>31%</div> <div>.</div> </div>
1	B	333	<div> <div>27%</div> <div>59%</div> <div>38%</div> <div>.</div> </div>

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	NAG	B	986	-	-	X	-

2 Entry composition [i](#)

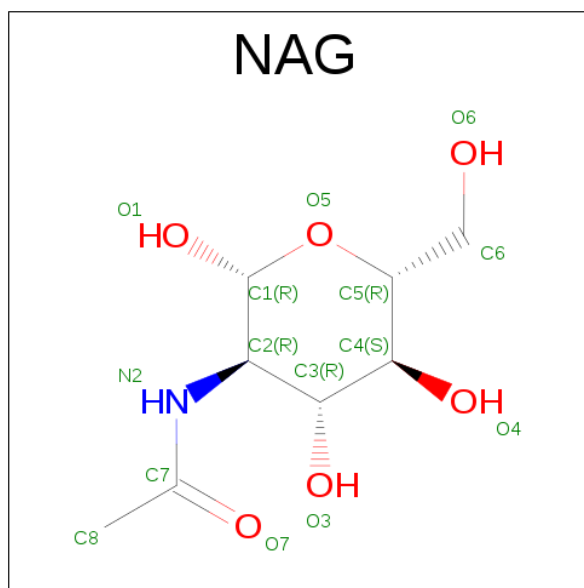
There are 4 unique types of molecules in this entry. The entry contains 5498 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Renin.

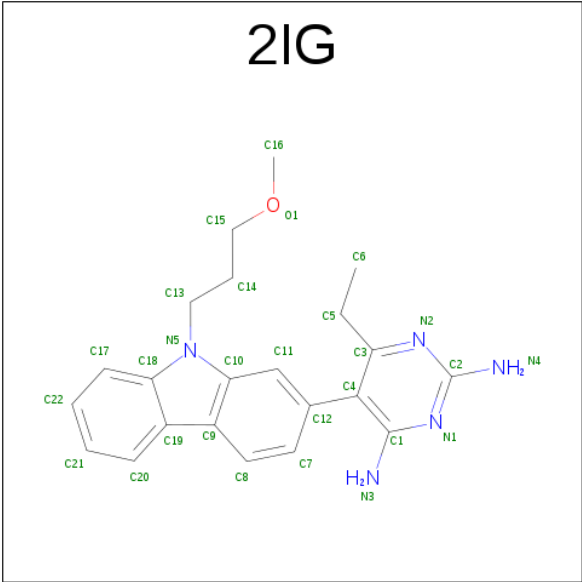
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	333	Total	C	N	O	S	0	0	0
			2572	1642	416	500	14			
1	B	333	Total	C	N	O	S	0	0	0
			2572	1642	416	500	14			

- Molecule 2 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is 6-ETHYL-5-[9-(3-METHOXYPROPYL)-9H-CARBAZOL-2-YL]PYRIMIDIN E-2,4-DIAMINE (three-letter code: 2IG) (formula: $C_{22}H_{25}N_5O$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			28	22	5	1		
3	B	1	Total	C	N	O	0	0
			28	22	5	1		

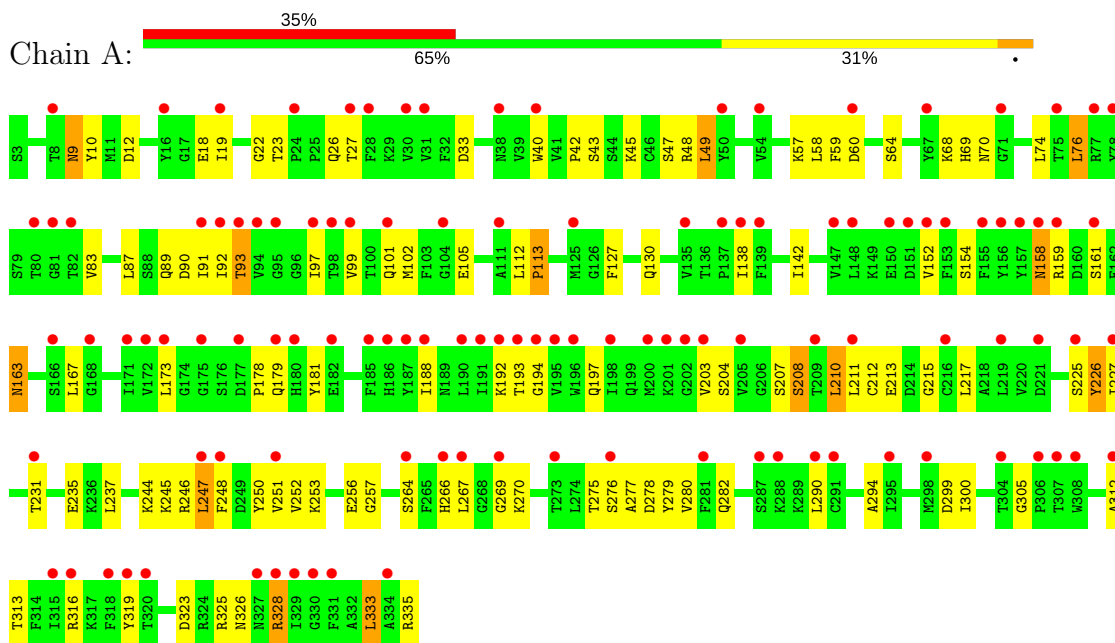
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	158	Total	O	0	0
			158	158		
4	B	112	Total	O	0	0
			112	112		

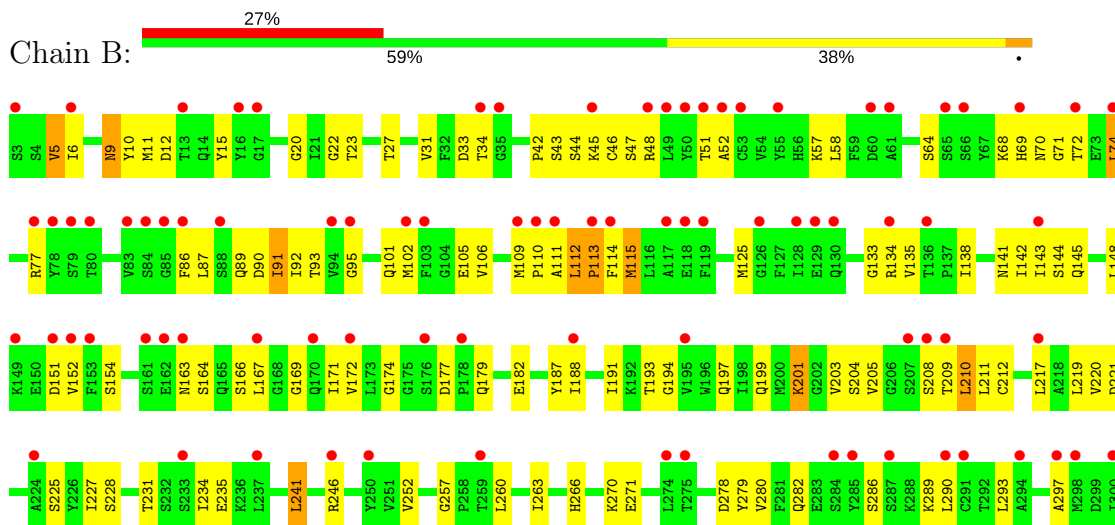
3 Residue-property plots

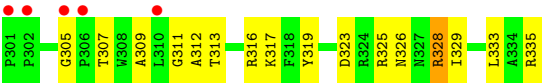
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Renin



• Molecule 1: Renin





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 3	Depositor
Cell constants a, b, c, α , β , γ	141.25Å 141.25Å 141.25Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.70 49.94 – 2.70	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.70) 94.2 (49.94-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.14 (at 2.69Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.195 , 0.251 0.202 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	DCC
Wilson B-factor (Å ²)	40.4	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 50.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.025 for l,-k,h	Xtriage
F_o, F_c correlation	0.72	EDS
Total number of atoms	5498	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 2.76% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 2IG, NAG

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	0.35	0/2632	0.66	0/3568
1	B	0.33	0/2632	0.65	0/3568
All	All	0.34	0/5264	0.66	0/7136

There are no bond length outliers.

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	2572	0	2500	112	0
1	B	2572	0	2500	125	0
2	A	14	0	13	0	0
2	B	14	0	13	7	0
3	A	28	0	25	1	0
3	B	28	0	25	2	0
4	A	158	0	0	13	0
4	B	112	0	0	17	0
All	All	5498	0	5076	237	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 23.

All (237) 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:26:GLN:HE22	1:A:60:ASP:H	1.02	0.98
1:A:87:LEU:HB3	1:A:102:MET:HE1	1.48	0.96
1:B:326:ASN:HB2	1:B:328:ARG:HD2	1.53	0.91
1:A:235:GLU:HG3	4:A:1036:HOH:O	1.72	0.90
1:B:208:SER:HB2	4:B:990:HOH:O	1.73	0.87
1:A:276:SER:O	1:A:280:VAL:HG12	1.75	0.85
1:A:275:THR:HG21	4:A:993:HOH:O	1.77	0.83
1:B:252:VAL:HG23	4:B:996:HOH:O	1.80	0.81
1:B:191:ILE:HG13	4:B:1005:HOH:O	1.80	0.80
1:B:217:LEU:HD22	4:B:1005:HOH:O	1.80	0.80
1:A:152:VAL:HG12	1:A:323:ASP:HA	1.63	0.79
1:B:48:ARG:HH12	1:B:58:LEU:HD11	1.48	0.79
1:B:210:LEU:H	1:B:210:LEU:HD23	1.46	0.78
1:A:207:SER:HB2	4:A:1079:HOH:O	1.83	0.77
1:B:227:ILE:HG13	1:B:313:THR:HB	1.68	0.76
1:B:143:ILE:HG13	4:B:1087:HOH:O	1.86	0.75
1:A:275:THR:HG22	1:A:277:ALA:H	1.52	0.75
1:B:143:ILE:HD13	1:B:148:LEU:HD12	1.70	0.74
1:B:217:LEU:HB2	1:B:307:THR:HG22	1.71	0.73
1:B:286:SER:HB3	4:B:1066:HOH:O	1.87	0.72
1:B:71:GLY:H	2:B:986:NAG:H82	1.55	0.72
1:A:43:SER:HB2	1:A:105:GLU:HB3	1.70	0.72
1:B:289:LYS:HB2	4:B:1066:HOH:O	1.90	0.72
1:B:323:ASP:HB3	1:B:328:ARG:HG2	1.73	0.71
1:B:152:VAL:HG12	1:B:323:ASP:HA	1.73	0.71
1:A:26:GLN:HE22	1:A:60:ASP:N	1.82	0.70
1:A:158:ASN:ND2	1:A:159:ARG:H	1.89	0.70
1:B:305:GLY:HA2	1:B:307:THR:HG23	1.75	0.68
1:B:191:ILE:HD11	1:B:199:GLN:HB2	1.77	0.67
1:B:5:VAL:HG13	1:B:171:ILE:HG23	1.75	0.67
1:B:70:ASN:HA	2:B:986:NAG:C8	2.24	0.66
1:A:208:SER:O	1:A:210:LEU:HD23	1.96	0.65
1:A:102:MET:HB2	4:A:1005:HOH:O	1.95	0.65
1:B:9:ASN:HD21	1:B:12:ASP:H	1.45	0.65
1:A:87:LEU:HB3	1:A:102:MET:CE	2.26	0.65
1:B:48:ARG:HH22	1:B:58:LEU:HD13	1.63	0.64
1:B:6:ILE:HG23	1:B:167:LEU:CD1	2.26	0.64
1:A:9:ASN:HD21	1:A:12:ASP:H	1.45	0.64
1:A:226:TYR:HB3	1:A:294:ALA:O	1.98	0.63
1:B:112:LEU:HD23	1:B:113:PRO:HA	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:42:PRO:HG3	1:B:109:MET:HE1	1.79	0.62
1:A:130:GLN:HG3	4:A:1061:HOH:O	1.99	0.62
1:B:9:ASN:C	1:B:9:ASN:HD22	2.02	0.62
1:B:326:ASN:CB	1:B:328:ARG:HD2	2.28	0.62
1:B:197:GLN:OE1	1:B:307:THR:HG21	1.99	0.61
1:A:179:GLN:O	1:A:335:ARG:HD2	2.00	0.61
1:A:323:ASP:OD1	1:A:328:ARG:HD2	2.00	0.61
1:B:210:LEU:H	1:B:210:LEU:CD2	2.14	0.61
1:B:48:ARG:HH22	1:B:58:LEU:CD1	2.13	0.61
1:A:18:GLU:HG3	4:A:1131:HOH:O	1.99	0.61
1:A:9:ASN:HD22	1:A:9:ASN:C	2.04	0.61
1:A:163:ASN:HD22	1:A:163:ASN:H	1.49	0.60
1:B:220:VAL:HG21	1:B:329:ILE:HD13	1.83	0.60
1:A:300:ILE:O	1:A:305:GLY:HA3	2.01	0.60
1:A:161:SER:OG	1:A:163:ASN:ND2	2.36	0.59
1:B:5:VAL:HG13	1:B:171:ILE:CG2	2.32	0.59
1:B:225:SER:O	1:B:312:ALA:HB3	2.04	0.58
1:A:154:SER:HB3	1:A:319:TYR:CE1	2.38	0.58
1:A:253:LYS:HD2	1:A:256:GLU:OE2	2.03	0.58
1:B:203:VAL:HB	1:B:211:LEU:HB2	1.85	0.58
1:A:192:LYS:NZ	1:A:193:THR:O	2.36	0.57
1:B:142:ILE:O	1:B:145:GLN:HG2	2.04	0.57
1:B:323:ASP:OD1	1:B:328:ARG:HD3	2.04	0.57
1:A:45:LYS:HD2	4:A:1135:HOH:O	2.03	0.57
1:A:158:ASN:HD22	1:A:159:ARG:H	1.50	0.57
1:A:9:ASN:HD22	1:A:10:TYR:N	2.02	0.57
1:A:68:LYS:HB2	1:A:89:GLN:HB3	1.86	0.57
1:B:151:ASP:CB	4:B:995:HOH:O	2.53	0.57
1:B:69:HIS:HA	4:B:1014:HOH:O	2.04	0.57
1:A:266:HIS:HE1	1:A:269:GLY:HA2	1.71	0.56
1:B:182:GLU:HG2	1:B:335:ARG:HD3	1.88	0.56
1:B:52:ALA:HA	1:B:115:MET:HE2	1.88	0.56
1:B:231:THR:O	1:B:235:GLU:HG3	2.04	0.56
1:B:11:MET:O	1:B:12:ASP:HB2	2.06	0.56
1:A:325:ARG:HD2	4:A:1037:HOH:O	2.06	0.56
1:B:43:SER:O	1:B:58:LEU:HD22	2.04	0.55
1:B:111:ALA:O	1:B:115:MET:HB2	2.06	0.55
1:A:244:LYS:HB3	4:A:1108:HOH:O	2.07	0.55
1:B:45:LYS:HD2	1:B:86:PHE:HZ	1.70	0.55
1:B:106:VAL:HG11	1:B:109:MET:HE2	1.89	0.54
1:B:33:ASP:OD1	3:B:886:2IG:N2	2.39	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:LYS:HE3	1:B:266:HIS:CD2	2.42	0.54
1:B:217:LEU:HB2	1:B:307:THR:CG2	2.37	0.54
1:B:9:ASN:HD22	1:B:10:TYR:N	2.05	0.54
1:B:71:GLY:N	2:B:986:NAG:H82	2.23	0.54
1:A:163:ASN:ND2	1:A:163:ASN:O	2.41	0.53
1:B:266:HIS:HB2	4:B:988:HOH:O	2.08	0.53
1:B:9:ASN:C	1:B:9:ASN:ND2	2.62	0.53
1:B:15:TYR:O	1:B:31:VAL:HG22	2.08	0.53
1:B:151:ASP:HB2	4:B:995:HOH:O	2.07	0.53
1:B:33:ASP:HB2	3:B:886:2IG:H62	1.91	0.53
1:A:197:GLN:CD	1:A:217:LEU:HD23	2.28	0.53
1:B:43:SER:HB2	1:B:105:GLU:HB3	1.90	0.53
1:A:231:THR:O	1:A:235:GLU:HG2	2.09	0.52
1:B:167:LEU:HD11	1:B:169:GLY:O	2.10	0.52
1:A:247:LEU:HD22	1:A:248:PHE:CE2	2.45	0.52
1:B:228:SER:OG	1:B:309:ALA:HB3	2.09	0.52
1:A:227:ILE:HG13	1:A:313:THR:HB	1.92	0.51
1:B:148:LEU:HD22	1:B:174:GLY:HA3	1.91	0.51
1:B:280:VAL:HG22	1:B:293:LEU:HD22	1.92	0.51
1:B:70:ASN:HA	2:B:986:NAG:H81	1.92	0.51
1:A:275:THR:CG2	1:A:276:SER:N	2.74	0.51
1:A:87:LEU:HD13	1:A:102:MET:HE1	1.93	0.51
1:B:154:SER:HB3	1:B:319:TYR:CE1	2.46	0.51
1:B:113:PRO:O	1:B:115:MET:N	2.44	0.51
1:B:289:LYS:HD2	4:B:1066:HOH:O	2.09	0.51
1:A:188:ILE:CD1	1:A:267:LEU:HB3	2.41	0.51
1:A:212:CYS:SG	1:A:212:CYS:O	2.69	0.50
1:B:193:THR:HG22	1:B:194:GLY:N	2.26	0.50
1:A:158:ASN:ND2	1:A:159:ARG:N	2.59	0.50
1:B:71:GLY:H	2:B:986:NAG:C8	2.21	0.50
1:B:20:GLY:O	1:B:92:ILE:HA	2.12	0.50
1:A:159:ARG:HB3	4:A:1050:HOH:O	2.12	0.50
1:B:177:ASP:OD1	1:B:179:GLN:HB2	2.10	0.50
1:B:187:TYR:HD2	1:B:328:ARG:HG3	1.77	0.50
1:B:101:GLN:NE2	1:B:138:ILE:HA	2.27	0.50
1:B:141:ASN:O	1:B:144:SER:HB2	2.12	0.50
1:A:92:ILE:HD12	1:A:101:GLN:HB3	1.93	0.50
1:B:205:VAL:HB	1:B:210:LEU:HD21	1.94	0.50
1:A:9:ASN:ND2	1:A:9:ASN:C	2.65	0.49
1:A:74:LEU:HD13	1:A:87:LEU:HD21	1.95	0.49
1:A:237:LEU:C	1:A:237:LEU:HD23	2.32	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:TYR:CD2	1:B:328:ARG:HG3	2.47	0.49
1:A:188:ILE:HD13	1:A:267:LEU:HB3	1.95	0.49
1:B:112:LEU:HD23	1:B:113:PRO:CA	2.42	0.49
1:B:44:SER:C	1:B:46:CYS:H	2.15	0.49
1:A:33:ASP:OD1	3:A:885:2IG:N2	2.46	0.48
1:A:204:SER:OG	1:A:264:SER:HB2	2.14	0.48
1:B:27:THR:O	1:B:57:LYS:HD3	2.12	0.48
1:A:99:VAL:HG11	1:A:142:ILE:HG12	1.96	0.48
1:B:9:ASN:HD21	1:B:12:ASP:N	2.10	0.48
1:B:9:ASN:ND2	1:B:12:ASP:H	2.10	0.48
1:B:270:LYS:HG2	4:B:1095:HOH:O	2.14	0.48
1:A:275:THR:O	1:A:278:ASP:HB2	2.14	0.47
1:A:275:THR:HG22	1:A:276:SER:N	2.29	0.47
1:B:69:HIS:CG	1:B:70:ASN:N	2.81	0.47
1:B:280:VAL:HG22	1:B:293:LEU:CD2	2.45	0.47
1:B:209:THR:O	1:B:209:THR:HG22	2.14	0.47
1:B:5:VAL:HG23	4:B:1004:HOH:O	2.14	0.47
1:A:9:ASN:HD21	1:A:12:ASP:N	2.12	0.47
1:B:70:ASN:HA	2:B:986:NAG:H82	1.96	0.47
1:A:192:LYS:HD2	1:A:193:THR:H	1.80	0.47
1:A:22:GLY:HA2	1:A:90:ASP:OD2	2.14	0.47
1:A:247:LEU:HD22	1:A:248:PHE:CD2	2.50	0.46
1:B:133:GLY:C	1:B:134:ARG:HG3	2.35	0.46
1:A:127:PHE:CB	1:A:194:GLY:HA2	2.45	0.46
1:B:217:LEU:HD12	1:B:307:THR:HG22	1.98	0.46
1:B:51:THR:O	1:B:115:MET:HE3	2.15	0.46
1:A:203:VAL:HG23	1:A:212:CYS:HB3	1.96	0.46
1:B:143:ILE:CD1	1:B:148:LEU:HD12	2.42	0.46
1:A:26:GLN:NE2	1:A:59:PHE:HA	2.30	0.46
1:A:167:LEU:H	1:A:167:LEU:HD23	1.80	0.46
1:A:257:GLY:HA3	1:A:282:GLN:HE22	1.80	0.46
1:B:110:PRO:O	1:B:111:ALA:C	2.54	0.46
1:B:77:ARG:HH11	1:B:77:ARG:HG2	1.81	0.46
1:A:213:GLU:C	1:A:215:GLY:H	2.19	0.46
1:A:87:LEU:CB	1:A:102:MET:HE1	2.34	0.45
1:B:210:LEU:HD13	4:B:990:HOH:O	2.15	0.45
1:B:212:CYS:O	1:B:212:CYS:SG	2.74	0.45
1:B:278:ASP:OD1	1:B:317:LYS:HD3	2.16	0.45
1:B:45:LYS:HD2	1:B:86:PHE:CZ	2.49	0.45
1:A:27:THR:O	1:A:57:LYS:HG2	2.17	0.45
1:B:113:PRO:C	1:B:115:MET:H	2.20	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:271:GLU:HG2	4:B:1043:HOH:O	2.15	0.45
1:B:74:LEU:O	1:B:74:LEU:HD12	2.17	0.45
1:A:97:ILE:HD13	1:A:142:ILE:HG23	1.99	0.45
1:A:192:LYS:NZ	1:A:193:THR:CG2	2.80	0.45
1:B:188:ILE:HD12	1:B:188:ILE:N	2.32	0.45
1:A:225:SER:O	1:A:312:ALA:HB3	2.15	0.45
1:B:221:ASP:O	1:B:311:GLY:HA2	2.17	0.45
1:A:163:ASN:H	1:A:163:ASN:ND2	2.11	0.45
1:A:40:TRP:CD1	1:A:76:LEU:HD23	2.52	0.44
1:A:42:PRO:HB2	1:A:58:LEU:HD23	1.98	0.44
1:B:89:GLN:HB2	1:B:102:MET:SD	2.56	0.44
1:A:245:LYS:HD2	1:A:250:TYR:OH	2.18	0.44
1:A:101:GLN:NE2	1:A:138:ILE:HA	2.33	0.44
1:A:9:ASN:ND2	1:A:12:ASP:H	2.13	0.44
1:B:52:ALA:HB3	1:B:109:MET:HB3	1.99	0.44
1:A:235:GLU:HB3	4:A:1143:HOH:O	2.17	0.44
1:A:192:LYS:HD2	1:A:193:THR:N	2.33	0.44
1:B:260:LEU:HB3	1:B:279:TYR:OH	2.18	0.44
1:B:312:ALA:O	1:B:316:ARG:HB2	2.17	0.44
1:B:77:ARG:NH1	1:B:77:ARG:HG2	2.33	0.44
1:A:163:ASN:ND2	1:A:163:ASN:N	2.66	0.44
1:A:211:LEU:HD11	1:A:237:LEU:HB2	2.00	0.43
1:B:134:ARG:CZ	2:B:986:NAG:H61	2.47	0.43
1:A:49:LEU:HD12	1:A:49:LEU:HA	1.77	0.43
1:B:208:SER:O	1:B:210:LEU:HD22	2.19	0.43
1:B:22:GLY:HA2	1:B:90:ASP:OD1	2.18	0.43
1:A:231:THR:N	1:A:299:ASP:OD2	2.45	0.43
1:A:163:ASN:HD22	1:A:163:ASN:N	2.09	0.43
1:A:69:HIS:CG	1:A:70:ASN:N	2.87	0.43
1:A:22:GLY:HA2	1:A:90:ASP:CG	2.39	0.43
1:B:91:ILE:O	1:B:91:ILE:HG13	2.18	0.43
1:A:112:LEU:HA	1:A:113:PRO:HA	1.81	0.43
1:B:71:GLY:O	1:B:72:THR:C	2.58	0.43
1:B:70:ASN:O	1:B:87:LEU:O	2.36	0.43
1:B:87:LEU:HD11	1:B:135:VAL:HG21	2.01	0.43
1:A:97:ILE:HD13	1:A:142:ILE:CG2	2.49	0.42
1:A:251:VAL:HG21	1:A:290:LEU:HD13	2.01	0.42
1:A:333:LEU:HA	1:A:333:LEU:HD23	1.81	0.42
1:B:151:ASP:HB3	1:B:325:ARG:HB2	1.99	0.42
1:A:266:HIS:CE1	1:A:269:GLY:HA2	2.52	0.42
1:B:234:ILE:HG13	1:B:297:ALA:HA	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:THR:HG23	4:A:1112:HOH:O	2.18	0.42
1:A:87:LEU:HD13	1:A:102:MET:CE	2.50	0.42
1:B:172:VAL:HG23	4:B:1013:HOH:O	2.19	0.42
1:A:192:LYS:NZ	1:A:193:THR:HG22	2.34	0.42
1:A:246:ARG:HB3	1:A:247:LEU:H	1.75	0.42
1:A:26:GLN:NE2	1:A:60:ASP:H	1.87	0.42
1:A:101:GLN:HG3	1:A:102:MET:N	2.35	0.42
1:A:158:ASN:HD22	1:A:159:ARG:N	2.18	0.42
1:B:23:THR:O	1:B:64:SER:HA	2.19	0.42
1:A:48:ARG:HD3	1:A:48:ARG:HA	1.79	0.41
1:B:164:SER:OG	1:B:166:SER:HB2	2.20	0.41
1:B:220:VAL:CG2	1:B:329:ILE:HD13	2.49	0.41
1:A:326:ASN:HB2	1:A:328:ARG:CG	2.50	0.41
1:A:90:ASP:OD2	1:A:91:ILE:N	2.50	0.41
1:B:20:GLY:O	1:B:93:THR:N	2.44	0.41
1:A:19:ILE:HG13	1:A:19:ILE:O	2.21	0.41
1:B:241:LEU:HD12	1:B:241:LEU:HA	1.90	0.41
1:A:325:ARG:C	1:A:326:ASN:HD22	2.25	0.41
1:B:204:SER:O	1:B:263:ILE:HA	2.21	0.41
1:A:159:ARG:CZ	4:A:1115:HOH:O	2.69	0.41
1:A:102:MET:HB3	1:A:102:MET:HE2	1.70	0.40
1:B:34:THR:HA	1:B:125:MET:HB2	2.03	0.40
1:B:257:GLY:HA3	1:B:282:GLN:HE22	1.85	0.40
1:A:313:THR:HA	1:A:316:ARG:NH2	2.35	0.40
1:A:76:LEU:HB2	1:A:83:VAL:HG23	2.02	0.40
1:A:178:PRO:HA	1:A:181:TYR:CE1	2.56	0.40
1:A:127:PHE:CG	1:A:194:GLY:HA2	2.57	0.40
1:A:23:THR:O	1:A:64:SER:HA	2.22	0.40
1:B:9:ASN:HD21	1:B:12:ASP:HA	1.87	0.40
1:A:276:SER:HA	1:A:279:TYR:CE2	2.57	0.40
1:A:47:SER:OG	1:A:49:LEU:HB2	2.22	0.40
1:A:91:ILE:HG13	1:A:91:ILE:O	2.21	0.40
1:B:48:ARG:NH1	1:B:58:LEU:HD11	2.27	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	331/333 (99%)	306 (92%)	23 (7%)	2 (1%)	28	56
1	B	331/333 (99%)	303 (92%)	24 (7%)	4 (1%)	15	37
All	All	662/666 (99%)	609 (92%)	47 (7%)	6 (1%)	20	46

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	208	SER
1	B	114	PHE
1	A	270	LYS
1	B	246	ARG
1	B	47	SER
1	B	95	GLY

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	284/284 (100%)	270 (95%)	14 (5%)	29	58
1	B	284/284 (100%)	268 (94%)	16 (6%)	25	51
All	All	568/568 (100%)	538 (95%)	30 (5%)	26	54

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

Mol	Chain	Res	Type
1	A	9	ASN
1	A	49	LEU
1	A	76	LEU
1	A	93	THR
1	A	113	PRO
1	A	158	ASN
1	A	163	ASN
1	A	173	LEU
1	A	210	LEU
1	A	226	TYR
1	A	247	LEU
1	A	252	VAL
1	A	328	ARG
1	A	333	LEU
1	B	5	VAL
1	B	9	ASN
1	B	68	LYS
1	B	74	LEU
1	B	91	ILE
1	B	112	LEU
1	B	113	PRO
1	B	115	MET
1	B	163	ASN
1	B	201	LYS
1	B	210	LEU
1	B	219	LEU
1	B	241	LEU
1	B	290	LEU
1	B	328	ARG
1	B	333	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	ASN
1	A	26	GLN
1	A	101	GLN
1	A	141	ASN
1	A	145	GLN
1	A	158	ASN
1	A	163	ASN
1	A	189	ASN
1	A	199	GLN

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Mol	Chain	Res	Type
1	A	266	HIS
1	A	282	GLN
1	A	296	HIS
1	A	326	ASN
1	B	9	ASN
1	B	26	GLN
1	B	56	HIS
1	B	101	GLN
1	B	141	ASN
1	B	145	GLN
1	B	186	HIS
1	B	189	ASN
1	B	266	HIS
1	B	327	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

4 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
3	2IG	A	885	-	28,31,31	1.39	4 (14%)	34,44,44	1.61	5 (14%)
2	NAG	A	985	1	14,14,15	0.50	0	15,19,21	0.82	1 (6%)
3	2IG	B	886	-	28,31,31	1.39	5 (17%)	34,44,44	1.62	6 (17%)
2	NAG	B	986	1	14,14,15	0.71	1 (7%)	15,19,21	0.64	0

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
3	2IG	A	885	-	-	0/11/11/11	0/4/4/4
2	NAG	A	985	1	-	0/6/23/26	0/1/1/1
3	2IG	B	886	-	-	0/11/11/11	0/4/4/4
2	NAG	B	986	1	-	0/6/23/26	0/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	986	NAG	C1-C2	2.17	1.55	1.52
3	B	886	2IG	C22-C21	2.17	1.43	1.38
3	B	886	2IG	C7-C12	2.18	1.44	1.39
3	A	885	2IG	C22-C21	2.31	1.43	1.38
3	B	886	2IG	C22-C17	2.53	1.42	1.36
3	A	885	2IG	C22-C17	2.83	1.43	1.36
3	A	885	2IG	C21-C20	2.93	1.43	1.36
3	B	886	2IG	C21-C20	3.01	1.43	1.36
3	B	886	2IG	C8-C7	4.13	1.45	1.36
3	A	885	2IG	C8-C7	4.15	1.45	1.36

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	886	2IG	C4-C3-N2	-3.23	119.66	123.71
3	A	885	2IG	C4-C3-N2	-3.17	119.74	123.71
3	A	885	2IG	C11-C12-C4	-3.09	113.25	121.55
3	B	886	2IG	C11-C12-C4	-2.82	113.97	121.55
2	A	985	NAG	C2-N2-C7	-2.10	119.89	122.94
3	B	886	2IG	C7-C8-C9	-2.03	118.76	121.60
3	B	886	2IG	C4-C1-N1	2.47	123.88	122.49
3	A	885	2IG	C4-C1-N1	2.48	123.89	122.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	886	2IG	C7-C12-C4	4.11	127.66	120.79
3	A	885	2IG	C7-C12-C4	4.45	128.22	120.79
3	A	885	2IG	C2-N2-C3	5.11	120.26	116.31
3	B	886	2IG	C2-N2-C3	5.34	120.44	116.31

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	885	2IG	1	0
3	B	886	2IG	2	0
2	B	986	NAG	7	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, 95th 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	333/333 (100%)	1.74	116 (34%) 0 0	18, 34, 55, 80	0
1	B	333/333 (100%)	1.53	90 (27%) 1 0	21, 42, 71, 92	0
All	All	666/666 (100%)	1.63	206 (30%) 0 0	18, 37, 66, 92	0

All (206) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	79	SER	5.1
1	B	134	ARG	5.0
1	A	188	ILE	4.9
1	A	99	VAL	4.7
1	A	247	LEU	4.5
1	A	191	ILE	4.4
1	B	53	CYS	4.4
1	B	52	ALA	4.2
1	A	180	HIS	4.2
1	B	55	TYR	4.2
1	B	209	THR	4.1
1	A	200	MET	4.0
1	A	19	ILE	4.0
1	A	193	THR	3.9
1	A	205	VAL	3.9
1	A	97	ILE	3.9
1	B	208	SER	3.9
1	B	77	ARG	3.8
1	B	49	LEU	3.7
1	A	209	THR	3.7
1	B	48	ARG	3.7
1	A	157	TYR	3.7
1	A	93	THR	3.7
1	B	51	THR	3.6

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Mol	Chain	Res	Type	RSRZ
1	A	331	PHE	3.6
1	A	329	ILE	3.6
1	B	294	ALA	3.5
1	A	306	PRO	3.5
1	A	248	PHE	3.4
1	B	78	TYR	3.4
1	B	95	GLY	3.4
1	B	114	PHE	3.4
1	A	38	ASN	3.4
1	A	334	ALA	3.4
1	B	306	PRO	3.4
1	A	186	HIS	3.4
1	A	175	GLY	3.4
1	B	162	GLU	3.4
1	A	30	VAL	3.4
1	B	161	SER	3.3
1	B	80	THR	3.3
1	B	61	ALA	3.3
1	A	82	THR	3.3
1	A	31	VAL	3.3
1	A	111	ALA	3.2
1	B	66	SER	3.2
1	A	187	TYR	3.2
1	A	71	GLY	3.2
1	B	300	ILE	3.2
1	A	211	LEU	3.2
1	B	84	SER	3.2
1	B	3	SER	3.1
1	B	274	LEU	3.1
1	A	78	TYR	3.0
1	A	153	PHE	3.0
1	A	269	GLY	3.0
1	A	151	ASP	3.0
1	A	171	ILE	3.0
1	A	330	GLY	3.0
1	B	83	VAL	3.0
1	A	94	VAL	3.0
1	A	92	ILE	3.0
1	B	172	VAL	2.9
1	A	182	GLU	2.9
1	A	290	LEU	2.9
1	A	173	LEU	2.8

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Mol	Chain	Res	Type	RSRZ
1	B	275	THR	2.8
1	A	147	VAL	2.8
1	A	137	PRO	2.8
1	B	310	LEU	2.8
1	A	190	LEU	2.8
1	B	178	PRO	2.8
1	B	152	VAL	2.8
1	B	119	PHE	2.8
1	A	320	THR	2.8
1	A	91	ILE	2.8
1	A	75	THR	2.8
1	A	319	TYR	2.8
1	B	207	SER	2.7
1	A	194	GLY	2.7
1	B	50	TYR	2.7
1	B	128	ILE	2.7
1	A	135	VAL	2.7
1	B	69	HIS	2.7
1	A	8	THR	2.7
1	A	125	MET	2.7
1	A	195	VAL	2.7
1	B	291	CYS	2.7
1	A	40	TRP	2.7
1	A	225	SER	2.6
1	B	233	SER	2.6
1	B	117	ALA	2.6
1	A	221	ASP	2.6
1	A	315	ILE	2.6
1	A	67	TYR	2.6
1	A	24	PRO	2.6
1	A	60	ASP	2.6
1	A	177	ASP	2.6
1	B	176	SER	2.6
1	A	231	THR	2.5
1	B	16	TYR	2.5
1	B	237	LEU	2.5
1	A	312	ALA	2.5
1	A	288	LYS	2.5
1	B	102	MET	2.5
1	B	284	SER	2.5
1	A	27	THR	2.5
1	A	148	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	86	PHE	2.5
1	B	72	THR	2.5
1	B	151	ASP	2.5
1	B	111	ALA	2.5
1	B	285	TYR	2.5
1	B	143	ILE	2.5
1	B	110	PRO	2.5
1	B	297	ALA	2.5
1	B	287	SER	2.5
1	A	80	THR	2.4
1	A	138	ILE	2.4
1	A	198	ILE	2.4
1	A	155	PHE	2.4
1	A	179	GLN	2.4
1	B	13	THR	2.4
1	B	136	THR	2.4
1	A	295	ILE	2.4
1	A	219	LEU	2.4
1	A	150	GLU	2.4
1	A	276	SER	2.4
1	A	327	ASN	2.4
1	A	161	SER	2.4
1	B	126	GLY	2.4
1	A	291	CYS	2.4
1	B	74	LEU	2.4
1	A	156	TYR	2.4
1	A	104	GLY	2.4
1	B	34	THR	2.4
1	B	217	LEU	2.4
1	A	318	PHE	2.4
1	A	266	HIS	2.3
1	A	304	THR	2.3
1	B	60	ASP	2.3
1	A	281	PHE	2.3
1	A	267	LEU	2.3
1	B	246	ARG	2.3
1	A	28	PHE	2.3
1	A	216	CYS	2.3
1	A	168	GLY	2.3
1	B	45	LYS	2.3
1	B	94	VAL	2.3
1	B	103	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	85	GLY	2.3
1	B	195	VAL	2.3
1	A	298	MET	2.3
1	B	259	THR	2.3
1	A	201	LYS	2.3
1	B	6	ILE	2.3
1	A	152	VAL	2.3
1	B	17	GLY	2.2
1	A	158	ASN	2.2
1	A	308	TRP	2.2
1	A	287	SER	2.2
1	B	167	LEU	2.2
1	B	129	GLU	2.2
1	A	54	VAL	2.2
1	A	192	LYS	2.2
1	A	166	SER	2.2
1	A	196	TRP	2.2
1	A	101	GLN	2.2
1	A	273	THR	2.2
1	A	50	TYR	2.2
1	A	185	PHE	2.2
1	A	328	ARG	2.2
1	A	203	VAL	2.2
1	B	88	SER	2.2
1	B	188	ILE	2.2
1	A	227	ILE	2.1
1	A	307	THR	2.1
1	A	264	SER	2.1
1	A	16	TYR	2.1
1	A	81	GLY	2.1
1	B	118	GLU	2.1
1	B	224	ALA	2.1
1	B	109	MET	2.1
1	B	130	GLN	2.1
1	B	153	PHE	2.1
1	A	172	VAL	2.1
1	B	290	LEU	2.1
1	B	298	MET	2.1
1	A	77	ARG	2.1
1	A	95	GLY	2.1
1	A	202	GLY	2.1
1	B	301	PRO	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	302	PRO	2.1
1	B	163	ASN	2.1
1	A	159	ARG	2.1
1	B	65	SER	2.1
1	B	113	PRO	2.1
1	B	35	GLY	2.1
1	B	305	GLY	2.1
1	B	170	GLN	2.1
1	B	250	TYR	2.1
1	A	98	THR	2.0
1	A	139	PHE	2.0
1	A	251	VAL	2.0
1	B	149	LYS	2.0
1	A	316	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th 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	LLDF	B-factors(Å ²)	Q<0.9
3	2IG	A	885	28/28	0.81	0.33	0.60	24,25,30,31	0
3	2IG	B	886	28/28	0.79	0.32	0.22	34,45,47,48	0
2	NAG	B	986	14/15	0.55	0.37	0.21	78,80,81,81	0
2	NAG	A	985	14/15	0.72	0.28	-	44,48,51,52	0

6.5 Other polymers [i](#)

There are no such residues in this entry.