



# wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 15, 2026 – 12:08 PM UTC

PDB ID : 6BLI / pdb\_00006bli  
Title : RSV G peptide bound to Fab CB002.5  
Authors : Jones, H.G.; McLellan, J.S.; Langedijk, J.P.  
Deposited on : 2017-11-10  
Resolution : 2.12 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

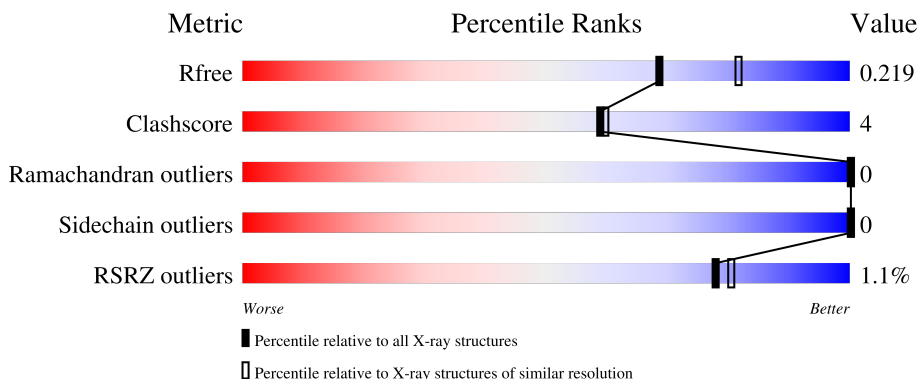
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.12 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))
$R_{free}$	180053	8290 (2.14-2.10)
Clashscore	190562	8817 (2.14-2.10)
Ramachandran outliers	187476	8738 (2.14-2.10)
Sidechain outliers	187428	8739 (2.14-2.10)
RSRZ outliers	180081	8294 (2.14-2.10)

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	231	 86% 9% . .
1	D	231	 86% 10% .
1	G	231	 84% 12% .
1	J	231	 84% 11% .
2	B	215	 93% 7%

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Mol	Chain	Length	Quality of chain
2	E	215	 95% 5%
2	H	215	 93% 7%
2	K	215	 93% 7%
3	C	45	 2% 58% 9% 33%
3	F	45	 2% 60% 38%
3	I	45	 2% 58% 38%
3	L	45	 56% 9% 36%

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 16010 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 CB002.5 Fab Heavy Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	221	Total 1663	C 1054	N 276	O 327	S 6	0	0	0
1	D	221	Total 1663	C 1054	N 276	O 327	S 6	0	0	0
1	G	221	Total 1663	C 1054	N 276	O 327	S 6	0	0	0
1	J	221	Total 1663	C 1054	N 276	O 327	S 6	0	0	0

- Molecule 2 is a protein called CB002.5 Fab Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	214	Total 1647	C 1030	N 276	O 336	S 5	0	0	0
2	E	214	Total 1647	C 1030	N 276	O 336	S 5	0	0	0
2	H	214	Total 1647	C 1030	N 276	O 336	S 5	0	0	0
2	K	214	Total 1647	C 1030	N 276	O 336	S 5	0	0	0

- Molecule 3 is a protein called Major surface glycoprotein G.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	30	Total 245	C 157	N 42	O 42	S 4	0	0	0
3	F	28	Total 229	C 149	N 38	O 38	S 4	0	0	0
3	I	28	Total 228	C 150	N 38	O 36	S 4	0	0	0
3	L	29	Total 236	C 154	N 40	O 38	S 4	0	0	0

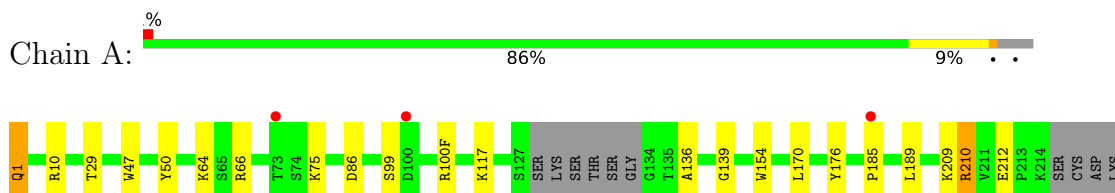
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	246	Total O 246 246	0	0
4	B	244	Total O 244 244	0	0
4	C	22	Total O 22 22	0	0
4	D	199	Total O 199 199	0	0
4	E	243	Total O 243 243	0	0
4	F	14	Total O 14 14	0	0
4	G	178	Total O 178 178	0	0
4	H	240	Total O 240 240	0	0
4	I	18	Total O 18 18	0	0
4	J	207	Total O 207 207	0	0
4	K	201	Total O 201 201	0	0
4	L	20	Total O 20 20	0	0

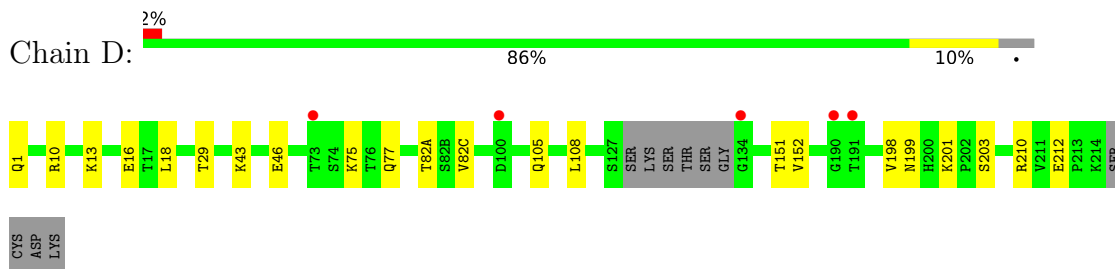
### 3 Residue-property plots [i](#)

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.

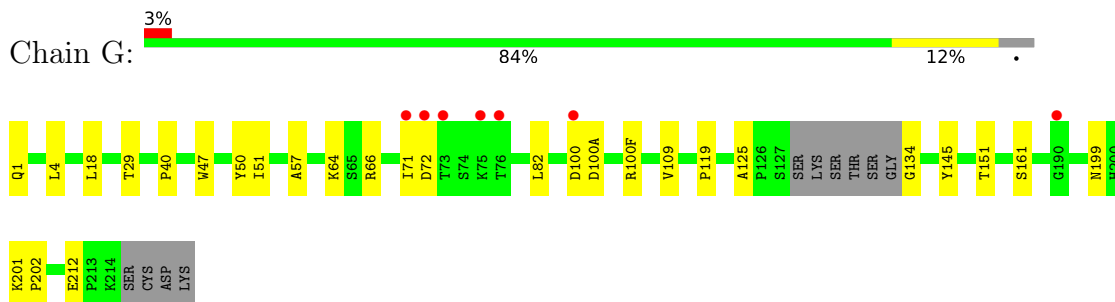
- Molecule 1: CB002.5 Fab Heavy Chain



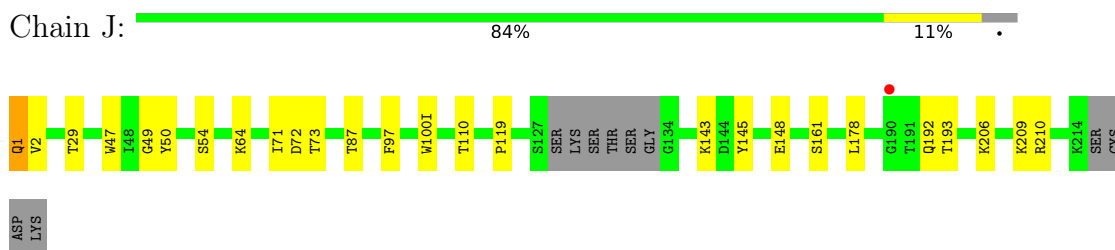
- Molecule 1: CB002.5 Fab Heavy Chain



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- Molecule 1: CB002.5 Fab Heavy Chain



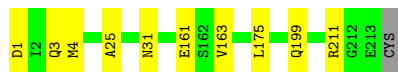
- Molecule 2: CB002.5 Fab Light Chain

Chain B:  93% 7%



- Molecule 2: CB002.5 Fab Light Chain

Chain E:  95% 5%



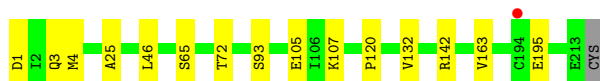
- Molecule 2: CB002.5 Fab Light Chain

Chain H:  93% 7%



- Molecule 2: CB002.5 Fab Light Chain

Chain K:  93% 7%



- Molecule 3: Major surface glycoprotein G

Chain C:  2% 58% 9% 33%



- Molecule 3: Major surface glycoprotein G

Chain F:  2% 60% 0% 38%



- Molecule 3: Major surface glycoprotein G

Chain I:  2% 58% 0% 38%



- Molecule 3: Major surface glycoprotein G

Chain L:  56% 9% 36%

ASN	F163	C173	S174	I175	C176	C182	N191	LYS	LYS	PRO	GLY	LYS	LYS
LYS								LYS	LYS	PRO	GLY	LYS	LYS
PRO								LYS	LYS	PRO	GLY	LYS	LYS
ASN								LYS	LYS	PRO	GLY	LYS	LYS
ASN								LYS	LYS	PRO	GLY	LYS	LYS
ASN								LYS	LYS	PRO	GLY	LYS	LYS
ASN								LYS	LYS	PRO	GLY	LYS	LYS
ASN								LYS	LYS	PRO	GLY	LYS	LYS
ASP								LYS	LYS	PRO	GLY	LYS	LYS

## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	113.76Å 85.23Å 214.30Å 90.00° 95.03° 90.00°	Depositor
Resolution (Å)	43.13 – 2.12 43.13 – 2.12	Depositor EDS
% Data completeness (in resolution range)	99.0 (43.13-2.12) 99.0 (43.13-2.12)	Depositor EDS
$R_{merge}$	0.17	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.65 (at 2.12Å)	Xtrriage
Refinement program	PHENIX 1.11.1	Depositor
R, $R_{free}$	0.169 , 0.218 0.170 , 0.219	Depositor DCC
$R_{free}$ test set	5575 reflections (4.81%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.0	Xtrriage
Anisotropy	0.133	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 47.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	16010	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 27.82 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.0534e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: PCA

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	0.48	2/1700 (0.1%)	0.63	0/2324
1	D	0.32	0/1700	0.54	0/2324
1	G	0.35	1/1700 (0.1%)	0.55	0/2324
1	J	0.35	0/1700	0.60	0/2324
2	B	0.37	0/1683	0.58	0/2286
2	E	0.36	0/1683	0.55	0/2286
2	H	0.35	0/1683	0.54	0/2286
2	K	0.33	0/1683	0.54	0/2286
3	C	0.31	0/253	0.51	0/344
3	F	0.31	0/237	0.49	0/322
3	I	0.25	0/237	0.49	0/323
3	L	0.36	0/245	0.62	0/334
All	All	0.36	3/14504 (0.0%)	0.56	0/19763

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	40	PRO	CA-C	-6.34	1.48	1.51
1	A	210	ARG	C-O	-5.68	1.17	1.24
1	A	209	LYS	C-O	-5.14	1.18	1.24

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen

atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1663	0	1621	19	0
1	D	1663	0	1621	16	0
1	G	1663	0	1621	19	0
1	J	1663	0	1621	18	1
2	B	1647	0	1594	11	0
2	E	1647	0	1594	7	0
2	H	1647	0	1594	10	0
2	K	1647	0	1594	14	0
3	C	245	0	221	4	0
3	F	229	0	209	2	0
3	I	228	0	212	2	0
3	L	236	0	218	5	0
4	A	246	0	0	9	1
4	B	244	0	0	6	1
4	C	22	0	0	2	0
4	D	199	0	0	7	0
4	E	243	0	0	3	0
4	F	14	0	0	2	0
4	G	178	0	0	8	0
4	H	240	0	0	4	0
4	I	18	0	0	1	0
4	J	207	0	0	9	1
4	K	201	0	0	8	1
4	L	20	0	0	3	0
All	All	16010	0	13720	123	3

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 4.

The worst 5 of 123 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)
3:L:176:CYS:SG	4:L:218:HOH:O	1.98	1.19
1:A:117:LYS:NZ	4:A:301:HOH:O	1.96	0.99
3:F:174:SER:N	4:F:201:HOH:O	1.98	0.93
2:B:1:ASP:OD1	4:B:301:HOH:O	1.88	0.91
2:E:199:GLN:OE1	4:E:301:HOH:O	1.88	0.91

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:64:LYS:NZ	1:J:161:SER:OG[4_556]	1.99	0.21
4:A:490:HOH:O	4:B:517:HOH:O[4_555]	2.05	0.15
4:J:430:HOH:O	4:K:450:HOH:O[4_556]	2.17	0.03

## 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	217/231 (94%)	207 (95%)	10 (5%)	0	100	100
1	D	217/231 (94%)	210 (97%)	7 (3%)	0	100	100
1	G	217/231 (94%)	209 (96%)	8 (4%)	0	100	100
1	J	217/231 (94%)	209 (96%)	8 (4%)	0	100	100
2	B	212/215 (99%)	206 (97%)	6 (3%)	0	100	100
2	E	212/215 (99%)	205 (97%)	7 (3%)	0	100	100
2	H	212/215 (99%)	206 (97%)	6 (3%)	0	100	100
2	K	212/215 (99%)	209 (99%)	3 (1%)	0	100	100
3	C	28/45 (62%)	27 (96%)	1 (4%)	0	100	100
3	F	26/45 (58%)	25 (96%)	1 (4%)	0	100	100
3	I	26/45 (58%)	25 (96%)	1 (4%)	0	100	100
3	L	27/45 (60%)	26 (96%)	1 (4%)	0	100	100
All	All	1823/1964 (93%)	1764 (97%)	59 (3%)	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	189/198 (96%)	189 (100%)	0	100	100
1	D	189/198 (96%)	189 (100%)	0	100	100
1	G	189/198 (96%)	189 (100%)	0	100	100
1	J	189/198 (96%)	189 (100%)	0	100	100
2	B	188/189 (100%)	188 (100%)	0	100	100
2	E	188/189 (100%)	188 (100%)	0	100	100
2	H	188/189 (100%)	188 (100%)	0	100	100
2	K	188/189 (100%)	188 (100%)	0	100	100
3	C	29/43 (67%)	29 (100%)	0	100	100
3	F	27/43 (63%)	27 (100%)	0	100	100
3	I	27/43 (63%)	27 (100%)	0	100	100
3	L	28/43 (65%)	28 (100%)	0	100	100
All	All	1619/1720 (94%)	1619 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 18 such sidechains are listed below:

Mol	Chain	Res	Type
3	I	164	HIS
2	K	38	GLN
2	K	37	GLN
2	E	147	GLN
2	H	160	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
1	PCA	A	1	1	7,8,9	1.98	1 (14%)	9,10,12	2.21	6 (66%)
1	PCA	J	1	1	7,8,9	2.02	1 (14%)	9,10,12	1.97	4 (44%)
1	PCA	G	1	1	7,8,9	1.94	1 (14%)	9,10,12	2.24	5 (55%)
1	PCA	D	1	1	7,8,9	2.04	1 (14%)	9,10,12	2.18	6 (66%)

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
1	PCA	A	1	1	-	0/0/11/13	0/1/1/1
1	PCA	J	1	1	-	0/0/11/13	0/1/1/1
1	PCA	G	1	1	-	0/0/11/13	0/1/1/1
1	PCA	D	1	1	-	0/0/11/13	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	1	PCA	CD-N	5.28	1.47	1.34
1	J	1	PCA	CD-N	5.21	1.47	1.34
1	A	1	PCA	CD-N	5.12	1.47	1.34
1	G	1	PCA	CD-N	5.00	1.46	1.34

The worst 5 of 21 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	1	PCA	CA-N-CD	-3.22	102.56	113.58
1	A	1	PCA	CA-N-CD	-3.19	102.65	113.58
1	D	1	PCA	CA-N-CD	-3.09	103.00	113.58
1	D	1	PCA	OE-CD-CG	-3.06	121.25	126.72
1	G	1	PCA	CB-CA-N	2.82	111.00	103.24

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1	PCA	1	0
1	J	1	PCA	1	0

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides 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 [i](#)

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	220/231 (95%)	-0.43	3 (1%) 73 76	8, 18, 35, 54	0
1	D	220/231 (95%)	-0.21	5 (2%) 61 64	12, 23, 41, 59	0
1	G	220/231 (95%)	0.01	7 (3%) 50 53	12, 26, 50, 78	0
1	J	220/231 (95%)	-0.30	1 (0%) 87 89	11, 21, 39, 56	0
2	B	214/215 (99%)	-0.41	0 100 100	9, 19, 36, 61	0
2	E	214/215 (99%)	-0.46	0 100 100	10, 20, 32, 53	0
2	H	214/215 (99%)	-0.39	0 100 100	10, 21, 34, 51	0
2	K	214/215 (99%)	-0.31	1 (0%) 87 89	9, 22, 43, 59	0
3	C	30/45 (66%)	0.30	1 (3%) 49 52	18, 28, 47, 58	0
3	F	28/45 (62%)	0.61	1 (3%) 46 49	21, 33, 44, 65	0
3	I	28/45 (62%)	0.43	1 (3%) 46 49	19, 33, 46, 48	0
3	L	29/45 (64%)	0.29	0 100 100	17, 29, 48, 59	0
All	All	1851/1964 (94%)	-0.27	20 (1%) 78 80	8, 22, 43, 78	0

The worst 5 of 20 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	189	ILE	4.7
1	D	191	THR	3.8
1	G	73	THR	3.7
1	D	190	GLY	3.4
1	D	134	GLY	2.9

### 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(Å <sup>2</sup> )	Q<0.9
1	PCA	G	1	8/9	0.58	0.17	57,74,82,85	0
1	PCA	J	1	8/9	0.59	0.20	50,62,71,75	0
1	PCA	D	1	8/9	0.66	0.18	47,63,73,80	0
1	PCA	A	1	8/9	0.83	0.13	36,49,60,66	0

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides 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.