



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 08:01 pm GMT

PDB ID : 3BV7  
Title : Crystal structure of Delta(4)-3-ketosteroid 5-beta-reductase in complex with NADP and glycerol. Resolution: 1.79 Å.  
Authors : Di Costanzo, L.; Drury, J.; Penning, T.M.; Christianson, D.W.  
Deposited on : 2008-01-04  
Resolution : 1.79 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

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

with specific help available everywhere you see the ⓘ symbol.

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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	:	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

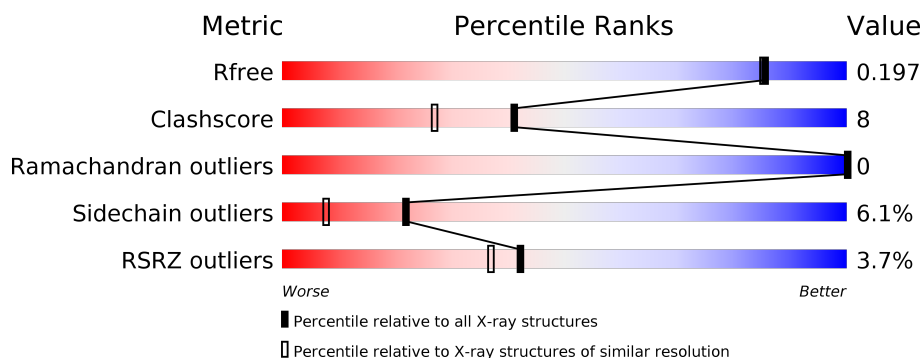
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.79 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))
$R_{free}$	100719	4827 (1.80-1.80)
Clashscore	112137	5742 (1.80-1.80)
Ramachandran outliers	110173	5676 (1.80-1.80)
Sidechain outliers	110143	5675 (1.80-1.80)
RSRZ outliers	101464	4906 (1.80-1.80)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	326	<div> <div style="width: 100%; height: 10px; background-color: red; position: relative;"> <span style="position: absolute; top: -5px; left: 0;">%</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>82%</span> <span>16%</span> <span>•</span> </div> </div>
1	B	326	<div> <div style="width: 100%; height: 10px; background-color: red; position: relative;"> <span style="position: absolute; top: -5px; left: 0;">6%</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>78%</span> <span>18%</span> <span>• •</span> </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
3	GOL	A	3991	-	-	-	X
3	GOL	A	3999	-	-	-	X

## 2 Entry composition [i](#)

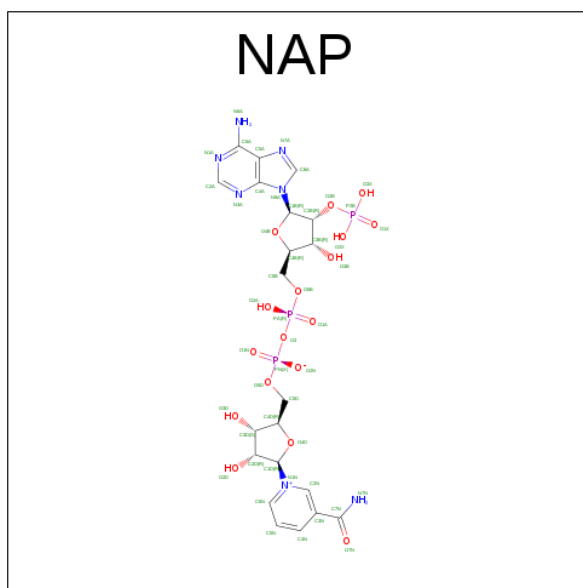
There are 4 unique types of molecules in this entry. The entry contains 5716 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 3-oxo-5-beta-steroid 4-dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	325	Total	C	N	O	S	0	0	0
			2627	1680	455	481	11			
1	B	325	Total	C	N	O	S	0	0	0
			2627	1680	455	481	11			

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula:  $C_{21}H_{28}N_7O_{17}P_3$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



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

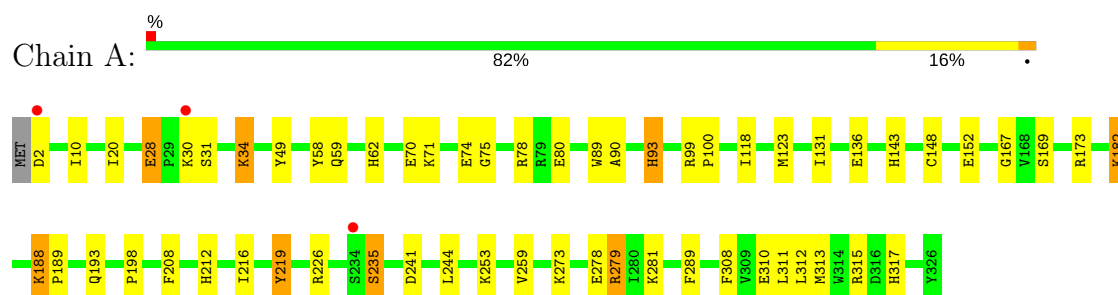
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	197	Total	O	0	0
			197	197		
4	B	151	Total	O	0	0
			151	151		

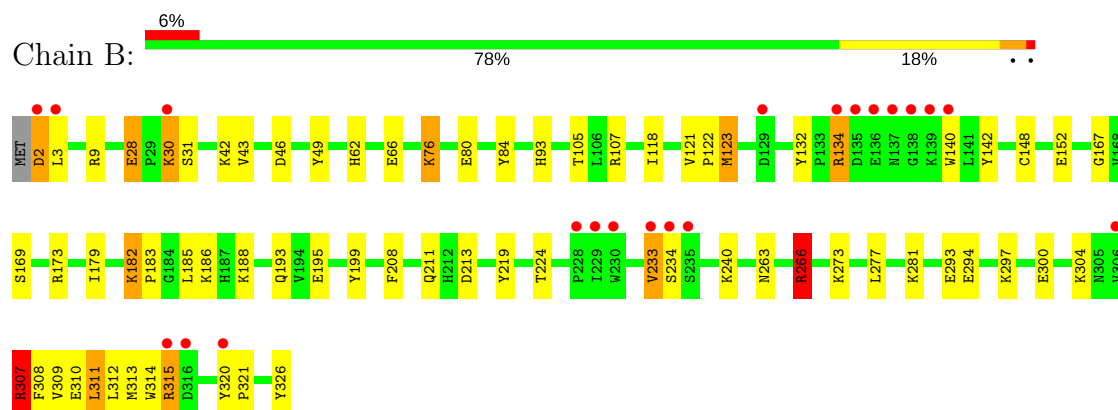
### 3 Residue-property plots

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: 3-oxo-5-beta-steroid 4-dehydrogenase



- Molecule 1: 3-oxo-5-beta-steroid 4-dehydrogenase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	49.83Å 109.83Å 129.19Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.79 45.38 – 1.79	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-1.79) 98.6 (45.38-1.79)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.46 (at 1.79Å)	Xtriage
Refinement program	SHELXL-97	Depositor
R, $R_{free}$	0.236 , 0.257 0.193 , 0.197	Depositor DCC
$R_{free}$ test set	3382 reflections (5.34%)	DCC
Wilson B-factor (Å <sup>2</sup> )	17.6	Xtriage
Anisotropy	0.122	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 65.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	5716	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.11% 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

### 5.1 Standard geometry

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

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	0.34	0/2692	0.94	6/3649 (0.2%)
1	B	0.44	1/2692 (0.0%)	0.98	11/3649 (0.3%)
All	All	0.39	1/5384 (0.0%)	0.96	17/7298 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	326	TYR	C-OXT	12.52	1.47	1.23

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	266	ARG	NE-CZ-NH1	11.32	125.96	120.30
1	A	219	TYR	CA-CB-CG	9.11	130.70	113.40
1	B	266	ARG	NE-CZ-NH2	-8.00	116.30	120.30
1	B	307	ARG	NE-CZ-NH1	-7.88	116.36	120.30
1	B	219	TYR	CA-CB-CG	7.64	127.91	113.40
1	B	266	ARG	CD-NE-CZ	7.35	133.89	123.60
1	B	9	ARG	NE-CZ-NH2	-6.32	117.14	120.30
1	B	307	ARG	NE-CZ-NH2	6.27	123.44	120.30
1	B	183	PRO	O-C-N	-6.20	112.65	123.20
1	A	49	TYR	CA-CB-CG	6.09	124.97	113.40
1	B	107	ARG	NE-CZ-NH2	-6.04	117.28	120.30
1	A	226	ARG	NE-CZ-NH1	5.86	123.23	120.30
1	B	84	TYR	CB-CG-CD1	-5.72	117.57	121.00
1	A	219	TYR	CB-CG-CD1	5.54	124.32	121.00
1	A	279	ARG	CD-NE-CZ	5.47	131.26	123.60
1	A	173	ARG	NE-CZ-NH1	-5.44	117.58	120.30
1	B	49	TYR	CA-CB-CG	5.28	123.44	113.40



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	2627	0	2622	35	0
1	B	2627	0	2622	51	0
2	A	48	0	25	4	0
2	B	48	0	25	3	0
3	A	18	0	24	1	0
4	A	197	0	0	3	0
4	B	151	0	0	2	0
All	All	5716	0	5318	87	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 8.

All (87) 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:312:LEU:O	1:B:315:ARG:HD2	1.87	0.75
1:B:293:GLU:O	1:B:297:LYS:HG3	1.85	0.75
1:A:312:LEU:O	1:A:315:ARG:HG2	1.92	0.70
1:B:123:MET:HE2	1:B:321:PRO:HD3	1.73	0.70
1:B:152:GLU:OE1	1:B:182:LYS:HE3	1.92	0.70
1:B:277:LEU:HD11	1:B:281:LYS:HZ1	1.60	0.67
1:B:43:VAL:HG11	1:B:277:LEU:HD12	1.75	0.67
1:A:28:GLU:HG2	1:A:31:SER:OG	1.94	0.66
1:B:263:ASN:O	1:B:266:ARG:HG2	1.96	0.65
1:B:263:ASN:OD1	1:B:266:ARG:HD3	1.97	0.65
1:A:152:GLU:HG3	1:A:182:LYS:HE2	1.80	0.64
1:A:70:GLU:O	1:A:74:GLU:HG2	1.98	0.63
1:B:62:HIS:O	1:B:66:GLU:HG3	1.98	0.63
1:B:30:LYS:HZ2	1:B:30:LYS:HA	1.63	0.63
1:A:75:GLY:HA2	4:A:4190:HOH:O	1.99	0.63
1:B:208:PHE:O	1:B:211:GLN:HB2	1.99	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:3901:NAP:H5N	3:A:3999:GOL:O3	2.00	0.62
1:A:235:SER:HB3	1:A:308:PHE:CE2	2.35	0.61
1:B:134:ARG:HB3	1:B:140:TRP:HA	1.83	0.61
1:B:309:VAL:HG12	1:B:311:LEU:HD13	1.81	0.60
1:B:277:LEU:HD11	1:B:281:LYS:NZ	2.16	0.59
1:B:315:ARG:HA	1:B:320:TYR:CG	2.37	0.59
1:B:132:TYR:HB3	1:B:140:TRP:CZ3	2.38	0.58
1:B:307:ARG:HG3	1:B:310:GLU:HG2	1.85	0.57
1:A:148:CYS:HB3	1:A:182:LYS:HD2	1.86	0.57
1:B:315:ARG:HA	1:B:320:TYR:CD2	2.39	0.57
1:B:277:LEU:O	1:B:281:LYS:HG3	2.04	0.56
1:B:93:HIS:HD2	4:B:4236:HOH:O	1.89	0.56
1:A:253:LYS:HE3	1:A:289:PHE:CD1	2.42	0.55
1:A:34:LYS:N	1:A:34:LYS:HD3	2.21	0.55
1:A:89:TRP:NE1	1:A:131:ILE:HG23	2.21	0.55
1:B:148:CYS:O	1:B:152:GLU:HG3	2.06	0.54
1:B:273:LYS:O	2:B:3902:NAP:H8A	2.07	0.54
1:A:118:ILE:HD12	1:A:169:SER:HB2	1.88	0.54
1:B:193:GLN:OE1	2:B:3902:NAP:H2N	2.09	0.52
1:B:185:LEU:HD21	1:B:188:LYS:HG2	1.91	0.52
1:A:89:TRP:CD1	1:A:131:ILE:HG23	2.45	0.52
1:A:62:HIS:HE1	4:A:4222:HOH:O	1.93	0.52
1:A:310:GLU:HB2	1:A:312:LEU:HG	1.92	0.51
1:B:140:TRP:HB3	1:B:142:TYR:CE2	2.46	0.51
1:B:123:MET:CE	1:B:321:PRO:HD3	2.40	0.51
1:B:195:GLU:OE2	1:B:308:PHE:HB2	2.11	0.51
1:B:121:VAL:HB	1:B:123:MET:HE3	1.91	0.50
1:B:233:VAL:HG23	1:B:233:VAL:O	2.11	0.50
1:B:315:ARG:HG3	1:B:315:ARG:HH11	1.77	0.50
1:A:99:ARG:HB3	1:A:100:PRO:HD3	1.94	0.49
1:B:224:THR:C	2:B:3902:NAP:H51A	2.33	0.49
1:B:118:ILE:HG22	1:B:167:GLY:CA	2.43	0.49
1:B:132:TYR:HB3	1:B:140:TRP:HZ3	1.77	0.49
1:B:179:ILE:O	1:B:182:LYS:HB2	2.14	0.48
1:B:263:ASN:HA	1:B:266:ARG:HD3	1.96	0.48
1:B:311:LEU:HG	1:B:314:TRP:CE3	2.49	0.48
1:A:193:GLN:OE1	2:A:3901:NAP:H2N	2.14	0.47
1:A:152:GLU:CG	1:A:182:LYS:HE2	2.43	0.47
1:B:28:GLU:HB3	1:B:31:SER:OG	2.13	0.47
1:A:279:ARG:HD2	2:A:3901:NAP:C5A	2.44	0.47
1:A:90:ALA:HA	1:A:93:HIS:CE1	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:123:MET:HG2	1:A:317:HIS:ND1	2.30	0.46
1:A:208:PHE:CE1	1:A:212:HIS:CE1	3.03	0.46
1:B:315:ARG:HG3	1:B:315:ARG:NH1	2.32	0.45
1:A:182:LYS:HG2	1:A:182:LYS:HZ2	1.59	0.45
1:B:42:LYS:NZ	4:B:4273:HOH:O	2.49	0.45
1:B:263:ASN:HA	1:B:266:ARG:HG2	1.98	0.45
1:B:199:TYR:CD2	1:B:304:LYS:HE3	2.53	0.44
1:B:2:ASP:HB3	1:B:3:LEU:H	1.65	0.44
1:A:198:PRO:HG2	1:A:259:VAL:HG22	2.00	0.44
1:B:132:TYR:HB3	1:B:140:TRP:CH2	2.53	0.44
1:B:263:ASN:HA	1:B:266:ARG:CD	2.48	0.43
1:B:277:LEU:HD21	1:B:281:LYS:NZ	2.33	0.43
1:A:273:LYS:O	2:A:3901:NAP:H8A	2.19	0.43
1:B:122:PRO:HD2	1:B:123:MET:HE3	2.01	0.43
1:A:58:TYR:O	1:A:59:GLN:HB2	2.19	0.42
1:B:46:ASP:HA	1:B:76:LYS:HE3	2.01	0.42
1:A:188:LYS:HG2	1:A:189:PRO:HD2	2.00	0.42
1:A:80:GLU:CD	1:A:80:GLU:H	2.23	0.42
1:A:78:ARG:HB2	1:A:78:ARG:HE	1.61	0.42
1:B:80:GLU:CD	1:B:80:GLU:H	2.23	0.41
1:B:148:CYS:SG	1:B:182:LYS:HG3	2.60	0.41
1:A:182:LYS:NZ	4:A:4184:HOH:O	2.50	0.41
1:A:188:LYS:HE2	1:A:188:LYS:HB3	1.30	0.41
1:A:278:GLU:OE2	1:A:281:LYS:NZ	2.50	0.41
1:A:118:ILE:HG22	1:A:167:GLY:CA	2.51	0.41
1:A:241:ASP:HB3	1:A:244:LEU:HD12	2.02	0.41
1:A:10:ILE:HG21	1:A:20:ILE:HD12	2.02	0.40
1:A:71:LYS:HA	1:A:71:LYS:HD3	1.81	0.40
1:B:118:ILE:HD12	1:B:169:SER:HB2	2.03	0.40
1:B:307:ARG:HH11	1:B:307:ARG:HD3	1.52	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	323/326 (99%)	315 (98%)	8 (2%)	0	100	100
1	B	323/326 (99%)	315 (98%)	8 (2%)	0	100	100
All	All	646/652 (99%)	630 (98%)	16 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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	289/290 (100%)	275 (95%)	14 (5%)	30	13
1	B	289/290 (100%)	268 (93%)	21 (7%)	16	5
All	All	578/580 (100%)	543 (94%)	35 (6%)	22	8

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ASP
1	A	28	GLU
1	A	30	LYS
1	A	34	LYS
1	A	93	HIS
1	A	136	GLU
1	A	143	HIS
1	A	182	LYS
1	A	188	LYS
1	A	216	ILE
1	A	219	TYR
1	A	235	SER
1	A	311	LEU
1	A	313	MET
1	B	2	ASP

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Mol	Chain	Res	Type
1	B	28	GLU
1	B	30	LYS
1	B	76	LYS
1	B	105	THR
1	B	123	MET
1	B	134	ARG
1	B	173	ARG
1	B	182	LYS
1	B	186	LYS
1	B	213	ASP
1	B	233	VAL
1	B	234	SER
1	B	240	LYS
1	B	266	ARG
1	B	294	GLU
1	B	300	GLU
1	B	307	ARG
1	B	311	LEU
1	B	313	MET
1	B	315	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	62	HIS
1	B	92	ASN
1	B	93	HIS

### 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

5 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	NAP	A	3901	-	44,52,52	2.19	15 (34%)	51,80,80	1.91	10 (19%)
3	GOL	A	3991	-	5,5,5	0.48	0	5,5,5	0.57	0
3	GOL	A	3992	-	5,5,5	0.44	0	5,5,5	0.75	0
3	GOL	A	3999	-	5,5,5	0.54	0	5,5,5	0.66	0
2	NAP	B	3902	-	44,52,52	2.18	13 (29%)	51,80,80	1.91	9 (17%)

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	NAP	A	3901	-	-	0/27/67/67	0/5/5/5
3	GOL	A	3991	-	-	0/4/4/4	0/0/0/0
3	GOL	A	3992	-	-	0/4/4/4	0/0/0/0
3	GOL	A	3999	-	-	0/4/4/4	0/0/0/0
2	NAP	B	3902	-	-	0/27/67/67	0/5/5/5

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	3902	NAP	O5B-C5B	-5.26	1.23	1.44
2	A	3901	NAP	O5B-C5B	-4.86	1.25	1.44
2	B	3902	NAP	O4B-C4B	-4.14	1.35	1.45
2	A	3901	NAP	O4B-C4B	-3.69	1.36	1.45
2	A	3901	NAP	PN-O5D	-3.24	1.45	1.59
2	B	3902	NAP	PN-O5D	-3.10	1.45	1.59
2	B	3902	NAP	PN-O1N	-3.08	1.39	1.50
2	A	3901	NAP	PN-O1N	-3.07	1.39	1.50
2	B	3902	NAP	PA-O1A	-2.81	1.40	1.50
2	A	3901	NAP	PA-O1A	-2.50	1.41	1.50

*Continued on next page...*

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	3901	NAP	O3D-C3D	2.04	1.47	1.43
2	B	3902	NAP	O4D-C1D	2.04	1.44	1.41
2	A	3901	NAP	C2A-N1A	2.05	1.37	1.33
2	A	3901	NAP	C2N-C3N	2.25	1.42	1.39
2	B	3902	NAP	O4B-C1B	2.46	1.44	1.41
2	B	3902	NAP	O3D-C3D	2.51	1.48	1.43
2	B	3902	NAP	C5N-C4N	2.56	1.43	1.38
2	B	3902	NAP	P2B-O2B	2.57	1.64	1.59
2	A	3901	NAP	C3D-C4D	2.60	1.59	1.53
2	A	3901	NAP	O4D-C1D	2.71	1.45	1.41
2	A	3901	NAP	O4B-C1B	2.72	1.45	1.41
2	A	3901	NAP	C5N-C4N	2.96	1.44	1.38
2	B	3902	NAP	C4N-C3N	3.41	1.44	1.39
2	A	3901	NAP	C4N-C3N	3.47	1.45	1.39
2	A	3901	NAP	C6N-N1N	4.91	1.48	1.35
2	B	3902	NAP	C6N-N1N	4.92	1.48	1.35
2	B	3902	NAP	C4A-N3A	5.90	1.44	1.35
2	A	3901	NAP	C4A-N3A	6.23	1.44	1.35

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	3901	NAP	N3A-C2A-N1A	-8.59	121.38	128.86
2	B	3902	NAP	N3A-C2A-N1A	-7.63	122.21	128.86
2	A	3901	NAP	O4D-C4D-C3D	-2.56	100.08	105.17
2	B	3902	NAP	O2D-C2D-C3D	-2.38	104.21	111.83
2	A	3901	NAP	O4B-C1B-C2B	-2.35	102.49	106.59
2	A	3901	NAP	C3N-C2N-N1N	-2.26	118.15	120.43
2	B	3902	NAP	C6N-C5N-C4N	-2.02	116.39	119.44
2	A	3901	NAP	C3N-C7N-N7N	-2.01	115.48	117.77
2	B	3902	NAP	O3X-P2B-O2X	2.05	115.90	107.61
2	B	3902	NAP	C5N-C4N-C3N	2.14	122.87	120.35
2	A	3901	NAP	O3D-C3D-C2D	2.16	118.75	111.83
2	B	3902	NAP	C4B-O4B-C1B	2.64	112.58	109.77
2	A	3901	NAP	C2N-C3N-C4N	2.72	121.36	118.26
2	A	3901	NAP	O5D-C5D-C4D	3.14	120.12	109.00
2	A	3901	NAP	C5A-C6A-N6A	3.31	127.23	120.47
2	B	3902	NAP	O5D-C5D-C4D	3.53	121.52	109.00
2	B	3902	NAP	C5A-C6A-N6A	3.83	128.27	120.47
2	A	3901	NAP	O5B-C5B-C4B	4.76	125.89	109.00
2	B	3902	NAP	O5B-C5B-C4B	5.46	128.35	109.00

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	3901	NAP	4	0
3	A	3999	GOL	1	0
2	B	3902	NAP	3	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	325/326 (99%)	0.14	3 (0%) 84 82	10, 16, 34, 58	0
1	B	325/326 (99%)	0.52	21 (6%) 20 16	10, 22, 52, 94	0
All	All	650/652 (99%)	0.33	24 (3%) 42 37	10, 19, 44, 94	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	229	ILE	5.2
1	B	138	GLY	5.1
1	B	140	TRP	4.6
1	B	136	GLU	4.5
1	B	30	LYS	4.1
1	B	234	SER	4.1
1	B	137	ASN	3.8
1	B	230	TRP	3.7
1	B	233	VAL	3.6
1	A	234	SER	3.5
1	B	135	ASP	3.5
1	B	235	SER	3.4
1	B	2	ASP	3.0
1	B	134	ARG	2.7
1	B	129	ASP	2.5
1	B	228	PRO	2.5
1	A	2	ASP	2.4
1	B	316	ASP	2.3
1	B	320	TYR	2.2
1	B	3	LEU	2.2
1	A	30	LYS	2.2
1	B	139	LYS	2.1
1	B	306	VAL	2.1
1	B	315	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, 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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
3	GOL	A	3991	6/6	0.77	0.23	7.51	37,38,44,45	0
3	GOL	A	3999	6/6	0.89	0.15	3.88	17,33,37,50	0
2	NAP	B	3902	48/48	0.95	0.10	0.42	10,18,23,33	0
2	NAP	A	3901	48/48	0.96	0.10	0.23	10,13,18,23	0
3	GOL	A	3992	6/6	0.86	0.19	-	28,36,43,66	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.