



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 25, 2023 – 12:31 PM EDT

PDB ID : 5VSH
Title : CH1/Clambda Fab based on Pertuzumab
Authors : Hendle, J.
Deposited on : 2017-05-11
Resolution : 2.55 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 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 : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.35.1
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) : 2.35.1

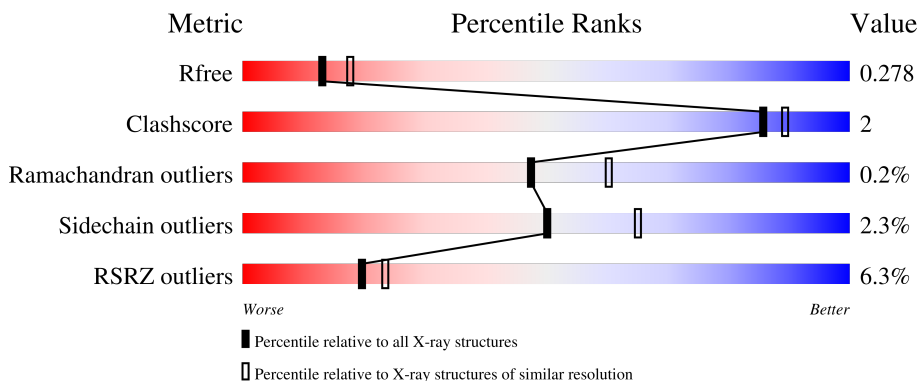
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.55 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.



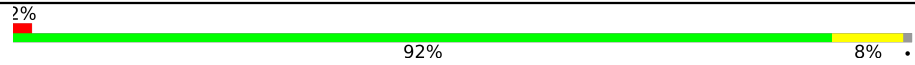
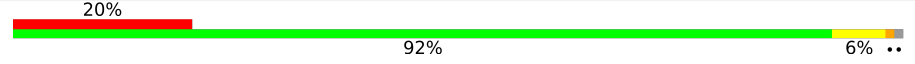

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1284 (2.56-2.52)
Clashscore	141614	1332 (2.56-2.52)
Ramachandran outliers	138981	1315 (2.56-2.52)
Sidechain outliers	138945	1315 (2.56-2.52)
RSRZ outliers	127900	1272 (2.56-2.52)

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 ≥ 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	219	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 87%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 3%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">89% 8%</p>
1	C	219	<div style="display: flex; align-items: center;"> <div style="width: 87%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 3%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">89% 8%</p>
1	E	219	<div style="display: flex; align-items: center;"> <div style="width: 21%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 67%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 7%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 3%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">21% 90% 7%</p>
1	H	219	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 90%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 5%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 3%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">92% 5%</p>
2	B	213	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 89%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="margin-left: 20px;">3% 92% 8%</p>

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Mol	Chain	Length	Quality of chain
2	D	213	 <p>2% 92% 8%</p>
2	F	213	 <p>20% 92% 6%</p>
2	L	213	 <p>% 90% 9%</p>

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 13404 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 CH1/Clambda Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	214	Total 1623	C 1030	N 273	O 313	S 7	0	2	0
1	C	214	Total 1600	C 1017	N 269	O 307	S 7	0	1	0
1	E	212	Total 1558	C 989	N 262	O 301	S 6	0	1	0
1	H	214	Total 1611	C 1022	N 272	O 310	S 7	0	1	0

- Molecule 2 is a protein called CH1/Clambda Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	213	Total 1625	C 1027	N 271	O 322	S 5	0	1	0
2	D	211	Total 1621	C 1023	N 266	O 327	S 5	0	5	0
2	F	211	Total 1573	C 992	N 264	O 312	S 5	0	0	0
2	L	213	Total 1636	C 1030	N 270	O 331	S 5	0	2	0

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0
3	E	1	Total O S 5 4 1	0	0
3	F	1	Total O S 5 4 1	0	0
3	H	1	Total O S 5 4 1	0	0
3	H	1	Total O S 5 4 1	0	0
3	L	1	Total O S 5 4 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	79	Total O 79 79	0	0
4	B	71	Total O 71 71	0	0

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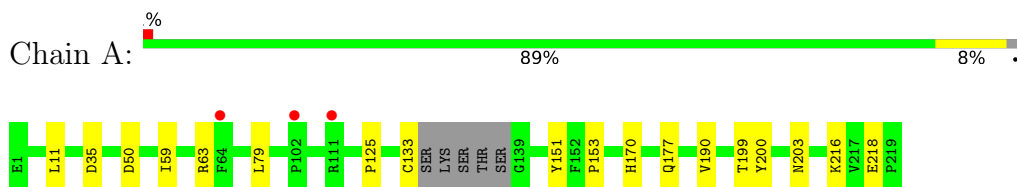
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	55	Total 55	O 55	0	0
4	D	77	Total 77	O 77	0	0
4	E	39	Total 39	O 39	0	0
4	F	49	Total 49	O 49	0	0
4	H	66	Total 66	O 66	0	0
4	L	71	Total 71	O 71	0	0

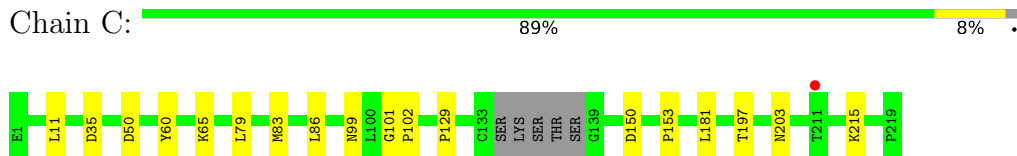
3 Residue-property plots [i](#)

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.

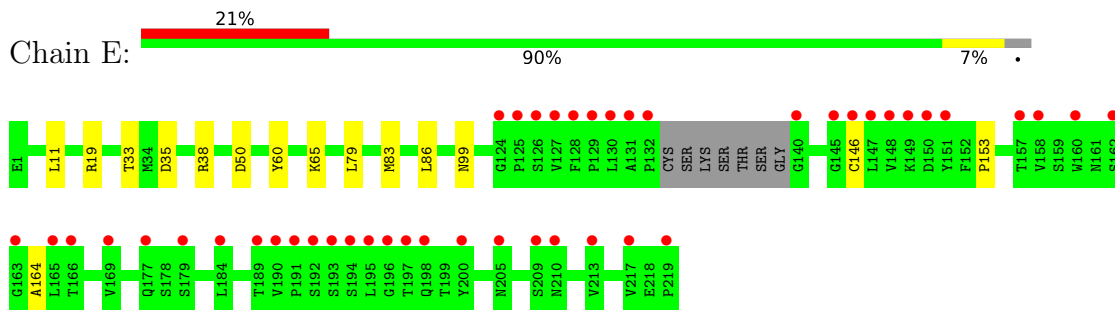
- Molecule 1: CH1/Clambda Fab heavy chain



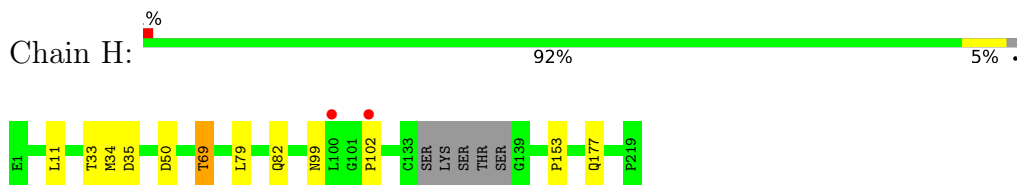
- Molecule 1: CH1/Clambda Fab heavy chain



- Molecule 1: CH1/Clambda Fab heavy chain

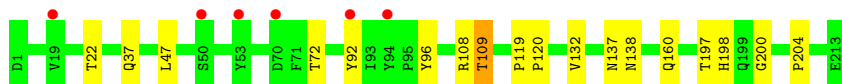


- Molecule 1: CH1/Clambda Fab heavy chain

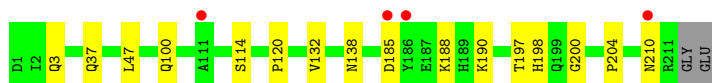
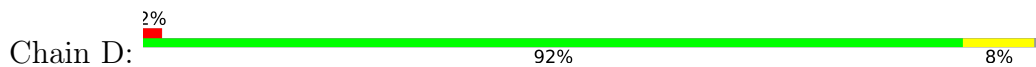


- Molecule 2: CH1/Clambda Fab light chain

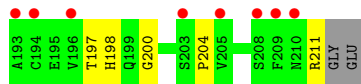
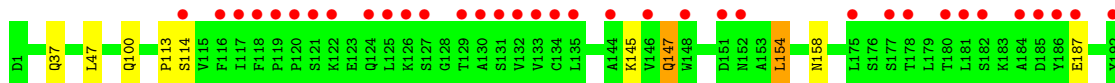
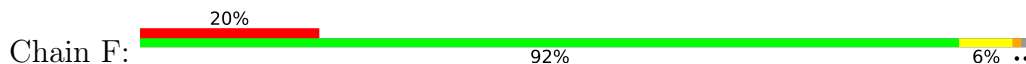




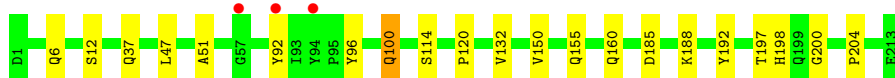
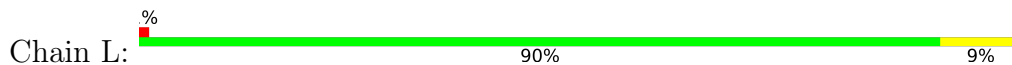
- Molecule 2: CH1/Clambda Fab light chain



- Molecule 2: CH1/Clambda Fab light chain



- Molecule 2: CH1/Clambda Fab light chain



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	137.53Å 106.21Å 156.77Å 90.00° 117.48° 90.00°	Depositor
Resolution (Å)	25.70 – 2.55 42.21 – 2.55	Depositor EDS
% Data completeness (in resolution range)	93.1 (25.70-2.55) 93.1 (42.21-2.55)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.20 (at 2.54Å)	Xtrriage
Refinement program	BUSTER 2.11.5	Depositor
R, R_{free}	0.206 , 0.255 0.226 , 0.278	Depositor DCC
R_{free} test set	3081 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	30.1	Xtrriage
Anisotropy	0.175	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 52.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.022 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	13404	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.91% 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](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SO4

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	0.42	0/1670	0.65	0/2277
1	C	0.51	1/1644 (0.1%)	0.69	1/2245 (0.0%)
1	E	0.39	0/1602	0.63	0/2191
1	H	0.43	0/1655	0.66	0/2258
2	B	0.37	0/1667	0.63	0/2271
2	D	0.39	0/1675	0.64	0/2285
2	F	0.39	0/1610	0.64	0/2199
2	L	0.39	0/1681	0.62	0/2291
All	All	0.41	1/13204 (0.0%)	0.64	1/18017 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	102	PRO	N-CD	5.12	1.55	1.47

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	101	GLY	C-N-CD	5.49	139.93	128.40

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	1623	0	1580	9	0
1	C	1600	0	1540	7	0
1	E	1558	0	1451	5	0
1	H	1611	0	1558	7	0
2	B	1625	0	1551	10	0
2	D	1621	0	1526	7	0
2	F	1573	0	1461	6	0
2	L	1636	0	1553	11	0
3	A	10	0	0	0	0
3	B	5	0	0	0	0
3	C	5	0	0	0	0
3	D	5	0	0	0	0
3	E	5	0	0	0	0
3	F	5	0	0	0	0
3	H	10	0	0	0	0
3	L	5	0	0	0	0
4	A	79	0	0	0	0
4	B	71	0	0	0	0
4	C	55	0	0	0	0
4	D	77	0	0	0	0
4	E	39	0	0	0	0
4	F	49	0	0	0	0
4	H	66	0	0	0	0
4	L	71	0	0	0	0
All	All	13404	0	12220	56	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 2.

All (56) 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:L:150:VAL:HG12	2:L:155:GLN:NE2	1.89	0.87
1:H:69:THR:HG23	1:H:82:GLN:HB3	1.64	0.79
2:F:147:GLN:HG3	2:F:154:LEU:HD11	1.74	0.68
1:H:34:MET:HB3	1:H:79:LEU:HD11	1.78	0.65
1:C:11:LEU:HB2	1:C:153:PRO:HG3	1.81	0.61
1:C:60:TYR:HB2	1:C:65:LYS:HG2	1.84	0.60
1:E:11:LEU:HB2	1:E:153:PRO:HG3	1.84	0.60
1:C:129:PRO:HD3	1:C:215:LYS:HE2	1.85	0.57
2:L:197:THR:HG22	2:L:204:PRO:HG3	1.87	0.57
1:A:199:THR:HG23	1:A:216:LYS:HE3	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:60:TYR:HB2	1:E:65:LYS:HG2	1.87	0.57
2:B:197:THR:HG22	2:B:204:PRO:HG3	1.87	0.56
1:A:11:LEU:HB2	1:A:153:PRO:HG3	1.88	0.55
2:D:197:THR:HG22	2:D:204:PRO:HG3	1.89	0.54
2:F:197:THR:HG22	2:F:204:PRO:HG3	1.89	0.54
2:F:198:HIS:CD2	2:F:200:GLY:H	2.25	0.54
2:B:120:PRO:HD3	2:B:132:VAL:HG22	1.91	0.53
2:L:120:PRO:HD3	2:L:132:VAL:HG22	1.92	0.51
2:D:120:PRO:HD3	2:D:132:VAL:HG22	1.93	0.51
1:H:11:LEU:HB2	1:H:153:PRO:HG3	1.93	0.51
1:A:50:ASP:OD1	1:A:59:ILE:HB	2.11	0.51
2:D:3[B]:GLN:HE21	2:D:3[B]:GLN:HA	1.75	0.50
1:C:83:MET:HE2	1:C:86:LEU:HD21	1.95	0.49
2:F:187:GLU:HA	2:F:211:ARG:HH12	1.77	0.49
2:D:190:LYS:O	2:D:210:ASN:HA	2.14	0.48
1:E:33:THR:HB	1:E:99:ASN:ND2	2.28	0.48
1:H:33:THR:HB	1:H:99:ASN:ND2	2.30	0.46
1:H:177:GLN:HG2	2:L:160:GLN:HE22	1.80	0.46
2:B:198[A]:HIS:CD2	2:B:200:GLY:H	2.34	0.45
2:B:22:THR:HG22	2:B:72:THR:HG22	1.98	0.45
2:L:198[A]:HIS:CD2	2:L:200:GLY:H	2.34	0.45
1:C:83:MET:HB3	1:C:86:LEU:HD21	1.98	0.45
1:E:83:MET:HB3	1:E:86:LEU:HD21	1.99	0.45
1:A:216:LYS:HE2	1:A:218:GLU:HG2	1.98	0.45
1:A:133:CYS:SG	2:B:119:PRO:HG3	2.58	0.44
2:D:198[A]:HIS:CD2	2:D:200:GLY:H	2.34	0.44
2:L:37:GLN:HB2	2:L:47:LEU:HD11	2.00	0.43
1:A:170:HIS:CD2	2:B:137:ASN:HD21	2.37	0.43
2:L:150:VAL:HG23	2:L:192:TYR:CE1	2.54	0.43
1:E:164:ALA:HB1	1:H:102:PRO:HD2	2.01	0.43
2:L:185[B]:ASP:HA	2:L:188:LYS:HE3	2.01	0.42
1:A:125:PRO:HB3	1:A:151:TYR:HB3	2.02	0.42
1:A:177:GLN:HG2	2:B:160:GLN:HE22	1.83	0.42
2:B:37:GLN:HB2	2:B:47:LEU:HD11	2.00	0.42
2:D:37:GLN:HB2	2:D:47:LEU:HD11	2.00	0.42
1:C:197:THR:HG23	2:L:12:SER:HB2	2.02	0.41
2:F:37:GLN:HB2	2:F:47:LEU:HD11	2.01	0.41
2:B:108:ARG:NH1	2:B:109:THR:HG22	2.35	0.41
2:B:108:ARG:HH11	2:B:109:THR:HG22	1.86	0.41
2:D:185[B]:ASP:HA	2:D:188:LYS:HE3	2.03	0.41
2:L:185[A]:ASP:HA	2:L:188:LYS:HE3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:150:ASP:HB3	1:C:181:LEU:HD13	2.02	0.41
2:F:113:PRO:HD3	2:F:198:HIS:CD2	2.56	0.41
1:H:34:MET:HG3	1:H:79:LEU:HD21	2.03	0.41
1:A:190:VAL:HG11	1:A:200:TYR:CE1	2.56	0.40
2:L:6:GLN:H	2:L:100:GLN:NE2	2.20	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	212/219 (97%)	209 (99%)	3 (1%)	0	100	100
1	C	211/219 (96%)	206 (98%)	5 (2%)	0	100	100
1	E	209/219 (95%)	205 (98%)	4 (2%)	0	100	100
1	H	211/219 (96%)	207 (98%)	4 (2%)	0	100	100
2	B	212/213 (100%)	207 (98%)	4 (2%)	1 (0%)	29	40
2	D	214/213 (100%)	207 (97%)	6 (3%)	1 (0%)	29	40
2	F	209/213 (98%)	200 (96%)	8 (4%)	1 (0%)	29	40
2	L	213/213 (100%)	206 (97%)	6 (3%)	1 (0%)	29	40
All	All	1691/1728 (98%)	1647 (97%)	40 (2%)	4 (0%)	47	60

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	F	158	ASN
2	B	138	ASN
2	D	138	ASN
2	L	51	ALA

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	180/184 (98%)	176 (98%)	4 (2%)	52	66
1	C	174/184 (95%)	169 (97%)	5 (3%)	42	57
1	E	162/184 (88%)	156 (96%)	6 (4%)	34	46
1	H	177/184 (96%)	174 (98%)	3 (2%)	60	75
2	B	178/187 (95%)	175 (98%)	3 (2%)	60	75
2	D	178/187 (95%)	175 (98%)	3 (2%)	60	75
2	F	165/187 (88%)	160 (97%)	5 (3%)	41	55
2	L	182/187 (97%)	178 (98%)	4 (2%)	52	66
All	All	1396/1484 (94%)	1363 (98%)	33 (2%)	50	64

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	ASP
1	A	63	ARG
1	A	79	LEU
1	A	203	ASN
2	B	92	TYR
2	B	96	TYR
2	B	109	THR
1	C	35	ASP
1	C	50	ASP
1	C	79	LEU
1	C	99	ASN
1	C	203	ASN
2	D	100[A]	GLN
2	D	100[B]	GLN
2	D	114	SER
1	E	19	ARG
1	E	35	ASP
1	E	38	ARG
1	E	50	ASP

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Mol	Chain	Res	Type
1	E	79	LEU
1	E	146	CYS
2	F	100	GLN
2	F	114	SER
2	F	145	LYS
2	F	147	GLN
2	F	154	LEU
1	H	35	ASP
1	H	50	ASP
1	H	69	THR
2	L	92	TYR
2	L	96	TYR
2	L	100	GLN
2	L	114	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	205	ASN
2	B	137	ASN
2	B	138	ASN
2	B	160	GLN
1	E	99	ASN
2	F	3	GLN
2	F	160	GLN
2	F	198	HIS
2	L	3	GLN
2	L	100	GLN
2	L	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](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

10 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	SO4	A	301	-	4,4,4	0.16	0	6,6,6	0.22	0
3	SO4	E	301	-	4,4,4	0.12	0	6,6,6	0.08	0
3	SO4	A	302	-	4,4,4	0.21	0	6,6,6	0.15	0
3	SO4	H	301	-	4,4,4	0.20	0	6,6,6	0.07	0
3	SO4	H	302	-	4,4,4	0.12	0	6,6,6	0.07	0
3	SO4	B	301	-	4,4,4	0.14	0	6,6,6	0.21	0
3	SO4	L	301	-	4,4,4	0.19	0	6,6,6	0.13	0
3	SO4	C	301	-	4,4,4	0.15	0	6,6,6	0.11	0
3	SO4	D	301	-	4,4,4	0.15	0	6,6,6	0.16	0
3	SO4	F	301	-	4,4,4	0.12	0	6,6,6	0.09	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

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	214/219 (97%)	0.02	3 (1%) 75 81	9, 22, 41, 59	0
1	C	214/219 (97%)	0.06	1 (0%) 91 94	6, 27, 44, 58	0
1	E	212/219 (96%)	1.07	45 (21%) 0 0	9, 36, 87, 96	0
1	H	214/219 (97%)	0.12	2 (0%) 84 88	9, 23, 45, 53	0
2	B	213/213 (100%)	0.11	6 (2%) 53 60	12, 32, 51, 60	0
2	D	211/213 (99%)	0.03	4 (1%) 66 73	5, 25, 51, 65	0
2	F	211/213 (99%)	1.14	43 (20%) 1 1	12, 38, 90, 96	0
2	L	213/213 (100%)	0.08	3 (1%) 75 81	10, 26, 47, 55	0
All	All	1702/1728 (98%)	0.33	107 (6%) 20 23	5, 28, 73, 96	0

All (107) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	184	ALA	8.9
1	E	125	PRO	7.9
2	F	127	SER	6.1
2	F	121	SER	5.8
1	E	213	VAL	5.7
2	F	131	SER	5.6
1	E	140	GLY	5.4
1	E	196	GLY	5.4
1	E	194	SER	5.3
2	F	194	CYS	5.2
1	E	151	TYR	5.2
1	E	217	VAL	5.1
2	F	182	SER	5.0
2	F	130	ALA	4.9
1	E	158	VAL	4.9
1	H	102	PRO	4.8

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Mol	Chain	Res	Type	RSRZ
2	B	92	TYR	4.5
1	E	160	TRP	4.5
2	F	186	TYR	4.5
2	F	117	ILE	4.4
1	E	146	CYS	4.3
2	F	122	LYS	4.2
1	E	126	SER	4.2
2	F	208	SER	4.2
1	E	150	ASP	4.2
2	F	120	PRO	4.2
1	E	166	THR	4.2
2	F	133	VAL	4.1
2	F	132	VAL	4.1
1	E	132	PRO	4.0
2	F	185	ASP	4.0
2	F	126	LYS	4.0
2	F	118	PHE	3.9
2	F	209	PHE	3.9
1	E	198	GLN	3.8
1	E	193	SER	3.8
1	E	148	VAL	3.7
2	F	134	CYS	3.7
2	F	196	VAL	3.6
1	E	191	PRO	3.5
1	E	200	TYR	3.5
1	E	165	LEU	3.5
2	F	181	LEU	3.4
2	F	152	ASN	3.4
1	E	131	ALA	3.4
1	E	129	PRO	3.4
1	E	127	VAL	3.4
2	F	148	TRP	3.3
2	F	129	THR	3.3
1	E	128	PHE	3.3
2	L	92	TYR	3.3
1	E	195	LEU	3.2
1	E	147	LEU	3.2
1	E	192	SER	3.2
1	E	124	GLY	3.1
2	F	210	ASN	3.1
2	F	177	SER	3.0
1	E	149	LYS	3.0

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Mol	Chain	Res	Type	RSRZ
2	F	205	VAL	3.0
1	E	219	PRO	2.9
2	F	124	GLN	2.9
1	A	102	PRO	2.9
1	E	162	SER	2.9
2	F	178	THR	2.9
1	E	209	SER	2.9
2	F	187	GLU	2.8
1	E	179	SER	2.8
2	F	193	ALA	2.7
1	E	163	GLY	2.7
2	F	114	SER	2.7
2	F	203	SER	2.7
1	A	64	PHE	2.7
1	E	210	ASN	2.7
1	E	190	VAL	2.7
2	D	111	ALA	2.6
2	F	135	LEU	2.6
1	E	130	LEU	2.6
2	F	151	ASP	2.6
2	B	19	VAL	2.6
2	F	125	LEU	2.6
1	E	189	THR	2.5
2	F	144	ALA	2.5
1	E	145	GLY	2.5
2	F	116	PHE	2.5
1	H	100	LEU	2.5
1	A	111	ARG	2.4
1	E	169	VAL	2.4
2	F	192	TYR	2.4
1	E	177	GLN	2.4
2	F	119	PRO	2.4
2	B	50	SER	2.4
2	F	146	VAL	2.3
2	F	180	THR	2.3
1	E	205	ASN	2.3
2	B	53	TYR	2.3
2	D	185[A]	ASP	2.2
1	C	211	THR	2.2
2	B	94	TYR	2.2
1	E	197	THR	2.2
2	D	210	ASN	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	157	THR	2.2
2	B	70	ASP	2.1
2	F	175	LEU	2.1
1	E	184	LEU	2.1
2	D	186	TYR	2.1
2	L	94	TYR	2.0
2	L	57	GLY	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 monosaccharides 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. 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	B-factors(Å ²)	Q<0.9
3	SO4	A	302	5/5	0.80	0.24	77,77,78,79	0
3	SO4	D	301	5/5	0.86	0.21	98,98,98,98	0
3	SO4	H	302	5/5	0.87	0.21	93,93,94,95	0
3	SO4	F	301	5/5	0.89	0.27	114,114,114,115	0
3	SO4	B	301	5/5	0.90	0.13	73,73,74,74	0
3	SO4	A	301	5/5	0.96	0.14	34,38,39,41	0
3	SO4	C	301	5/5	0.97	0.18	82,82,83,84	0
3	SO4	E	301	5/5	0.97	0.17	75,75,76,76	0
3	SO4	L	301	5/5	0.97	0.12	64,65,65,65	0
3	SO4	H	301	5/5	0.98	0.15	46,48,48,50	0

6.5 Other polymers [i](#)

There are no such residues in this entry.