



Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 11:42 pm BST

PDB ID : 1JNL
Title : Crystal Structure of Fab-Estradiol Complexes
Authors : Monnet, C.; Bettsworth, F.; Stura, E.A.; Le Du, M.-H.; Menez, R.; Derrien, L.; Zinn-Justin, S.; Gilquin, B.; Sibai, G.; Battail-Poirot, N.; Jolivet, M.; Menez, A.; Arnaud, M.; Ducancel, F.; Charbonnier, J.B.
Deposited on : 2001-07-24
Resolution : 3.00 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

<https://www.wwpdb.org/validation/2017/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
Xtriage (Phenix)	:	1.13
EDS	:	2.11
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)	:	2.11

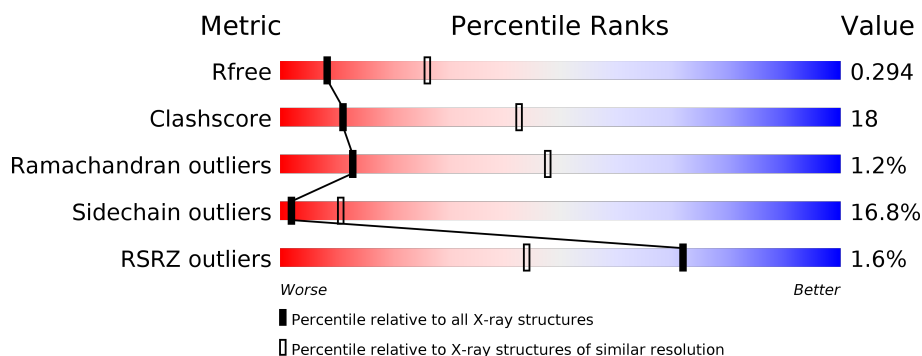
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION



The reported resolution of this entry is 3.00 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	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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 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	L	211	
2	H	216	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3259 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 monoclonal anti-estradiol 17E12E5 immunoglobulin kappa chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	L	211	Total	C	N	O	S	0	0	0
			1646	1035	277	328	6			

- Molecule 2 is a protein called monoclonal anti-estradiol 17E12E5 immunoglobulin gamma-1 chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	216	Total	C	N	O	S	0	0	0
			1613	1015	267	324	7			

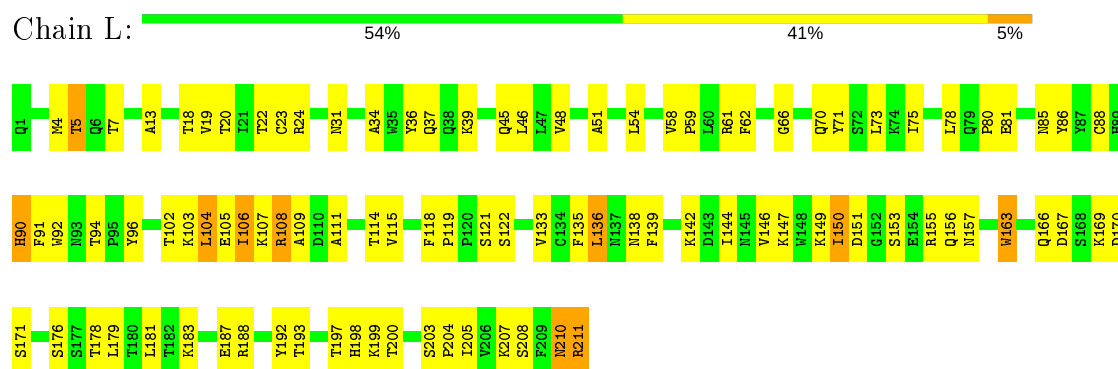
There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	222	LYS	-	see remark 999	GB 12658313
H	223	LYS	-	see remark 999	GB 12658313
H	224	ILE	-	see remark 999	GB 12658313
H	227	VAL	-	see remark 999	GB 12658313
H	228	PRO	-	see remark 999	GB 12658313
H	229	ARG	-	see remark 999	GB 12658313
H	230	ASP	-	see remark 999	GB 12658313
H	231	CYS	-	see remark 999	GB 12658313

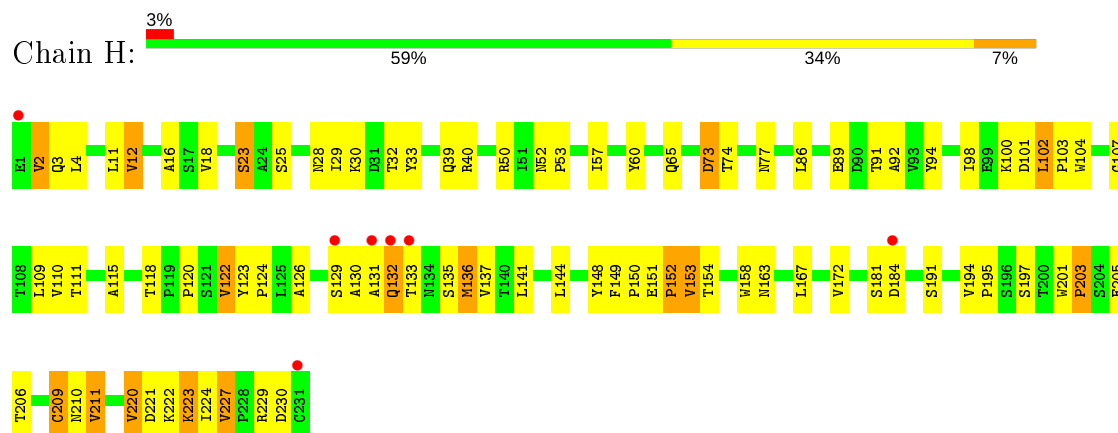
3 Residue-property plots [i](#)

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: monoclonal anti-estradiol 17E12E5 immunoglobulin kappa chain



- Molecule 2: monoclonal anti-estradiol 17E12E5 immunoglobulin gamma-1 chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 2 ₁ 2 ₁ 2	Depositor
Cell constants a, b, c, α , β , γ	70.95Å 143.24Å 53.37Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00 19.73 – 3.00	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-3.00) 91.5 (19.73-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.68 (at 2.98Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.195 , 0.290 0.201 , 0.294	Depositor DCC
R_{free} test set	568 reflections (5.23%)	wwPDB-VP
Wilson B-factor (Å ²)	43.7	Xtriage
Anisotropy	0.406	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.23 , 58.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	3259	wwPDB-VP
Average B, all atoms (Å ²)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.89% 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 [i](#)

5.1 Standard geometry [i](#)

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	L	0.55	0/1687	0.77	1/2293 (0.0%)
2	H	0.52	0/1651	0.83	0/2261
All	All	0.54	0/3338	0.80	1/4554 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	L	138	ASN	N-CA-C	6.37	128.20	111.00

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	L	1646	0	1578	65	0
2	H	1613	0	1576	52	0
All	All	3259	0	3154	115	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 18.

All (115) 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)
2:H:206:THR:HG23	2:H:223:LYS:HE3	1.25	1.18
2:H:211:VAL:HG13	2:H:220:VAL:HG13	1.54	0.88
1:L:119:PRO:HG2	2:H:229:ARG:NH2	1.95	0.81
1:L:150:ILE:HG23	1:L:151:ASP:H	1.48	0.78
2:H:122:VAL:HG22	2:H:222:LYS:HG3	1.67	0.76
2:H:141:LEU:HD12	2:H:224:ILE:HG21	1.68	0.76
2:H:30:LYS:HB3	2:H:74:THR:HG21	1.69	0.74
1:L:155:ARG:NH1	1:L:157:ASN:HB3	2.05	0.70
1:L:108:ARG:HG2	1:L:109:ALA:N	2.06	0.69
1:L:193:THR:HG23	1:L:208:SER:HB3	1.73	0.69
1:L:115:VAL:HB	1:L:136:LEU:HD13	1.75	0.69
2:H:206:THR:CG2	2:H:223:LYS:HE3	2.15	0.68
2:H:12:VAL:HG21	2:H:86:LEU:HD13	1.77	0.67
1:L:166:GLN:NE2	1:L:171:SER:HB3	2.10	0.67
2:H:102:LEU:HG	2:H:103:PRO:HD2	1.76	0.66
2:H:100:LYS:HG2	2:H:101:ASP:H	1.62	0.64
1:L:198:HIS:CG	1:L:199:LYS:H	2.18	0.61
1:L:108:ARG:HH21	1:L:111:ALA:HB2	1.65	0.60
1:L:90:HIS:HD2	1:L:92:TRP:H	1.48	0.60
1:L:19:VAL:HG22	1:L:75:ILE:HB	1.84	0.60
1:L:66:GLY:HA3	1:L:71:TYR:HA	1.83	0.60
1:L:142:LYS:O	1:L:144:ILE:HG22	2.04	0.58
1:L:19:VAL:CG1	1:L:78:LEU:HD11	2.34	0.57
2:H:136:MET:HG3	2:H:195:PRO:HA	1.87	0.57
1:L:183:LYS:O	1:L:187:GLU:HG2	2.05	0.57
1:L:163:TRP:CD1	1:L:163:TRP:N	2.72	0.57
1:L:139:PHE:CZ	1:L:144:ILE:HG21	2.41	0.56
2:H:4:LEU:N	2:H:4:LEU:HD12	2.21	0.56
1:L:80:PRO:HA	1:L:106:ILE:HD12	1.88	0.56
2:H:4:LEU:HA	2:H:23:SER:O	2.05	0.56
2:H:94:TYR:O	2:H:107:GLY:HA2	2.06	0.55
2:H:33:TYR:CE2	2:H:52:ASN:HB2	2.41	0.55
2:H:2:VAL:HA	2:H:25:SER:O	2.07	0.55
2:H:126:ALA:O	2:H:229:ARG:NH2	2.40	0.54
1:L:90:HIS:CD2	1:L:90:HIS:C	2.80	0.54
2:H:39:GLN:O	2:H:92:ALA:HB1	2.08	0.54
1:L:59:PRO:HG2	1:L:62:PHE:CD2	2.43	0.54
1:L:37:GLN:HA	1:L:85:ASN:O	2.08	0.53
1:L:24:ARG:HD3	1:L:70:GLN:HE21	1.73	0.53
2:H:120:PRO:HB3	2:H:148:TYR:HB3	1.91	0.52
2:H:172:VAL:HA	2:H:191:SER:O	2.09	0.52
2:H:122:VAL:HG11	2:H:211:VAL:CG1	2.39	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:151:GLU:OE1	2:H:152:PRO:HA	2.09	0.52
1:L:167:ASP:OD1	1:L:169:LYS:HD2	2.08	0.52
2:H:4:LEU:H	2:H:4:LEU:HD12	1.73	0.52
2:H:154:THR:O	2:H:211:VAL:HA	2.09	0.52
1:L:150:ILE:HG23	1:L:151:ASP:N	2.21	0.52
1:L:166:GLN:HG2	1:L:171:SER:O	2.10	0.52
1:L:167:ASP:HB3	1:L:170:ASP:OD1	2.10	0.52
1:L:210:ASN:O	1:L:211:ARG:HB3	2.09	0.51
1:L:59:PRO:HG2	1:L:62:PHE:HD2	1.74	0.51
2:H:223:LYS:HD3	2:H:227:VAL:HG13	1.93	0.50
2:H:30:LYS:HB3	2:H:74:THR:CG2	2.41	0.50
2:H:122:VAL:HG11	2:H:211:VAL:HG11	1.95	0.49
1:L:85:ASN:HA	1:L:102:THR:O	2.12	0.49
1:L:150:ILE:HG22	1:L:153:SER:O	2.14	0.48
2:H:60:TYR:CD1	2:H:60:TYR:N	2.81	0.48
2:H:91:THR:HG23	2:H:111:THR:HA	1.95	0.48
1:L:205:ILE:N	1:L:205:ILE:HD12	2.28	0.48
2:H:120:PRO:CA	2:H:148:TYR:HB3	2.43	0.48
2:H:91:THR:HA	2:H:110:VAL:O	2.14	0.48
1:L:155:ARG:HH12	1:L:157:ASN:HB3	1.78	0.48
1:L:179:LEU:HG	1:L:181:LEU:CD1	2.44	0.48
2:H:11:LEU:HD22	2:H:150:PRO:HG3	1.95	0.47
2:H:201:TRP:HA	2:H:203:PRO:HA	1.51	0.47
1:L:115:VAL:HG22	1:L:207:LYS:HG3	1.96	0.47
1:L:192:TYR:O	1:L:208:SER:HB2	2.15	0.47
2:H:73:ASP:O	2:H:73:ASP:OD1	2.34	0.46
2:H:122:VAL:HG13	2:H:220:VAL:HG21	1.96	0.46
2:H:130:ALA:O	2:H:132:GLN:N	2.49	0.46
1:L:13:ALA:O	1:L:107:LYS:N	2.45	0.46
1:L:36:TYR:O	1:L:86:TYR:HA	2.16	0.46
1:L:20:THR:HA	1:L:73:LEU:O	2.16	0.45
2:H:223:LYS:O	2:H:227:VAL:HG22	2.17	0.45
1:L:88:CYS:O	1:L:88:CYS:SG	2.73	0.45
1:L:136:LEU:N	1:L:136:LEU:HD22	2.31	0.45
2:H:181:SER:O	2:H:184:ASP:HB2	2.17	0.45
1:L:139:PHE:HE1	1:L:142:LYS:HA	1.82	0.45
1:L:198:HIS:CG	1:L:199:LYS:N	2.85	0.45
1:L:90:HIS:CD2	1:L:92:TRP:H	2.32	0.45
1:L:34:ALA:HB1	1:L:46:LEU:HD11	1.99	0.45
2:H:104:TRP:N	2:H:104:TRP:CD1	2.84	0.44
1:L:91:PHE:HA	1:L:96:TYR:CD1	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:16:ALA:O	2:H:86:LEU:HG	2.17	0.44
1:L:121:SER:OG	2:H:123:TYR:HB3	2.17	0.44
1:L:90:HIS:CD2	1:L:91:PHE:N	2.86	0.44
1:L:115:VAL:HG13	1:L:205:ILE:HG21	2.00	0.44
1:L:105:GLU:HG2	1:L:106:ILE:N	2.32	0.44
2:H:29:ILE:CG2	2:H:53:PRO:HG3	2.49	0.43
1:L:19:VAL:HG13	1:L:78:LEU:HD11	1.99	0.43
1:L:133:VAL:HG22	1:L:178:THR:OG1	2.18	0.43
1:L:108:ARG:NH2	1:L:111:ALA:HB2	2.33	0.43
2:H:12:VAL:HG21	2:H:86:LEU:CD1	2.47	0.43
1:L:59:PRO:HB2	1:L:61:ARG:HG2	2.01	0.43
1:L:19:VAL:HG11	1:L:78:LEU:HD11	2.00	0.43
1:L:5:THR:HG22	1:L:5:THR:O	2.19	0.42
1:L:4:MET:SD	1:L:90:HIS:HB3	2.59	0.42
2:H:137:VAL:HG12	2:H:194:VAL:O	2.19	0.42
2:H:158:TRP:CZ3	2:H:209:CYS:HB2	2.54	0.42
2:H:153:VAL:HG13	2:H:154:THR:N	2.33	0.42
1:L:104:LEU:HD12	1:L:104:LEU:C	2.40	0.42
2:H:4:LEU:HD21	2:H:98:ILE:HG23	2.01	0.41
2:H:124:PRO:HB2	2:H:224:ILE:HD13	2.01	0.41
1:L:31:ASN:HD22	1:L:51:ALA:HB3	1.85	0.41
1:L:39:LYS:HB2	1:L:39:LYS:HE3	1.75	0.41
1:L:118:PHE:CE2	1:L:135:PHE:CD2	3.08	0.41
1:L:54:LEU:HD11	1:L:58:VAL:HB	2.02	0.41
2:H:120:PRO:CB	2:H:148:TYR:HB3	2.50	0.41
2:H:122:VAL:O	2:H:222:LYS:HE2	2.21	0.41
2:H:115:ALA:HB3	2:H:149:PHE:CE1	2.55	0.40
1:L:166:GLN:HE21	1:L:171:SER:HB3	1.84	0.40
1:L:203:SER:HA	1:L:204:PRO:HD2	1.86	0.40
2:H:163:ASN:ND2	2:H:167:LEU:HD12	2.36	0.40
1:L:118:PHE:HE2	1:L:135:PHE:CD2	2.39	0.40
1:L:166:GLN:HG2	1:L:171:SER:C	2.41	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	L	209/211 (99%)	199 (95%)	9 (4%)	1 (0%)	29	68
2	H	214/216 (99%)	196 (92%)	14 (6%)	4 (2%)	8	36
All	All	423/427 (99%)	395 (93%)	23 (5%)	5 (1%)	13	48

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	150	ILE
2	H	129	SER
2	H	131	ALA
2	H	135	SER
2	H	203	PRO

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	L	185/186 (100%)	157 (85%)	28 (15%)	3	14
2	H	183/186 (98%)	149 (81%)	34 (19%)	1	8
All	All	368/372 (99%)	306 (83%)	62 (17%)	2	11

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	5	THR
1	L	7	THR
1	L	18	THR
1	L	22	THR
1	L	23	CYS
1	L	45	GLN
1	L	48	VAL

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Mol	Chain	Res	Type
1	L	81	GLU
1	L	90	HIS
1	L	94	THR
1	L	103	LYS
1	L	104	LEU
1	L	106	ILE
1	L	108	ARG
1	L	114	THR
1	L	122	SER
1	L	136	LEU
1	L	146	VAL
1	L	147	LYS
1	L	149	LYS
1	L	156	GLN
1	L	163	TRP
1	L	176	SER
1	L	188	ARG
1	L	197	THR
1	L	200	THR
1	L	210	ASN
1	L	211	ARG
2	H	2	VAL
2	H	3	GLN
2	H	12	VAL
2	H	18	VAL
2	H	23	SER
2	H	28	ASN
2	H	32	THR
2	H	40	ARG
2	H	50	ARG
2	H	57	ILE
2	H	65	GLN
2	H	73	ASP
2	H	77	ASN
2	H	89	GLU
2	H	102	LEU
2	H	109	LEU
2	H	118	THR
2	H	122	VAL
2	H	132	GLN
2	H	133	THR
2	H	136	MET

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Mol	Chain	Res	Type
2	H	144	LEU
2	H	152	PRO
2	H	153	VAL
2	H	197	SER
2	H	205	GLU
2	H	209	CYS
2	H	210	ASN
2	H	211	VAL
2	H	220	VAL
2	H	221	ASP
2	H	223	LYS
2	H	227	VAL
2	H	230	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	31	ASN
1	L	70	GLN
1	L	90	HIS
1	L	156	GLN
2	H	65	GLN
2	H	82	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers

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, 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	L	211/211 (100%)	-0.64	0 100 100	10, 20, 68, 90	0
2	H	216/216 (100%)	-0.57	7 (3%) 47 20	10, 20, 79, 90	0
All	All	427/427 (100%)	-0.61	7 (1%) 72 44	10, 20, 76, 90	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	129	SER	5.2
2	H	231	CYS	5.2
2	H	133	THR	4.8
2	H	132	GLN	4.0
2	H	184	ASP	2.4
2	H	131	ALA	2.3
2	H	1	GLU	2.1

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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.