



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 8, 2023 – 01:23 am GMT

PDB ID : 1V18  
Title : The crystal structure of beta-catenin armadillo repeat complexed with a phosphorylated APC 20mer repeat.  
Authors : Ha, N.-C.; Weis, W.I.  
Deposited on : 2004-04-09  
Resolution : 2.10 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>.

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

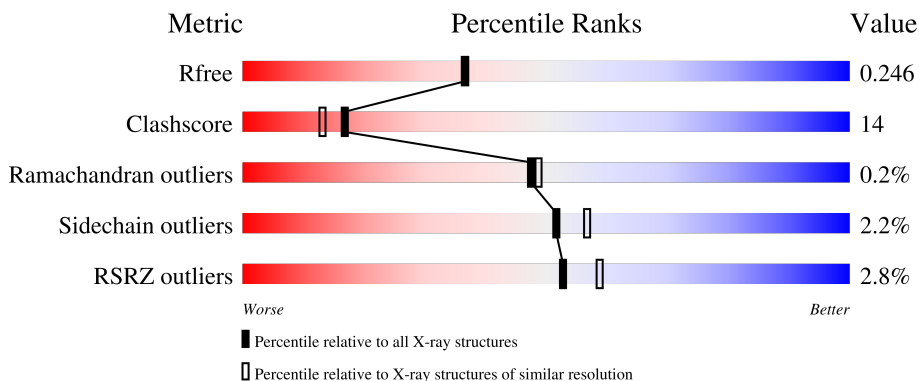
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	538	
2	B	47	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4430 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 BETA-CATENIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	508	3874	2433	707	708	26	0	0	1

- Molecule 2 is a protein called ADENOMATOUS POLYPOSIS COLI.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	P	S			
2	B	40	321	193	47	76	4	1	0	0	0

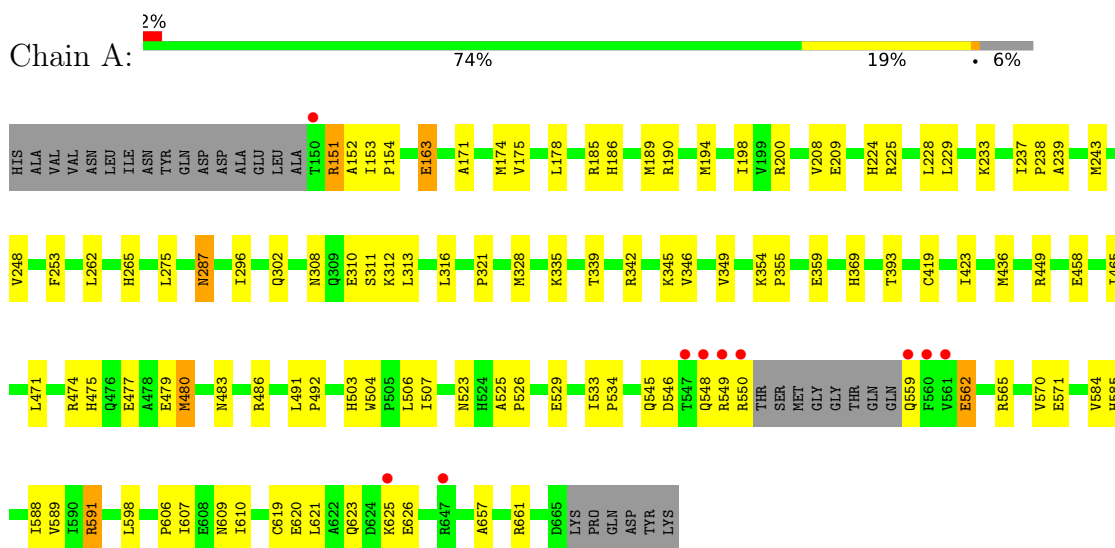
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	208	Total	O	0	0
			208	208		
3	B	27	Total	O	0	0
			27	27		

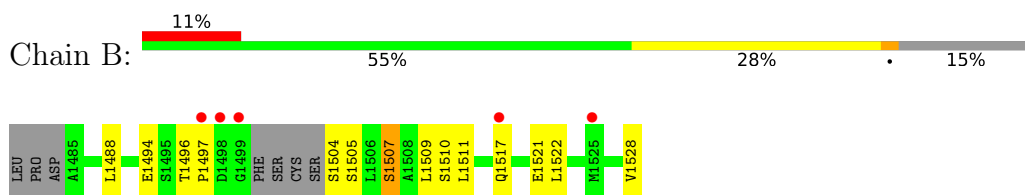
### 3 Residue-property plots [i](#)

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: BETA-CATENIN



- Molecule 2: ADENOMATOUS POLYPOSIS COLI



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	50.83Å 90.06Å 122.81Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.10 46.97 – 2.10	Depositor EDS
% Data completeness (in resolution range)	92.7 (50.00-2.10) 92.8 (46.97-2.10)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.93 (at 2.10Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.207 , 0.253 0.200 , 0.246	Depositor DCC
$R_{free}$ test set	3277 reflections (9.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	37.1	Xtrriage
Anisotropy	0.527	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 48.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	4430	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	47.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.24% 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: SEP

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	0.30	0/3928	0.54	0/5329
2	B	0.33	0/284	0.54	0/382
All	All	0.30	0/4212	0.54	0/5711

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	3874	0	4022	117	0
2	B	321	0	293	14	0
3	A	208	0	0	7	0
3	B	27	0	0	0	0
All	All	4430	0	4315	120	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 14.

All (120) 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:308:ASN:HD21	1:A:310:GLU:HG2	1.10	1.08
1:A:151:ARG:HD2	1:A:152:ALA:H	1.29	0.96
1:A:308:ASN:ND2	1:A:310:GLU:HG2	1.80	0.95
1:A:483:ASN:HD21	1:A:486:ARG:HH22	1.00	0.93
1:A:571:GLU:HB3	1:A:610:ILE:HD13	1.51	0.92
1:A:151:ARG:CD	1:A:152:ALA:H	1.88	0.87
1:A:483:ASN:ND2	1:A:486:ARG:HH22	1.74	0.83
1:A:153:ILE:HB	1:A:154:PRO:HD3	1.62	0.81
1:A:308:ASN:HD21	1:A:310:GLU:CG	1.90	0.80
1:A:606:PRO:HG2	1:A:607:ILE:HD12	1.64	0.77
1:A:151:ARG:HD2	1:A:152:ALA:N	2.01	0.76
1:A:237:ILE:HB	1:A:238:PRO:HD3	1.68	0.76
1:A:186:HIS:O	1:A:190:ARG:HD3	1.89	0.73
1:A:339:THR:HG22	3:A:2065:HOH:O	1.87	0.73
1:A:308:ASN:HD22	1:A:311:SER:H	1.34	0.72
1:A:483:ASN:HD21	1:A:486:ARG:NH2	1.83	0.70
1:A:591:ARG:HB3	1:A:591:ARG:HH11	1.60	0.67
1:A:313:LEU:O	1:A:313:LEU:HD23	1.95	0.67
1:A:354:LYS:HB2	1:A:355:PRO:HD3	1.75	0.67
1:A:479:GLU:H	1:A:479:GLU:CD	1.98	0.67
1:A:349:VAL:HG21	2:B:1494:GLU:HB2	1.76	0.66
1:A:175:VAL:HG11	1:A:198:ILE:HD11	1.76	0.65
1:A:174:MET:HE2	1:A:178:LEU:HG	1.78	0.64
1:A:171:ALA:O	1:A:175:VAL:HG23	1.98	0.63
1:A:591:ARG:HH11	1:A:591:ARG:CB	2.11	0.63
1:A:312:LYS:HE2	1:A:346:VAL:HG12	1.81	0.63
1:A:436:MET:SD	1:A:477:GLU:HG2	2.38	0.63
1:A:163:GLU:H	1:A:163:GLU:CD	2.01	0.63
1:A:533:ILE:HB	1:A:534:PRO:HD3	1.80	0.62
1:A:151:ARG:CG	1:A:152:ALA:H	2.11	0.62
2:B:1521:GLU:H	2:B:1521:GLU:CD	2.00	0.62
1:A:584:VAL:HG13	1:A:585:HIS:N	2.15	0.61
1:A:393:THR:HG21	2:B:1488:LEU:HD21	1.83	0.60
1:A:550:ARG:CZ	1:A:559:GLN:HE22	2.14	0.60
1:A:607:ILE:HD12	1:A:607:ILE:N	2.16	0.60
1:A:525:ALA:HB3	1:A:526:PRO:HD3	1.84	0.59
1:A:625:LYS:HG3	1:A:626:GLU:N	2.18	0.58
2:B:1496:THR:HG23	2:B:1497:PRO:HD2	1.85	0.58
1:A:471:LEU:O	1:A:475:HIS:HE1	1.87	0.57
1:A:620:GLU:O	1:A:623:GLN:HG2	2.05	0.57
1:A:237:ILE:CD1	1:A:262:LEU:HD13	2.35	0.57
1:A:483:ASN:ND2	1:A:486:ARG:NH2	2.49	0.57

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:ASN:ND2	1:A:311:SER:H	2.00	0.56
1:A:571:GLU:OE2	1:A:609:ASN:HB3	2.05	0.56
1:A:275:LEU:HD22	3:A:2028:HOH:O	2.04	0.56
1:A:151:ARG:CG	1:A:152:ALA:N	2.69	0.55
1:A:253:PHE:HB2	2:B:1511:LEU:HD21	1.88	0.55
1:A:265:HIS:HB3	2:B:1522:LEU:HD22	1.89	0.54
1:A:175:VAL:HG11	1:A:198:ILE:CD1	2.37	0.54
1:A:623:GLN:HB3	1:A:661:ARG:NH1	2.23	0.54
1:A:483:ASN:HD22	1:A:486:ARG:HH12	1.56	0.54
1:A:565:ARG:HH11	1:A:565:ARG:HG3	1.73	0.54
1:A:483:ASN:ND2	1:A:486:ARG:HH12	2.07	0.53
1:A:345:LYS:HZ2	2:B:1496:THR:CB	2.22	0.53
1:A:458:GLU:HG2	1:A:506:LEU:HD22	1.91	0.53
1:A:474:ARG:HH11	1:A:474:ARG:HG3	1.74	0.52
1:A:174:MET:CE	1:A:178:LEU:HG	2.39	0.52
1:A:229:LEU:HD11	1:A:233:LYS:HE3	1.92	0.51
1:A:237:ILE:HD11	1:A:262:LEU:HD13	1.93	0.51
1:A:310:GLU:HG3	3:A:2032:HOH:O	2.09	0.51
1:A:591:ARG:HH21	1:A:626:GLU:HB2	1.76	0.51
1:A:185:ARG:HD2	1:A:224:HIS:NE2	2.26	0.50
1:A:584:VAL:HG13	1:A:585:HIS:H	1.76	0.50
1:A:296:ILE:HD12	2:B:1509:LEU:HG	1.93	0.50
1:A:209:GLU:HA	1:A:209:GLU:OE2	2.11	0.50
1:A:546:ASP:O	1:A:550:ARG:HG2	2.12	0.50
1:A:419:CYS:O	1:A:423:ILE:HG13	2.11	0.49
1:A:328:MET:O	1:A:369:HIS:HE1	1.95	0.49
1:A:477:GLU:O	1:A:480:MET:HG3	2.14	0.48
1:A:200:ARG:HG2	1:A:200:ARG:HH11	1.78	0.48
1:A:491:LEU:HB2	1:A:492:PRO:HD3	1.94	0.48
1:A:570:VAL:HG12	1:A:610:ILE:HD12	1.97	0.47
1:A:194:MET:O	1:A:198:ILE:HG12	2.15	0.47
1:A:312:LYS:HE2	1:A:346:VAL:CG1	2.44	0.47
1:A:436:MET:SD	1:A:475:HIS:HD2	2.37	0.47
1:A:525:ALA:O	1:A:529:GLU:HG3	2.16	0.46
1:A:335:LYS:O	1:A:339:THR:HG23	2.15	0.46
1:A:355:PRO:O	1:A:359:GLU:HG3	2.16	0.46
1:A:491:LEU:CD1	1:A:526:PRO:HB2	2.46	0.46
1:A:504:TRP:HB2	1:A:562:GLU:HB3	1.97	0.45
1:A:523:ASN:C	1:A:526:PRO:HD2	2.36	0.45
1:A:275:LEU:HD23	1:A:275:LEU:O	2.15	0.45
1:A:657:ALA:O	1:A:661:ARG:HG2	2.17	0.45

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:548:GLN:C	1:A:550:ARG:H	2.20	0.45
1:A:559:GLN:O	1:A:565:ARG:HG2	2.17	0.45
1:A:174:MET:HE2	1:A:178:LEU:CG	2.45	0.45
1:A:503:HIS:O	1:A:507:ILE:HG12	2.17	0.45
1:A:335:LYS:NZ	2:B:1507:SEP:O2P	2.47	0.44
1:A:584:VAL:CG1	1:A:585:HIS:N	2.81	0.44
1:A:359:GLU:HG2	3:A:2117:HOH:O	2.18	0.44
1:A:208:VAL:HG13	1:A:248:VAL:HG21	1.99	0.43
1:A:228:LEU:HD22	1:A:262:LEU:HD23	2.00	0.43
1:A:449:ARG:HD2	3:A:2140:HOH:O	2.17	0.43
1:A:606:PRO:HG2	1:A:607:ILE:CD1	2.43	0.43
1:A:153:ILE:HB	1:A:154:PRO:CD	2.42	0.43
1:A:275:LEU:HD23	1:A:275:LEU:C	2.40	0.43
2:B:1528:VAL:HG23	2:B:1528:VAL:O	2.19	0.42
1:A:225:ARG:CZ	2:B:1521:GLU:HG3	2.49	0.42
1:A:296:ILE:CD1	2:B:1509:LEU:HG	2.50	0.42
1:A:225:ARG:HD3	2:B:1521:GLU:HG3	2.01	0.42
1:A:296:ILE:HD12	2:B:1509:LEU:CG	2.50	0.42
1:A:479:GLU:CD	1:A:479:GLU:N	2.68	0.42
1:A:585:HIS:O	1:A:589:VAL:HG23	2.19	0.42
1:A:342:ARG:NH2	3:A:2090:HOH:O	2.52	0.41
1:A:565:ARG:HG3	1:A:565:ARG:NH1	2.35	0.41
1:A:287:ASN:N	1:A:287:ASN:HD22	2.17	0.41
1:A:584:VAL:O	1:A:588:ILE:HG12	2.20	0.41
1:A:504:TRP:HD1	1:A:562:GLU:HB2	1.86	0.41
1:A:545:GLN:HA	1:A:548:GLN:HE21	1.86	0.41
1:A:316:LEU:HD12	1:A:321:PRO:HG2	2.01	0.41
1:A:355:PRO:HG3	3:A:2048:HOH:O	2.20	0.41
1:A:186:HIS:HA	1:A:189:MET:HG2	2.02	0.41
1:A:237:ILE:HD13	1:A:262:LEU:HD13	2.01	0.41
1:A:186:HIS:O	1:A:189:MET:HG2	2.21	0.41
1:A:239:ALA:O	1:A:243:MET:HG2	2.21	0.40
1:A:308:ASN:ND2	1:A:310:GLU:CG	2.64	0.40
1:A:504:TRP:HB2	1:A:562:GLU:CB	2.52	0.40
1:A:619:CYS:O	1:A:661:ARG:NH1	2.54	0.40
1:A:151:ARG:HG2	1:A:152:ALA:N	2.36	0.40
1:A:465:ILE:HD13	1:A:465:ILE:HA	1.95	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	504/538 (94%)	498 (99%)	5 (1%)	1 (0%)	47	49
2	B	33/47 (70%)	29 (88%)	4 (12%)	0	100	100
All	All	537/585 (92%)	527 (98%)	9 (2%)	1 (0%)	47	49

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	549	ARG

### 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	421/447 (94%)	412 (98%)	9 (2%)	53	59
2	B	32/39 (82%)	31 (97%)	1 (3%)	40	43
All	All	453/486 (93%)	443 (98%)	10 (2%)	52	57

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	151	ARG
1	A	163	GLU
1	A	287	ASN
1	A	302	GLN
1	A	480	MET

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	562	GLU
1	A	591	ARG
1	A	598	LEU
1	A	621	LEU
2	B	1517	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	169	ASN
1	A	177	GLN
1	A	193	GLN
1	A	203	GLN
1	A	204	ASN
1	A	266	GLN
1	A	287	ASN
1	A	302	GLN
1	A	308	ASN
1	A	369	HIS
1	A	415	ASN
1	A	440	GLN
1	A	475	HIS
1	A	476	GLN
1	A	483	ASN
1	A	545	GLN
1	A	548	GLN
1	A	559	GLN
1	A	578	HIS
1	A	623	GLN
2	B	1517	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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	SEP	B	1505	2	8,9,10	2.77	2 (25%)	8,12,14	4.67	4 (50%)
2	SEP	B	1510	2	8,9,10	2.71	3 (37%)	8,12,14	4.86	4 (50%)
2	SEP	B	1504	2	8,9,10	2.73	2 (25%)	8,12,14	4.58	4 (50%)
2	SEP	B	1507	2	8,9,10	2.73	2 (25%)	8,12,14	3.79	4 (50%)

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	SEP	B	1505	2	-	0/5/8/10	-
2	SEP	B	1510	2	-	1/5/8/10	-
2	SEP	B	1504	2	-	0/5/8/10	-
2	SEP	B	1507	2	-	0/5/8/10	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1505	SEP	OG-CB	-6.89	1.18	1.44
2	B	1504	SEP	OG-CB	-6.78	1.18	1.44
2	B	1510	SEP	OG-CB	-6.65	1.19	1.44
2	B	1507	SEP	OG-CB	-6.65	1.19	1.44
2	B	1507	SEP	P-OG	-3.04	1.50	1.60
2	B	1504	SEP	P-OG	-2.57	1.51	1.60
2	B	1505	SEP	P-OG	-2.52	1.52	1.60
2	B	1510	SEP	P-OG	-2.28	1.52	1.60
2	B	1510	SEP	P-O1P	2.18	1.57	1.50

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1510	SEP	OG-CB-CA	8.16	116.08	108.14
2	B	1510	SEP	P-OG-CB	-7.63	97.29	118.30
2	B	1505	SEP	P-OG-CB	-7.42	97.86	118.30

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1505	SEP	OG-CB-CA	7.42	115.36	108.14
2	B	1504	SEP	P-OG-CB	-7.34	98.07	118.30
2	B	1504	SEP	OG-CB-CA	6.86	114.82	108.14
2	B	1507	SEP	P-OG-CB	-6.57	100.20	118.30
2	B	1507	SEP	O2P-P-OG	-5.71	91.55	106.73
2	B	1504	SEP	O2P-P-OG	-5.70	91.55	106.73
2	B	1505	SEP	O2P-P-OG	-5.62	91.78	106.73
2	B	1510	SEP	O2P-P-OG	-5.61	91.80	106.73
2	B	1504	SEP	OG-P-O1P	5.60	122.19	106.47
2	B	1510	SEP	OG-P-O1P	5.44	121.74	106.47
2	B	1505	SEP	OG-P-O1P	5.39	121.60	106.47
2	B	1507	SEP	OG-P-O1P	5.26	121.23	106.47
2	B	1507	SEP	OG-CB-CA	2.81	110.88	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	1510	SEP	N-CA-CB-OG

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1507	SEP	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	508/538 (94%)	-0.08	10 (1%) 65 69	30, 43, 67, 99	0
2	B	36/47 (76%)	0.49	5 (13%) 2 3	41, 55, 78, 85	0
All	All	544/585 (92%)	-0.04	15 (2%) 53 59	30, 44, 69, 99	0

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	150	THR	5.8
1	A	549	ARG	4.1
2	B	1498	ASP	4.0
1	A	560	PHE	4.0
1	A	559	GLN	3.5
1	A	550	ARG	3.1
1	A	647	ARG	2.6
2	B	1499	GLY	2.5
2	B	1525	MET	2.4
1	A	625	LYS	2.4
1	A	548	GLN	2.3
1	A	547	THR	2.3
2	B	1497	PRO	2.3
2	B	1517	GLN	2.2
1	A	561	VAL	2.2

### 6.2 Non-standard residues in protein, DNA, RNA chains [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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	SEP	B	1510	10/11	0.75	0.21	52,63,68,68	0
2	SEP	B	1504	10/11	0.79	0.17	78,84,87,87	0
2	SEP	B	1505	10/11	0.81	0.13	67,77,80,80	0
2	SEP	B	1507	10/11	0.93	0.11	47,49,50,50	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

There are no ligands in this entry.

### 6.5 Other polymers [i](#)

There are no such residues in this entry.