



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 29, 2024 – 08:27 pm GMT

PDB ID : 8CBD
Title : SARS-CoV-2 Delta-RBD complexed with BA.4/5-1 and EY6A Fabs
Authors : Zhou, D.; Ren, J.; Stuart, D.I.
Deposited on : 2023-01-25
Resolution : 3.52 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 : 1.8.4, 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

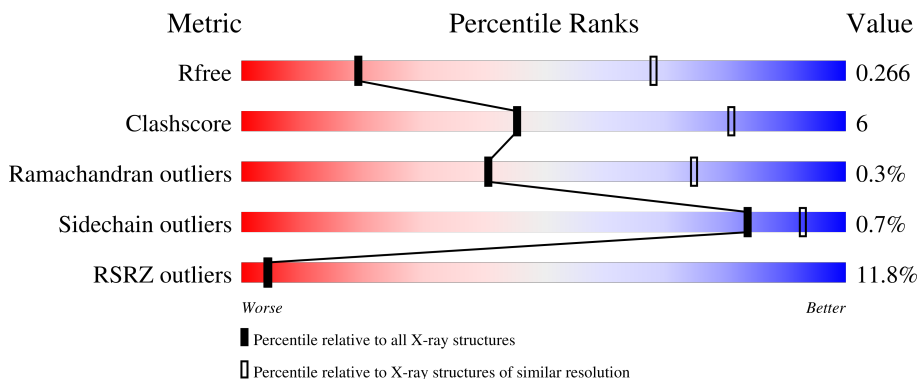
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.52 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	1161 (3.60-3.44)
Clashscore	141614	1244 (3.60-3.44)
Ramachandran outliers	138981	1206 (3.60-3.44)
Sidechain outliers	138945	1207 (3.60-3.44)
RSRZ outliers	127900	1080 (3.60-3.44)

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	R	202	<div style="display: flex; align-items: center;"> <div style="width: 10%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 79%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">79% 17% .</p>
1	X	202	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 18%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">4% 78% 18% .</p>
1	Y	202	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">2% 78% 17% .</p>
2	A	222	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 81%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 16%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">2% 81% 16% .</p>
2	C	222	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 80%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">12% 80% 17% .</p>

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Mol	Chain	Length	Quality of chain
2	H	222	
3	B	214	
3	D	214	
3	L	214	
4	E	226	
4	G	226	
4	J	226	
5	F	215	
5	I	215	
5	K	215	

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
6	NAG	R	601	-	-	-	X

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 24092 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 Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	R	194	1539	985	260	286	8	0	0	0
1	X	194	1539	985	260	286	8	0	0	0
1	Y	194	1539	985	260	286	8	0	0	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	327	HIS	-	expression tag	UNP P0DTC2
R	328	HIS	-	expression tag	UNP P0DTC2
R	329	HIS	-	expression tag	UNP P0DTC2
R	330	HIS	-	expression tag	UNP P0DTC2
R	331	HIS	-	expression tag	UNP P0DTC2
R	332	HIS	-	expression tag	UNP P0DTC2
R	452	ARG	LEU	variant	UNP P0DTC2
R	478	LYS	THR	variant	UNP P0DTC2
R	527	LYS	-	expression tag	UNP P0DTC2
R	528	LYS	-	expression tag	UNP P0DTC2
X	327	HIS	-	expression tag	UNP P0DTC2
X	328	HIS	-	expression tag	UNP P0DTC2
X	329	HIS	-	expression tag	UNP P0DTC2
X	330	HIS	-	expression tag	UNP P0DTC2
X	331	HIS	-	expression tag	UNP P0DTC2
X	332	HIS	-	expression tag	UNP P0DTC2
X	452	ARG	LEU	variant	UNP P0DTC2
X	478	LYS	THR	variant	UNP P0DTC2
X	527	LYS	-	expression tag	UNP P0DTC2
X	528	LYS	-	expression tag	UNP P0DTC2
Y	327	HIS	-	expression tag	UNP P0DTC2
Y	328	HIS	-	expression tag	UNP P0DTC2
Y	329	HIS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
Y	330	HIS	-	expression tag	UNP P0DTC2
Y	331	HIS	-	expression tag	UNP P0DTC2
Y	332	HIS	-	expression tag	UNP P0DTC2
Y	452	ARG	LEU	variant	UNP P0DTC2
Y	478	LYS	THR	variant	UNP P0DTC2
Y	527	LYS	-	expression tag	UNP P0DTC2
Y	528	LYS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called BA.4/5-1 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	216	Total	C	N	O	S	0	0	0
			1599	1016	258	320	5			
2	A	216	Total	C	N	O	S	0	0	0
			1599	1016	258	320	5			
2	C	216	Total	C	N	O	S	0	0	0
			1599	1016	258	320	5			

- Molecule 3 is a protein called BA.4/5-1 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	213	Total	C	N	O	S	0	0	0
			1639	1027	270	338	4			
3	B	213	Total	C	N	O	S	0	0	0
			1639	1027	270	338	4			
3	D	213	Total	C	N	O	S	0	0	0
			1639	1027	270	338	4			

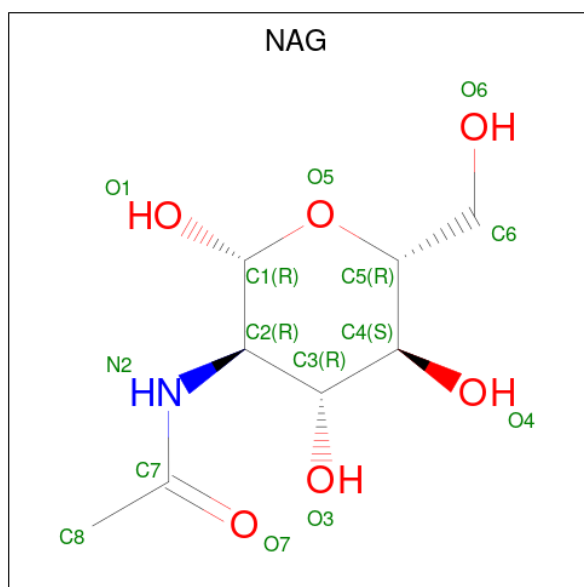
- Molecule 4 is a protein called EY6A heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	214	Total	C	N	O	S	0	0	0
			1631	1038	272	315	6			
4	G	214	Total	C	N	O	S	0	0	0
			1631	1038	272	315	6			
4	J	214	Total	C	N	O	S	0	0	0
			1631	1038	272	315	6			

- Molecule 5 is a protein called EY6A light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	212	Total	C	N	O	S	0	0	0
			1618	1012	270	331	5			
5	I	212	Total	C	N	O	S	0	0	0
			1618	1012	270	331	5			
5	K	212	Total	C	N	O	S	0	0	0
			1618	1012	270	331	5			

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

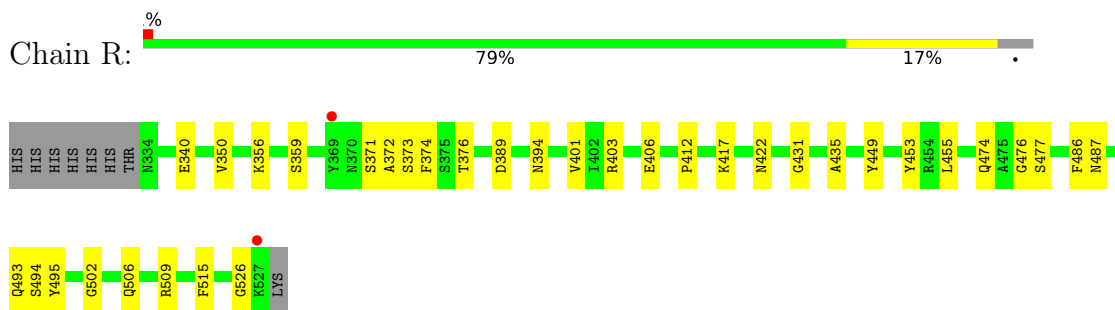


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	R	1	Total	C	N	O	0	0
			14	8	1	5		

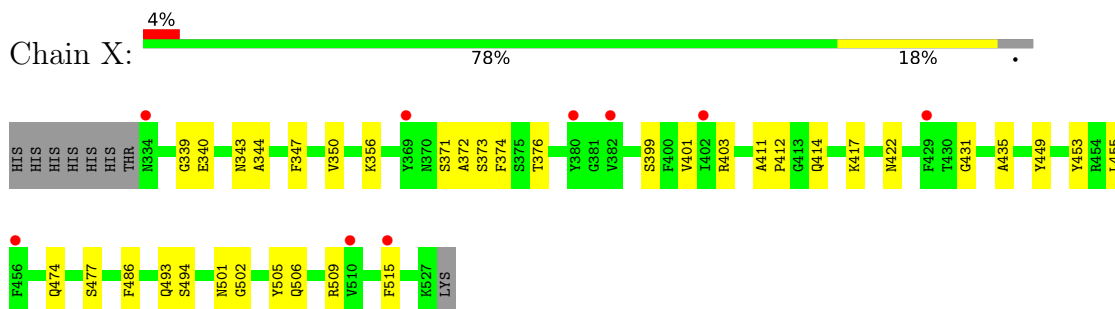
3 Residue-property plots [i](#)

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.

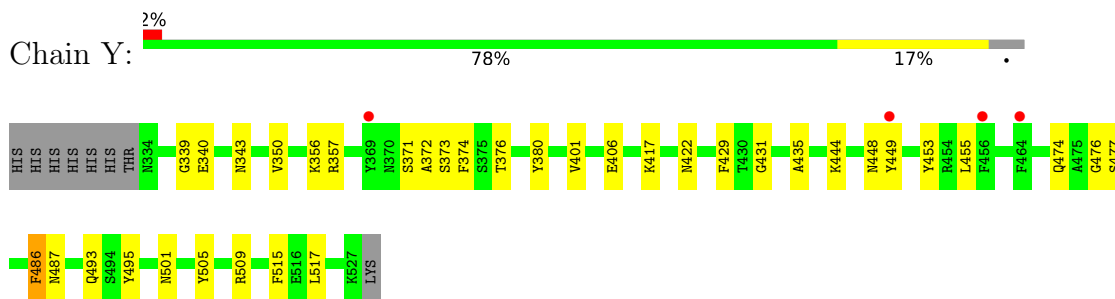
- Molecule 1: Spike protein S1



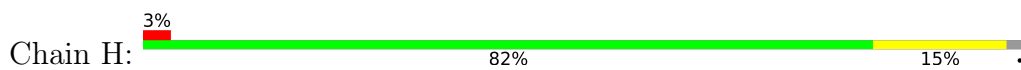
- Molecule 1: Spike protein S1

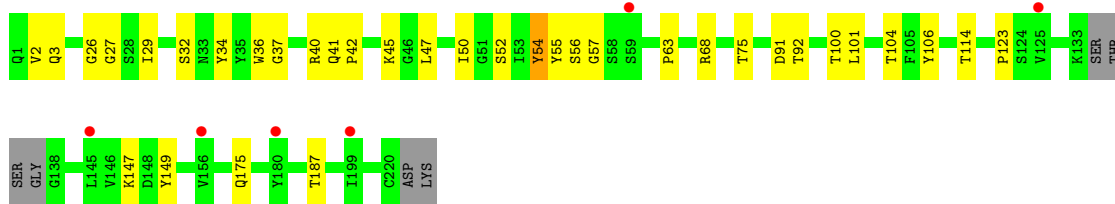


- Molecule 1: Spike protein S1

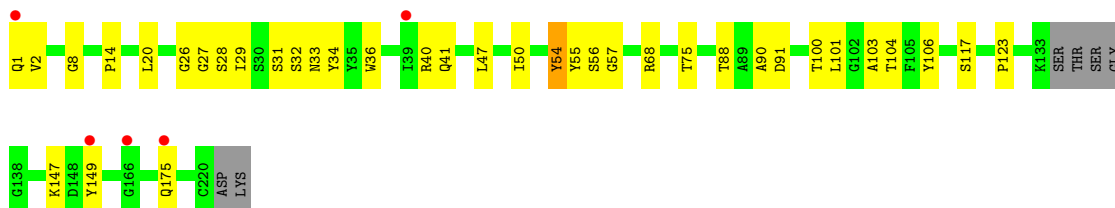
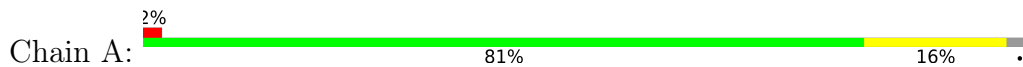


- Molecule 2: BA.4/5-1 heavy chain

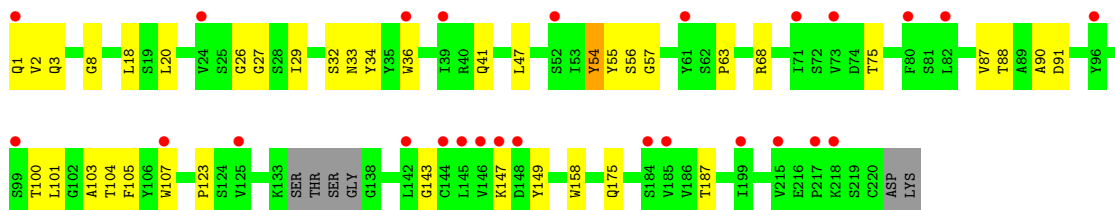
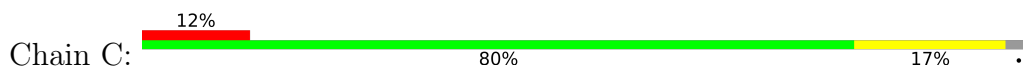




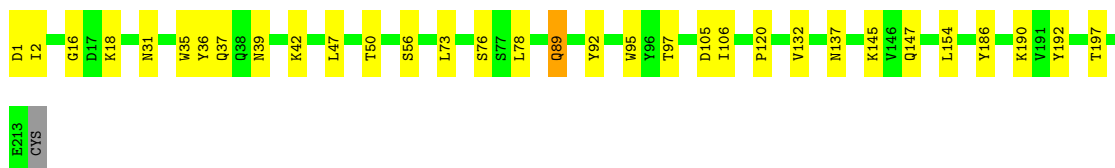
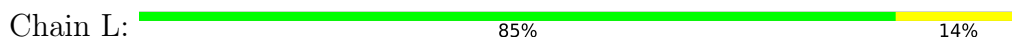
- Molecule 2: BA.4/5-1 heavy chain



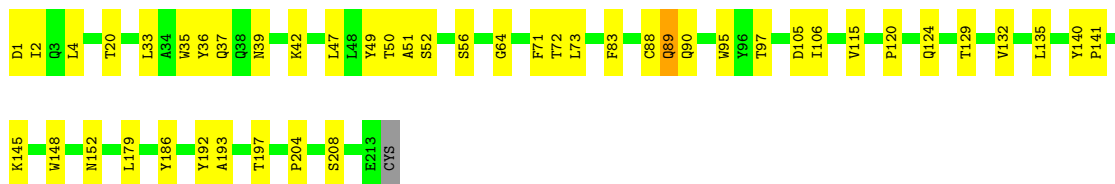
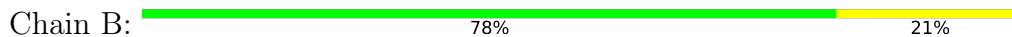
- Molecule 2: BA.4/5-1 heavy chain



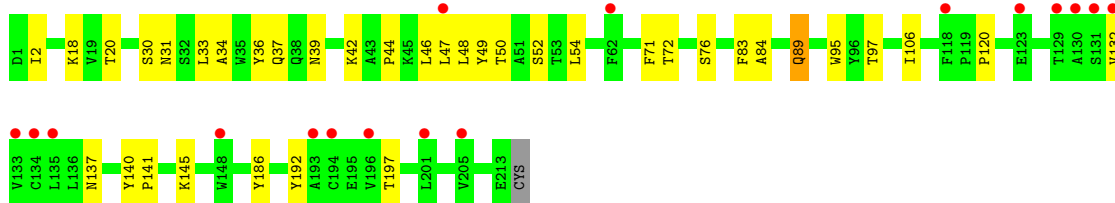
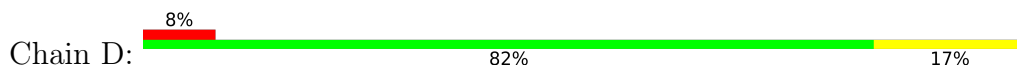
- Molecule 3: BA.4/5-1 light chain



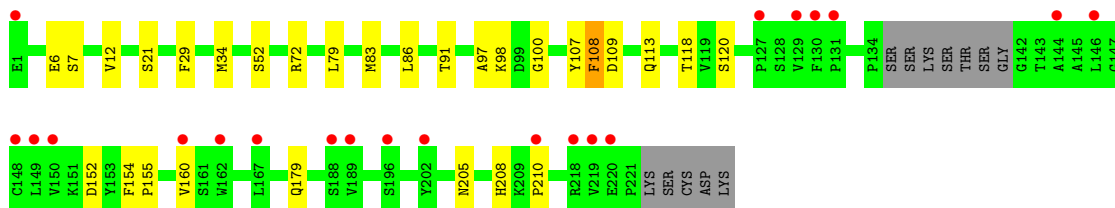
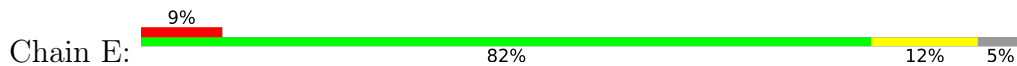
- Molecule 3: BA.4/5-1 light chain



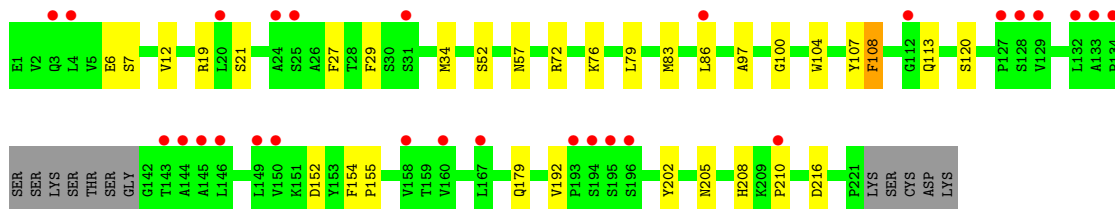
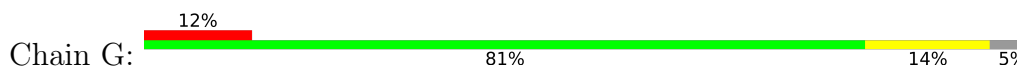
- Molecule 3: BA.4/5-1 light chain



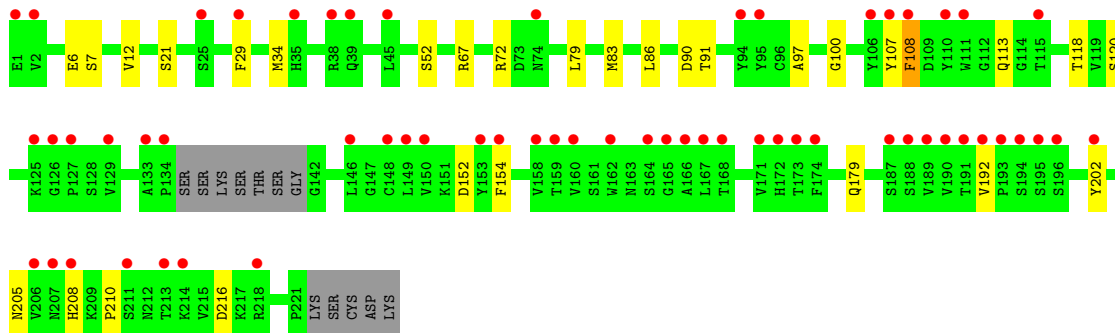
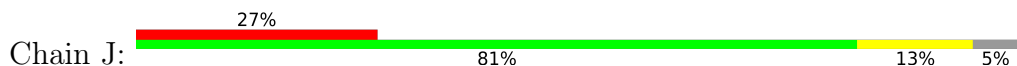
- Molecule 4: EY6A heavy chain



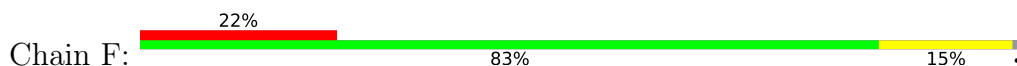
- Molecule 4: EY6A heavy chain

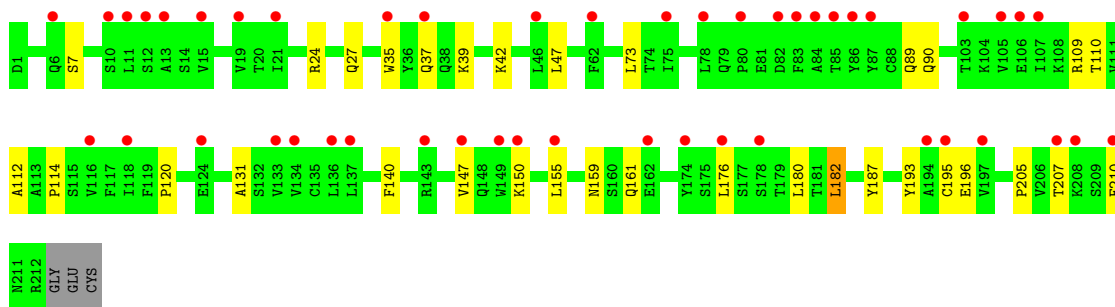


- Molecule 4: EY6A heavy chain

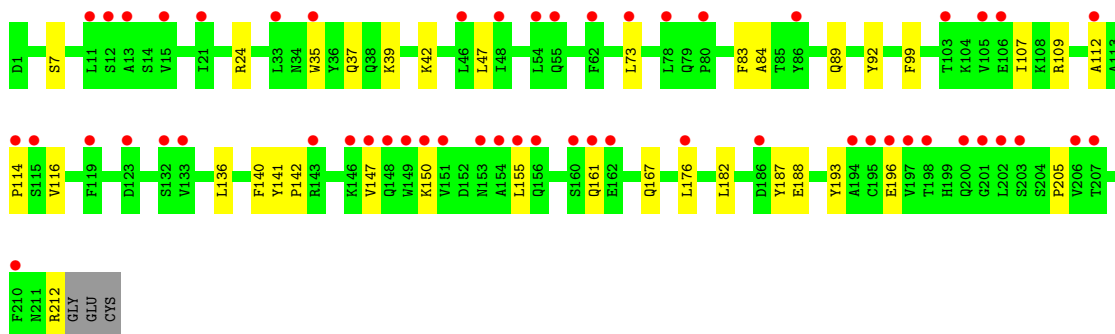
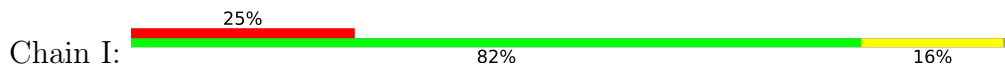


- Molecule 5: EY6A light chain

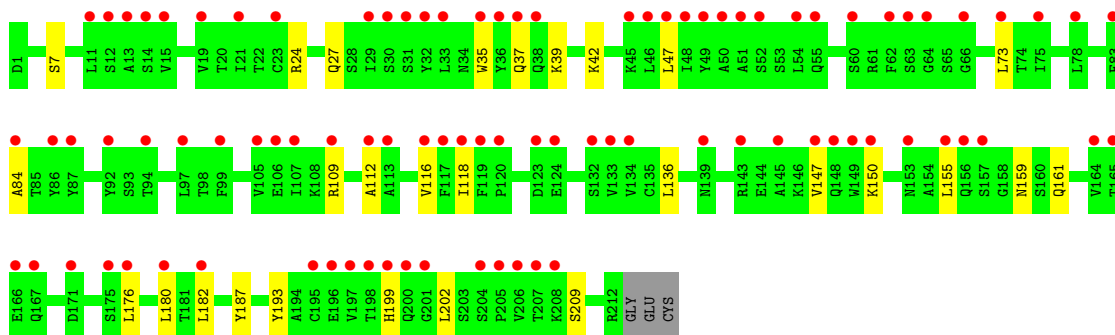
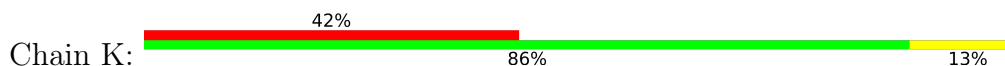




• Molecule 5: EY6A light chain



• Molecule 5: EY6A 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	242.05Å 139.37Å 168.53Å 90.00° 115.58° 90.00°	Depositor
Resolution (Å)	74.69 – 3.52 74.69 – 3.52	Depositor EDS
% Data completeness (in resolution range)	99.1 (74.69-3.52) 99.3 (74.69-3.52)	Depositor EDS
R_{merge}	0.33	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.04 (at 3.49Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.218 , 0.266 0.221 , 0.266	Depositor DCC
R_{free} test set	3027 reflections (4.85%)	wwPDB-VP
Wilson B-factor (Å ²)	123.4	Xtrriage
Anisotropy	0.345	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 128.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.37$, $\langle L^2 \rangle = 0.21$	Xtrriage
Estimated twinning fraction	0.127 for 1/2*h-3/2*k,-1/2*h-1/2*k,-1/2*h +1/2*k-1 0.146 for 1/2*h+3/2*k,1/2*h-1/2*k,-1/2*h- 1/2*k-1	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	24092	wwPDB-VP
Average B, all atoms (Å ²)	167.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.17% 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

5.1 Standard geometry

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

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	R	0.29	0/1582	0.49	0/2150
1	X	0.29	0/1582	0.49	0/2150
1	Y	0.29	0/1582	0.50	0/2150
2	A	0.27	0/1640	0.50	0/2242
2	C	0.27	0/1640	0.49	0/2242
2	H	0.27	0/1640	0.49	0/2242
3	B	0.28	0/1675	0.52	0/2278
3	D	0.27	0/1675	0.51	0/2278
3	L	0.27	0/1675	0.52	0/2278
4	E	0.25	0/1673	0.49	0/2280
4	G	0.26	0/1673	0.49	0/2280
4	J	0.25	0/1673	0.49	0/2280
5	F	0.27	0/1651	0.51	0/2241
5	I	0.28	0/1651	0.52	0/2241
5	K	0.26	0/1651	0.51	0/2241
All	All	0.27	0/24663	0.50	0/33573

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	R	1539	0	1455	21	2
1	X	1539	0	1456	23	0
1	Y	1539	0	1456	24	0
2	A	1599	0	1571	21	0
2	C	1599	0	1571	25	0
2	H	1599	0	1571	21	0
3	B	1639	0	1580	31	0
3	D	1639	0	1580	27	0
3	L	1639	0	1580	24	0
4	E	1631	0	1586	17	0
4	G	1631	0	1586	18	2
4	J	1631	0	1586	17	0
5	F	1618	0	1582	18	0
5	I	1618	0	1582	22	0
5	K	1618	0	1582	16	0
6	R	14	0	13	0	0
All	All	24092	0	23337	303	2

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 6.

All (303) 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)
5:I:196:GLU:HG3	5:I:205:PRO:HB3	1.64	0.80
5:F:196:GLU:HG3	5:F:205:PRO:HB3	1.65	0.77
5:F:120:PRO:HB3	5:F:210:PHE:CZ	2.24	0.73
2:H:63:PRO:HD2	3:L:95:TRP:CD1	2.23	0.72
5:I:37:GLN:HB2	5:I:47:LEU:HD11	1.71	0.72
3:L:36:TYR:HE1	3:L:89:GLN:HG2	1.54	0.71
2:H:147:LYS:NZ	2:H:175:GLN:OE1	2.23	0.71
1:R:340:GLU:OE1	1:R:356:LYS:NZ	2.25	0.69
2:H:2:VAL:HA	2:H:26:GLY:HA3	1.73	0.69
5:K:37:GLN:HB2	5:K:47:LEU:HD11	1.75	0.69
2:C:147:LYS:NZ	2:C:175:GLN:OE1	2.24	0.69
5:F:37:GLN:HB2	5:F:47:LEU:HD11	1.74	0.69
2:C:2:VAL:HA	2:C:26:GLY:HA3	1.75	0.67
2:C:63:PRO:HD2	3:D:95:TRP:CD1	2.30	0.67
3:L:36:TYR:CE1	3:L:89:GLN:HG2	2.32	0.64
4:J:6:GLU:H	4:J:113:GLN:HE22	1.44	0.64
1:Y:340:GLU:OE1	1:Y:356:LYS:NZ	2.31	0.64
4:E:6:GLU:H	4:E:113:GLN:HE22	1.46	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:6:GLU:H	4:G:113:GLN:HE22	1.46	0.64
5:I:141:TYR:CD1	5:I:142:PRO:HA	2.33	0.64
3:D:36:TYR:HE1	3:D:89:GLN:HG2	1.63	0.64
3:L:120:PRO:HD3	3:L:132:VAL:HG22	1.81	0.63
3:B:1:ASP:HB2	3:B:95:TRP:CZ3	2.34	0.63
3:D:30:SER:OG	3:D:31:ASN:N	2.32	0.63
2:A:2:VAL:HA	2:A:26:GLY:HA3	1.81	0.62
4:J:7:SER:OG	4:J:21:SER:OG	2.15	0.62
2:A:147:LYS:NZ	2:A:175:GLN:OE1	2.31	0.62
3:D:48:LEU:HD23	3:D:54:LEU:HA	1.81	0.62
4:G:152:ASP:OD1	4:G:179:GLN:NE2	2.33	0.60
4:E:100:GLY:HA3	4:E:107:TYR:CZ	2.36	0.60
3:B:36:TYR:HE1	3:B:89:GLN:HG2	1.65	0.60
1:Y:449:TYR:CE2	2:C:27:GLY:HA2	2.37	0.60
4:J:52:SER:O	4:J:72:ARG:NH1	2.35	0.59
1:X:455:LEU:HD22	1:X:493:GLN:NE2	2.17	0.59
1:X:474:GLN:NE2	1:X:477:SER:O	2.35	0.59
4:J:83:MET:HB3	4:J:86:LEU:HD21	1.84	0.59
1:R:449:TYR:CE2	2:H:27:GLY:HA2	2.37	0.59
1:R:474:GLN:NE2	1:R:477:SER:O	2.36	0.58
5:F:109:ARG:NH1	5:F:110:THR:O	2.35	0.58
2:H:100:THR:HA	2:H:104:THR:HA	1.85	0.58
4:E:97:ALA:HB1	4:E:108:PHE:HB3	1.87	0.57
2:H:123:PRO:HB3	2:H:149:TYR:HB3	1.87	0.57
3:B:36:TYR:CE1	3:B:89:GLN:HG2	2.40	0.57
1:Y:455:LEU:HD22	1:Y:493:GLN:NE2	2.21	0.56
4:G:83:MET:HB3	4:G:86:LEU:HD21	1.86	0.56
4:G:120:SER:HB3	4:G:154:PHE:HZ	1.70	0.56
5:F:7:SER:HB3	5:F:24:ARG:HH22	1.70	0.56
2:A:41:GLN:HB2	2:A:47:LEU:HD23	1.88	0.56
2:A:123:PRO:HB3	2:A:149:TYR:HB3	1.88	0.55
3:B:120:PRO:HD3	3:B:132:VAL:HG22	1.88	0.55
5:I:39:LYS:HB2	5:I:42:LYS:HB2	1.88	0.55
4:G:29:PHE:O	4:G:72:ARG:NH2	2.40	0.55
2:A:100:THR:HA	2:A:104:THR:HA	1.88	0.55
1:Y:406:GLU:OE1	1:Y:495:TYR:OH	2.19	0.55
5:I:107:ILE:HB	5:I:167:GLN:HE22	1.72	0.54
5:K:147:VAL:HG21	5:K:176:LEU:HD22	1.89	0.54
5:K:39:LYS:HB2	5:K:42:LYS:HB2	1.90	0.54
2:C:123:PRO:HB3	2:C:149:TYR:HB3	1.90	0.54
3:D:2:ILE:O	3:D:97:THR:HG21	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:147:VAL:HG21	5:I:176:LEU:HD22	1.90	0.54
3:L:1:ASP:HB2	3:L:95:TRP:CZ3	2.42	0.54
4:E:52:SER:O	4:E:72:ARG:NH1	2.41	0.54
5:F:39:LYS:HB2	5:F:42:LYS:HB2	1.89	0.54
1:X:401:VAL:HG22	1:X:509:ARG:HG2	1.89	0.54
3:B:2:ILE:O	3:B:97:THR:HG21	2.08	0.53
1:X:449:TYR:CE2	2:A:27:GLY:HA2	2.44	0.53
5:K:109:ARG:HH12	5:K:112:ALA:HB2	1.73	0.53
1:X:376:THR:HB	1:X:435:ALA:HB3	1.89	0.53
3:L:2:ILE:O	3:L:97:THR:HG21	2.09	0.53
3:L:39:ASN:HB2	3:L:42:LYS:HG2	1.91	0.53
4:J:100:GLY:HA3	4:J:107:TYR:CZ	2.44	0.52
3:B:39:ASN:HB2	3:B:42:LYS:HG2	1.91	0.52
2:C:41:GLN:HB2	2:C:47:LEU:HD23	1.91	0.52
3:D:36:TYR:CE1	3:D:89:GLN:HG2	2.43	0.52
5:K:199:HIS:HB3	5:K:202:LEU:HG	1.91	0.52
1:Y:431:GLY:HA2	1:Y:515:PHE:HD2	1.75	0.52
5:K:109:ARG:NH1	5:K:112:ALA:HB2	2.24	0.52
1:X:347:PHE:CE2	1:X:399:SER:HB2	2.45	0.52
4:J:152:ASP:OD1	4:J:179:GLN:NE2	2.43	0.51
4:E:91:THR:HG23	4:E:118:THR:HA	1.93	0.51
5:K:187:TYR:O	5:K:193:TYR:OH	2.28	0.51
2:C:33:ASN:ND2	2:C:54:TYR:OH	2.43	0.51
5:I:141:TYR:CG	5:I:142:PRO:HA	2.45	0.51
2:H:41:GLN:HB2	2:H:47:LEU:HD23	1.91	0.51
2:H:55:TYR:HE1	2:H:75:THR:HG21	1.76	0.51
4:G:100:GLY:HA3	4:G:107:TYR:CZ	2.46	0.51
3:D:50:THR:O	3:D:52:SER:N	2.43	0.51
2:H:40:ARG:HB3	2:H:50:ILE:HD11	1.93	0.51
4:E:152:ASP:OD1	4:E:179:GLN:NE2	2.43	0.51
5:K:7:SER:HB3	5:K:24:ARG:HH22	1.76	0.51
3:L:186:TYR:O	3:L:192:TYR:OH	2.26	0.51
5:F:187:TYR:O	5:F:193:TYR:OH	2.28	0.51
1:X:417:LYS:HD2	1:X:453:TYR:CE1	2.46	0.51
5:K:116:VAL:HA	5:K:136:LEU:O	2.11	0.50
2:C:8:GLY:HA3	2:C:20:LEU:HD23	1.93	0.50
5:I:109:ARG:HH12	5:I:112:ALA:HB2	1.77	0.50
4:E:120:SER:HB3	4:E:154:PHE:HZ	1.77	0.50
2:H:37:GLY:HA2	2:H:52:SER:HA	1.94	0.50
4:E:83:MET:HB3	4:E:86:LEU:HD21	1.93	0.50
5:I:187:TYR:O	5:I:193:TYR:OH	2.28	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:J:12:VAL:HG11	4:J:86:LEU:HD13	1.93	0.50
4:J:97:ALA:HB1	4:J:108:PHE:HB3	1.93	0.50
2:A:8:GLY:HA3	2:A:20:LEU:HD23	1.93	0.50
5:K:118:ILE:HG22	5:K:209:SER:HA	1.94	0.50
2:A:33:ASN:ND2	2:A:54:TYR:OH	2.45	0.50
2:C:32:SER:HB3	2:C:34:TYR:HD2	1.77	0.49
1:Y:431:GLY:HA2	1:Y:515:PHE:CD2	2.48	0.49
1:R:412:PRO:O	5:F:27:GLN:NE2	2.41	0.49
1:X:350:VAL:HG22	1:X:422:ASN:HB3	1.94	0.49
1:Y:350:VAL:HG22	1:Y:422:ASN:HB3	1.94	0.49
2:A:68:ARG:HH22	2:A:91:ASP:CG	2.16	0.49
3:B:90:GLN:HE21	3:B:97:THR:HG23	1.78	0.49
1:R:455:LEU:HD22	1:R:493:GLN:NE2	2.28	0.49
2:H:68:ARG:HH22	2:H:91:ASP:CG	2.16	0.49
2:C:100:THR:HA	2:C:104:THR:HA	1.94	0.49
4:G:120:SER:HB3	4:G:154:PHE:CZ	2.48	0.49
5:I:150:LYS:HG2	5:I:155:LEU:HD23	1.96	0.48
4:G:34:MET:HB3	4:G:79:LEU:HD22	1.95	0.48
4:J:29:PHE:O	4:J:72:ARG:NH2	2.46	0.48
3:D:39:ASN:ND2	3:D:42:LYS:HE3	2.28	0.48
5:F:89:GLN:NE2	5:F:90:GLN:O	2.47	0.48
2:H:32:SER:HB3	2:H:34:TYR:HD2	1.78	0.48
3:L:145:LYS:HB3	3:L:197:THR:OG1	2.13	0.48
4:E:12:VAL:HG11	4:E:86:LEU:HD13	1.96	0.48
1:X:505:TYR:CG	2:A:1:GLN:HB2	2.48	0.48
4:E:29:PHE:O	4:E:72:ARG:NH2	2.47	0.48
1:Y:372:ALA:C	1:Y:374:PHE:H	2.16	0.48
3:D:49:TYR:HD2	3:D:50:THR:HG23	1.79	0.48
1:R:372:ALA:C	1:R:374:PHE:H	2.17	0.48
1:R:502:GLY:O	1:R:506:GLN:HG3	2.14	0.48
5:I:89:GLN:HB2	5:I:99:PHE:CD2	2.48	0.48
1:X:372:ALA:C	1:X:374:PHE:H	2.17	0.48
4:G:52:SER:HB3	4:G:57:ASN:HB2	1.96	0.47
3:B:148:TRP:CE2	3:B:179:LEU:HB2	2.49	0.47
4:E:7:SER:OG	4:E:21:SER:OG	2.27	0.47
2:H:55:TYR:CE1	2:H:75:THR:HG21	2.48	0.47
5:I:116:VAL:HA	5:I:136:LEU:O	2.15	0.47
3:B:105:ASP:OD1	3:B:106:ILE:N	2.47	0.47
4:E:120:SER:HB3	4:E:154:PHE:CZ	2.49	0.47
3:B:49:TYR:HD2	3:B:50:THR:HG23	1.80	0.47
3:B:193:ALA:HB2	3:B:208:SER:HB3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:143:GLY:HA2	2:C:158:TRP:CH2	2.50	0.47
5:I:92:TYR:OH	1:Y:429:PHE:N	2.48	0.47
1:X:431:GLY:HA2	1:X:515:PHE:CD2	2.48	0.47
2:A:32:SER:HB3	2:A:34:TYR:HD2	1.79	0.47
5:F:109:ARG:NH1	5:F:112:ALA:HB2	2.30	0.47
1:X:449:TYR:HB3	1:X:494:SER:HB3	1.96	0.47
3:B:20:THR:HG23	3:B:72:THR:HG23	1.97	0.47
1:X:340:GLU:OE1	1:X:356:LYS:NZ	2.48	0.46
3:L:190:LYS:HD3	1:Y:357:ARG:NH1	2.31	0.46
1:Y:339:GLY:O	1:Y:343:ASN:HB2	2.16	0.46
3:L:105:ASP:OD1	3:L:106:ILE:N	2.49	0.46
5:K:35:TRP:CE2	5:K:73:LEU:HB2	2.50	0.46
3:B:39:ASN:ND2	3:B:42:LYS:HE3	2.30	0.46
2:C:55:TYR:HE1	2:C:75:THR:HG21	1.79	0.46
4:J:67:ARG:NH1	4:J:90:ASP:OD2	2.34	0.46
2:H:29:ILE:HA	2:H:36:TRP:CZ2	2.51	0.46
3:D:39:ASN:HB2	3:D:42:LYS:HG2	1.98	0.46
1:R:376:THR:HB	1:R:435:ALA:HB3	1.97	0.46
5:I:114:PRO:HB3	5:I:140:PHE:HB3	1.97	0.46
1:X:431:GLY:HA2	1:X:515:PHE:HD2	1.80	0.46
3:D:34:ALA:HA	3:D:49:TYR:HA	1.98	0.46
3:D:37:GLN:HB2	3:D:47:LEU:HD11	1.97	0.46
2:H:3:GLN:H	2:H:26:GLY:HA3	1.81	0.46
4:E:98:LYS:NZ	4:E:109:ASP:OD2	2.47	0.46
4:G:97:ALA:HB1	4:G:108:PHE:HB3	1.98	0.46
2:A:55:TYR:HE1	2:A:75:THR:HG21	1.80	0.46
5:K:150:LYS:HG2	5:K:155:LEU:HD23	1.98	0.46
3:L:39:ASN:ND2	3:L:42:LYS:HE3	2.31	0.45
5:K:39:LYS:HD3	5:K:84:ALA:HB2	1.97	0.45
2:C:55:TYR:CE1	2:C:75:THR:HG21	2.51	0.45
4:J:34:MET:HB3	4:J:79:LEU:HD22	1.98	0.45
2:A:40:ARG:HB3	2:A:50:ILE:HD11	1.98	0.45
3:B:51:ALA:O	3:B:64:GLY:HA3	2.16	0.45
2:C:105:PHE:CD1	3:D:46:LEU:HD22	2.52	0.45
3:D:83:PHE:CE1	3:D:106:ILE:HG13	2.51	0.45
5:I:109:ARG:NH1	5:I:112:ALA:HB2	2.32	0.45
1:R:401:VAL:HG22	1:R:509:ARG:HG2	1.99	0.45
5:F:35:TRP:CE2	5:F:73:LEU:HB2	2.51	0.45
5:F:150:LYS:HG2	5:F:155:LEU:HD23	1.98	0.45
4:J:208:HIS:CD2	4:J:210:PRO:HD2	2.52	0.45
5:F:195:CYS:O	5:F:207:THR:HA	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:2:VAL:HB	2:A:106:TYR:CG	2.51	0.45
5:F:131:ALA:HB3	5:F:182:LEU:HD12	1.99	0.44
5:I:7:SER:HB3	5:I:24:ARG:HH22	1.81	0.44
3:B:1:ASP:HB2	3:B:95:TRP:HZ3	1.82	0.44
1:R:350:VAL:HG22	1:R:422:ASN:HB3	1.99	0.44
5:I:188:GLU:HG3	5:I:212:ARG:CZ	2.48	0.44
3:B:35:TRP:CE2	3:B:73:LEU:HB2	2.53	0.44
1:Y:376:THR:HB	1:Y:435:ALA:HB3	2.00	0.44
2:C:54:TYR:HD1	2:C:54:TYR:HA	1.66	0.44
2:H:54:TYR:HD1	2:H:54:TYR:HA	1.67	0.44
1:X:340:GLU:O	1:X:344:ALA:HB2	2.17	0.44
3:B:50:THR:O	3:B:52:SER:N	2.45	0.44
1:R:487:ASN:ND2	3:L:92:TYR:O	2.51	0.44
3:L:31:ASN:O	3:L:50:THR:HA	2.17	0.44
4:J:91:THR:HG23	4:J:118:THR:HA	1.98	0.44
4:E:208:HIS:CD2	4:E:210:PRO:HD2	2.52	0.44
3:B:140:TYR:CG	3:B:141:PRO:HA	2.53	0.44
4:G:12:VAL:HG11	4:G:86:LEU:HD13	1.99	0.44
2:C:103:ALA:HB3	2:C:105:PHE:CE1	2.53	0.44
5:F:159:ASN:O	5:F:180:LEU:HD12	2.18	0.43
2:A:55:TYR:CE1	2:A:75:THR:HG21	2.53	0.43
2:C:3:GLN:H	2:C:26:GLY:HA3	1.83	0.43
1:X:411:ALA:HB3	1:X:414:GLN:HG3	1.99	0.43
3:D:33:LEU:HD13	3:D:71:PHE:CD1	2.53	0.43
1:X:502:GLY:O	1:X:506:GLN:HG3	2.18	0.43
3:B:115:VAL:HA	3:B:135:LEU:O	2.18	0.43
1:Y:401:VAL:HG22	1:Y:509:ARG:HG2	2.00	0.43
1:R:359:SER:OG	1:R:394:ASN:OD1	2.29	0.43
1:R:406:GLU:OE1	1:R:495:TYR:OH	2.23	0.43
5:I:107:ILE:O	5:I:141:TYR:CZ	2.71	0.43
1:Y:486:PHE:HD1	1:Y:486:PHE:HA	1.67	0.43
3:L:18:LYS:HG2	3:L:76:SER:O	2.18	0.43
1:R:449:TYR:HB3	1:R:494:SER:HB3	1.99	0.43
2:H:187:THR:HG21	3:L:137:ASN:ND2	2.34	0.43
4:J:6:GLU:H	4:J:113:GLN:NE2	2.15	0.43
3:L:37:GLN:HB2	3:L:47:LEU:HD11	2.00	0.43
5:I:39:LYS:HD3	5:I:84:ALA:HB2	2.01	0.43
5:K:199:HIS:H	5:K:202:LEU:HD12	1.83	0.43
1:Y:501:ASN:HB3	1:Y:505:TYR:HB2	2.01	0.43
3:D:39:ASN:OD1	3:D:84:ALA:HB2	2.19	0.43
1:X:403:ARG:HH21	3:B:56:SER:HB2	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:147:LYS:HE2	3:B:129:THR:HG21	2.01	0.43
3:D:20:THR:HG23	3:D:72:THR:HG23	2.00	0.43
1:Y:474:GLN:NE2	1:Y:477:SER:O	2.52	0.43
4:G:205:ASN:ND2	4:G:216:ASP:OD1	2.52	0.42
5:I:83:PHE:CZ	5:I:107:ILE:HG12	2.54	0.42
1:Y:371:SER:C	1:Y:373:SER:H	2.21	0.42
2:C:18:LEU:HB2	2:C:87:VAL:HG11	2.01	0.42
3:D:140:TYR:CG	3:D:141:PRO:HA	2.54	0.42
3:B:124:GLN:HG2	3:B:129:THR:O	2.19	0.42
1:R:371:SER:C	1:R:373:SER:H	2.23	0.42
2:H:92:THR:HG23	2:H:114:THR:HA	2.01	0.42
3:L:147:GLN:NE2	3:L:154:LEU:HB3	2.34	0.42
3:D:50:THR:C	3:D:52:SER:H	2.22	0.42
5:I:92:TYR:O	1:Y:380:TYR:HA	2.19	0.42
1:R:417:LYS:HD2	1:R:453:TYR:CE1	2.54	0.42
4:G:7:SER:OG	4:G:21:SER:OG	2.35	0.42
2:A:14:PRO:HD2	2:A:117:SER:HB3	2.02	0.42
2:H:2:VAL:HB	2:H:106:TYR:CG	2.55	0.42
5:F:147:VAL:HG21	5:F:176:LEU:HD22	2.02	0.42
2:A:29:ILE:HA	2:A:36:TRP:CZ2	2.55	0.42
2:C:29:ILE:HA	2:C:36:TRP:CZ2	2.54	0.42
4:G:104:TRP:HH2	1:Y:517:LEU:HD22	1.84	0.42
3:B:33:LEU:HD13	3:B:71:PHE:CD1	2.55	0.42
1:Y:505:TYR:CG	2:C:1:GLN:HB2	2.55	0.42
3:D:18:LYS:HG2	3:D:76:SER:O	2.20	0.42
3:B:4:LEU:HD13	3:B:88:CYS:SG	2.59	0.42
1:Y:444:LYS:HG3	1:Y:448:ASN:HB2	2.02	0.42
4:E:154:PHE:HA	4:E:155:PRO:HA	1.89	0.42
4:J:192:VAL:HG11	4:J:202:TYR:CE1	2.54	0.42
3:B:140:TYR:CD1	3:B:141:PRO:HA	2.55	0.42
1:Y:455:LEU:HD22	1:Y:493:GLN:HE21	1.85	0.42
1:R:389:ASP:N	1:R:389:ASP:OD1	2.53	0.42
2:C:68:ARG:HH22	2:C:91:ASP:CG	2.23	0.42
5:K:27:GLN:NE2	1:X:412:PRO:O	2.50	0.41
3:B:145:LYS:HB3	3:B:197:THR:OG1	2.20	0.41
4:G:192:VAL:HG11	4:G:202:TYR:CE1	2.55	0.41
1:R:455:LEU:HD22	1:R:493:GLN:HE21	1.86	0.41
1:X:455:LEU:HD22	1:X:493:GLN:HE21	1.84	0.41
5:F:42:LYS:HB3	5:F:42:LYS:HE2	1.81	0.41
3:D:120:PRO:HD3	3:D:132:VAL:HG22	2.01	0.41
4:J:120:SER:HB3	4:J:154:PHE:HZ	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:197:THR:HG22	3:B:204:PRO:HB3	2.02	0.41
2:C:100:THR:HG22	2:C:104:THR:HG22	2.03	0.41
3:D:140:TYR:CD1	3:D:141:PRO:HA	2.56	0.41
1:R:431:GLY:HA2	1:R:515:PHE:HD2	1.85	0.41
2:H:100:THR:HG22	2:H:104:THR:HG22	2.03	0.41
5:F:114:PRO:HB3	5:F:140:PHE:HB3	2.03	0.41
5:I:35:TRP:CE2	5:I:73:LEU:HB2	2.56	0.41
5:K:159:ASN:O	5:K:180:LEU:HD12	2.21	0.41
2:A:88:THR:HG23	2:A:90:ALA:HB3	2.02	0.41
3:B:83:PHE:CE1	3:B:106:ILE:HG13	2.56	0.41
1:Y:476:GLY:HA3	1:Y:487:ASN:ND2	2.36	0.41
4:J:205:ASN:ND2	4:J:216:ASP:OD1	2.54	0.41
2:A:28:SER:HB3	2:A:31:SER:HB2	2.01	0.41
2:C:187:THR:HG21	3:D:137:ASN:ND2	2.36	0.41
3:D:145:LYS:HB3	3:D:197:THR:OG1	2.20	0.41
4:E:160:VAL:HA	4:E:205:ASN:O	2.20	0.41
2:C:107:TRP:CE3	3:D:44:PRO:HD2	2.56	0.41
3:D:31:ASN:O	3:D:50:THR:HA	2.21	0.41
3:L:1:ASP:HB2	3:L:95:TRP:HZ3	1.85	0.40
3:L:1:ASP:HB2	3:L:95:TRP:CE3	2.56	0.40
4:G:208:HIS:CD2	4:G:210:PRO:HD2	2.57	0.40
1:X:371:SER:C	1:X:373:SER:H	2.25	0.40
3:B:37:GLN:HB2	3:B:47:LEU:HD11	2.02	0.40
3:D:186:TYR:O	3:D:192:TYR:OH	2.31	0.40
1:R:476:GLY:HA3	1:R:487:ASN:ND2	2.36	0.40
3:L:35:TRP:CE2	3:L:73:LEU:HB2	2.56	0.40
3:L:89:GLN:O	3:L:89:GLN:HG3	2.20	0.40
4:G:154:PHE:HA	4:G:155:PRO:HA	1.87	0.40
3:B:186:TYR:O	3:B:192:TYR:OH	2.35	0.40
2:C:88:THR:HG23	2:C:90:ALA:HB3	2.03	0.40
3:L:16:GLY:N	3:L:78:LEU:O	2.45	0.40
4:G:27:PHE:CE2	4:G:29:PHE:HA	2.57	0.40
1:X:339:GLY:O	1:X:343:ASN:HB2	2.22	0.40
2:A:103:ALA:HB1	3:B:36:TYR:OH	2.21	0.40
1:Y:417:LYS:HD2	1:Y:453:TYR:CE1	2.56	0.40
1:R:403:ARG:HH21	3:L:56:SER:HB2	1.86	0.40
2:H:42:PRO:HB2	2:H:45:LYS:HB2	2.02	0.40
4:E:34:MET:HB3	4:E:79:LEU:HD22	2.04	0.40
1:X:501:ASN:HB3	1:X:505:TYR:HB2	2.03	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:389:ASP:OD1	4:G:76:LYS:NZ[3_545]	2.08	0.12
1:R:526:GLY:O	4:G:19:ARG:NH1[3_545]	2.18	0.02

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	R	192/202 (95%)	179 (93%)	13 (7%)	0	100	100
1	X	192/202 (95%)	179 (93%)	13 (7%)	0	100	100
1	Y	192/202 (95%)	179 (93%)	13 (7%)	0	100	100
2	A	212/222 (96%)	200 (94%)	9 (4%)	3 (1%)	11	47
2	C	212/222 (96%)	199 (94%)	10 (5%)	3 (1%)	11	47
2	H	212/222 (96%)	200 (94%)	9 (4%)	3 (1%)	11	47
3	B	211/214 (99%)	204 (97%)	7 (3%)	0	100	100
3	D	211/214 (99%)	203 (96%)	8 (4%)	0	100	100
3	L	211/214 (99%)	202 (96%)	9 (4%)	0	100	100
4	E	210/226 (93%)	200 (95%)	10 (5%)	0	100	100
4	G	210/226 (93%)	200 (95%)	10 (5%)	0	100	100
4	J	210/226 (93%)	200 (95%)	10 (5%)	0	100	100
5	F	210/215 (98%)	202 (96%)	8 (4%)	0	100	100
5	I	210/215 (98%)	199 (95%)	11 (5%)	0	100	100
5	K	210/215 (98%)	201 (96%)	9 (4%)	0	100	100
All	All	3105/3237 (96%)	2947 (95%)	149 (5%)	9 (0%)	41	75

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	101	LEU
2	A	101	LEU

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Mol	Chain	Res	Type
2	C	101	LEU
2	H	56	SER
2	C	56	SER
2	A	56	SER
2	A	57	GLY
2	H	57	GLY
2	C	57	GLY

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	R	166/175 (95%)	165 (99%)	1 (1%)	86	94
1	X	166/175 (95%)	165 (99%)	1 (1%)	86	94
1	Y	166/175 (95%)	165 (99%)	1 (1%)	86	94
2	A	185/191 (97%)	184 (100%)	1 (0%)	88	95
2	C	185/191 (97%)	184 (100%)	1 (0%)	88	95
2	H	185/191 (97%)	184 (100%)	1 (0%)	88	95
3	B	187/188 (100%)	185 (99%)	2 (1%)	73	87
3	D	187/188 (100%)	186 (100%)	1 (0%)	88	95
3	L	187/188 (100%)	186 (100%)	1 (0%)	88	95
4	E	180/191 (94%)	179 (99%)	1 (1%)	86	94
4	G	180/191 (94%)	179 (99%)	1 (1%)	86	94
4	J	180/191 (94%)	179 (99%)	1 (1%)	86	94
5	F	186/188 (99%)	184 (99%)	2 (1%)	73	87
5	I	186/188 (99%)	184 (99%)	2 (1%)	73	87
5	K	186/188 (99%)	184 (99%)	2 (1%)	73	87
All	All	2712/2799 (97%)	2693 (99%)	19 (1%)	84	93

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	R	486	PHE
2	H	54	TYR
3	L	89	GLN
4	E	108	PHE
5	F	161	GLN
5	F	182	LEU
4	G	108	PHE
5	I	161	GLN
5	I	182	LEU
4	J	108	PHE
5	K	161	GLN
5	K	182	LEU
1	X	486	PHE
2	A	54	TYR
3	B	89	GLN
3	B	152	ASN
1	Y	486	PHE
2	C	54	TYR
3	D	89	GLN

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

Mol	Chain	Res	Type
5	I	167	GLN
2	A	33	ASN
2	C	33	ASN

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](#)

1 ligand is 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
6	NAG	R	601	1	14,14,15	0.50	0	17,19,21	0.73	1 (5%)

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
6	NAG	R	601	1	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	R	601	NAG	C1-O5-C5	2.66	115.80	112.19

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 [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, 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	R	194/202 (96%)	0.37	2 (1%) 82 71	74, 118, 181, 234	0
1	X	194/202 (96%)	0.46	9 (4%) 32 24	101, 146, 224, 263	0
1	Y	194/202 (96%)	0.36	4 (2%) 63 50	83, 124, 188, 250	0
2	A	216/222 (97%)	0.34	5 (2%) 60 46	90, 133, 193, 234	0
2	C	216/222 (97%)	0.66	26 (12%) 4 4	100, 160, 214, 246	0
2	H	216/222 (97%)	0.29	6 (2%) 53 40	82, 133, 188, 231	0
3	B	213/214 (99%)	0.20	0 100 100	94, 125, 161, 190	0
3	D	213/214 (99%)	0.40	17 (7%) 12 10	93, 148, 183, 272	0
3	L	213/214 (99%)	0.30	0 100 100	84, 124, 158, 198	0
4	E	214/226 (94%)	0.51	21 (9%) 7 6	87, 155, 287, 312	0
4	G	214/226 (94%)	0.91	28 (13%) 3 4	110, 177, 294, 335	0
4	J	214/226 (94%)	1.36	60 (28%) 0 0	132, 214, 329, 374	0
5	F	212/215 (98%)	1.02	47 (22%) 0 0	102, 190, 282, 313	0
5	I	212/215 (98%)	1.29	54 (25%) 0 0	117, 210, 300, 356	0
5	K	212/215 (98%)	2.27	91 (42%) 0 0	159, 275, 357, 389	0
All	All	3147/3237 (97%)	0.72	370 (11%) 4 4	74, 149, 288, 389	0

All (370) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	J	173	THR	9.5
5	K	50	ALA	9.3
4	G	149	LEU	9.1
4	G	133	ALA	8.8
5	F	62	PHE	8.7
5	K	118	ILE	8.7
5	I	147	VAL	8.6

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Mol	Chain	Res	Type	RSRZ
5	K	84	ALA	8.5
4	J	188	SER	8.5
5	K	195	CYS	8.0
4	J	158	VAL	8.0
5	K	156	GLN	7.9
4	G	128	SER	7.8
4	G	134	PRO	7.4
5	K	149	TRP	7.2
5	K	62	PHE	7.2
5	K	134	VAL	7.1
5	K	113	ALA	7.1
5	K	105	VAL	6.8
5	K	51	ALA	6.7
5	K	206	VAL	6.7
4	G	127	PRO	6.7
4	J	189	VAL	6.6
4	J	134	PRO	6.5
4	J	160	VAL	6.5
3	D	193	ALA	6.5
5	K	132	SER	6.2
5	K	13	ALA	6.1
4	J	206	VAL	6.1
5	K	133	VAL	6.0
5	K	143	ARG	6.0
5	K	31	SER	6.0
5	K	30	SER	5.9
5	K	148	GLN	5.8
5	K	196	GLU	5.8
4	G	146	LEU	5.8
5	K	207	THR	5.8
4	J	193	PRO	5.7
4	J	207	ASN	5.5
5	I	62	PHE	5.5
5	K	124	GLU	5.4
5	I	153	ASN	5.4
5	F	11	LEU	5.4
4	G	150	VAL	5.3
4	J	194	SER	5.2
5	K	35	TRP	5.1
5	K	47	LEU	5.1
5	K	119	PHE	5.1
5	I	11	LEU	5.0

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Mol	Chain	Res	Type	RSRZ
4	J	165	GLY	5.0
4	G	210	PRO	5.0
5	K	201	GLY	5.0
5	I	132	SER	5.0
5	K	11	LEU	5.0
5	K	155	LEU	4.8
5	K	54	LEU	4.8
5	K	123	ASP	4.8
5	I	186	ASP	4.7
5	K	166	GLU	4.7
4	J	195	SER	4.6
4	G	129	VAL	4.6
5	F	134	VAL	4.6
4	J	1	GLU	4.6
5	I	202	LEU	4.6
5	K	87	TYR	4.6
5	K	52	SER	4.5
4	J	2	VAL	4.5
5	F	106	GLU	4.5
4	J	192	VAL	4.5
5	K	55	GLN	4.5
4	J	150	VAL	4.5
5	I	150	LYS	4.4
4	J	190	VAL	4.4
5	I	154	ALA	4.4
5	K	150	LYS	4.4
2	C	125	VAL	4.4
5	K	29	ILE	4.3
5	I	149	TRP	4.3
5	K	176	LEU	4.3
4	G	31	SER	4.3
5	K	49	TYR	4.2
5	K	19	VAL	4.2
5	K	46	LEU	4.2
4	E	202	TYR	4.2
4	G	132	LEU	4.2
4	E	129	VAL	4.2
5	K	92	TYR	4.2
4	J	214	LYS	4.2
4	J	174	PHE	4.1
4	J	162	TRP	4.1
4	E	188	SER	4.1

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Mol	Chain	Res	Type	RSRZ
4	J	213	THR	4.0
5	I	55	GLN	4.0
4	J	106	TYR	3.9
5	F	19	VAL	3.9
3	D	196	VAL	3.9
4	J	127	PRO	3.9
5	F	195	CYS	3.9
5	F	78	LEU	3.9
5	K	73	LEU	3.9
5	K	164	VAL	3.9
5	K	38	GLN	3.8
5	K	117	PHE	3.8
5	I	78	LEU	3.8
4	J	154	PHE	3.8
5	F	84	ALA	3.8
5	K	205	PRO	3.8
4	J	129	VAL	3.8
5	F	13	ALA	3.7
5	K	60	SER	3.7
5	K	165	THR	3.7
1	R	527	LYS	3.7
4	G	193	PRO	3.7
4	G	112	GLY	3.7
5	K	175	SER	3.7
5	K	33	LEU	3.6
5	K	86	TYR	3.6
4	J	74	ASN	3.6
5	K	48	ILE	3.5
5	F	176	LEU	3.5
2	C	144	CYS	3.5
4	J	148	CYS	3.5
4	J	133	ALA	3.5
5	I	112	ALA	3.5
4	G	4	LEU	3.5
5	I	54	LEU	3.5
5	K	116	VAL	3.5
4	E	149	LEU	3.5
5	F	15	VAL	3.5
5	F	107	ILE	3.5
3	D	130	ALA	3.5
4	J	146	LEU	3.4
2	C	218	LYS	3.4

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Mol	Chain	Res	Type	RSRZ
5	F	103	THR	3.4
5	I	195	CYS	3.4
4	J	111	TRP	3.4
5	F	147	VAL	3.4
5	I	114	PRO	3.4
4	J	218	ARG	3.4
5	I	15	VAL	3.4
5	K	145	ALA	3.4
5	K	66	GLY	3.4
5	K	197	VAL	3.4
2	C	1	GLN	3.3
5	F	194	ALA	3.3
4	J	168	THR	3.3
5	I	103	THR	3.3
2	C	184	SER	3.3
5	K	171	ASP	3.3
5	K	63	SER	3.3
5	I	196	GLU	3.3
5	K	107	ILE	3.3
5	F	86	TYR	3.3
5	I	46	LEU	3.3
5	I	200	GLN	3.3
5	F	143	ARG	3.3
4	J	45	LEU	3.3
2	C	145	LEU	3.3
5	F	178	SER	3.3
4	G	144	ALA	3.2
4	J	95	TYR	3.2
5	I	115	SER	3.2
5	K	21	ILE	3.2
4	J	35	HIS	3.2
5	K	37	GLN	3.2
4	J	166	ALA	3.2
4	J	172	HIS	3.2
5	F	162	GLU	3.2
5	I	35	TRP	3.1
4	J	125	LYS	3.1
5	I	12	SER	3.1
1	X	380	TYR	3.1
4	G	3	GLN	3.1
5	F	133	VAL	3.1
5	I	207	THR	3.1

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Mol	Chain	Res	Type	RSRZ
4	J	110	TYR	3.1
5	F	124	GLU	3.1
5	I	161	GLN	3.1
3	D	132	VAL	3.1
5	K	204	SER	3.1
4	J	29	PHE	3.1
4	J	153	TYR	3.1
5	K	83	PHE	3.1
5	I	86	TYR	3.0
5	K	120	PRO	3.0
2	C	142	LEU	3.0
5	K	139	ASN	3.0
5	K	106	GLU	3.0
5	I	143	ARG	3.0
4	G	194	SER	3.0
5	I	162	GLU	3.0
5	I	210	PHE	3.0
2	C	73	VAL	3.0
5	K	75	ILE	3.0
4	E	160	VAL	2.9
5	K	64	GLY	2.9
4	J	208	HIS	2.9
4	G	25	SER	2.9
5	I	176	LEU	2.9
5	F	208	LYS	2.9
3	D	131	SER	2.9
5	F	10	SER	2.9
5	I	194	ALA	2.9
5	K	15	VAL	2.9
5	F	118	ILE	2.9
5	I	160	SER	2.9
5	I	80	PRO	2.9
4	J	191	THR	2.9
5	F	83	PHE	2.9
3	D	148	TRP	2.9
4	G	167	LEU	2.8
5	K	36	TYR	2.8
2	A	39	ILE	2.8
5	I	206	VAL	2.8
5	F	37	GLN	2.8
5	F	149	TRP	2.8
4	J	25	SER	2.8

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Mol	Chain	Res	Type	RSRZ
5	I	105	VAL	2.8
4	J	149	LEU	2.8
5	I	106	GLU	2.8
2	A	1	GLN	2.8
4	J	159	THR	2.7
3	D	135	LEU	2.7
5	I	123	ASP	2.7
5	K	97	LEU	2.7
5	K	45	LYS	2.7
5	K	157	SER	2.7
5	I	13	ALA	2.7
4	J	167	LEU	2.7
4	E	127	PRO	2.7
4	J	94	TYR	2.7
4	E	210	PRO	2.7
5	I	48	ILE	2.7
4	J	115	THR	2.7
5	I	148	GLN	2.7
4	G	24	ALA	2.7
4	G	158	VAL	2.7
1	X	369	TYR	2.6
5	F	150	LYS	2.6
5	K	180	LEU	2.6
3	D	123	GLU	2.6
5	F	136	LEU	2.6
2	C	71	ILE	2.6
4	E	196	SER	2.6
2	C	96	TYR	2.6
5	K	109	ARG	2.6
4	E	150	VAL	2.6
5	F	197	VAL	2.6
4	E	148	CYS	2.6
1	X	456	PHE	2.6
2	C	80	PHE	2.6
2	H	199	ILE	2.5
5	F	46	LEU	2.5
4	J	196	SER	2.5
2	C	82	LEU	2.5
5	I	198	THR	2.5
5	F	12	SER	2.5
5	K	112	ALA	2.5
4	G	145	ALA	2.5

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Mol	Chain	Res	Type	RSRZ
1	Y	369	TYR	2.5
2	C	215	VAL	2.5
2	H	125	VAL	2.5
5	F	21	ILE	2.5
5	K	153	ASN	2.5
4	J	187	SER	2.4
5	I	146	LYS	2.4
5	F	155	LEU	2.4
5	F	210	PHE	2.4
5	K	78	LEU	2.4
4	E	1	GLU	2.4
4	E	219	VAL	2.4
5	I	201	GLY	2.4
4	G	143	THR	2.4
5	F	174	TYR	2.4
4	E	218	ARG	2.4
1	X	510	VAL	2.4
2	C	146	VAL	2.4
2	C	107	TRP	2.4
4	J	171	VAL	2.4
5	I	73	LEU	2.4
5	F	80	PRO	2.4
5	I	197	VAL	2.4
4	E	167	LEU	2.4
4	E	144	ALA	2.4
2	C	185	VAL	2.4
1	Y	464	PHE	2.4
5	F	116	VAL	2.3
5	I	156	GLN	2.3
5	K	12	SER	2.3
5	F	105	VAL	2.3
5	K	200	GLN	2.3
4	E	130	PHE	2.3
1	X	402	ILE	2.3
4	E	131	PRO	2.3
3	D	129	THR	2.3
5	I	203	SER	2.3
5	K	167	GLN	2.3
5	I	21	ILE	2.3
5	K	199	HIS	2.3
2	C	99	SER	2.3
4	E	220	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
5	K	208	LYS	2.3
1	X	515	PHE	2.3
5	F	137	LEU	2.3
2	A	166	GLY	2.2
1	X	429	PHE	2.2
4	J	126	GLY	2.2
5	K	147	VAL	2.2
2	H	145	LEU	2.2
2	H	59	SER	2.2
2	C	36	TRP	2.2
2	H	180	TYR	2.2
3	D	134	CYS	2.2
4	J	107	TYR	2.2
1	X	382	VAL	2.2
4	J	39	GLN	2.2
4	E	162	TRP	2.2
5	I	33	LEU	2.2
1	X	334	ASN	2.2
2	C	199	ILE	2.2
3	D	62	PHE	2.2
3	D	47	LEU	2.2
5	F	82	ASP	2.2
5	K	14	SER	2.2
2	H	156	VAL	2.2
4	G	86	LEU	2.2
5	F	6	GLN	2.2
1	Y	456	PHE	2.2
5	F	75	ILE	2.2
4	J	211	SER	2.2
5	K	198	THR	2.2
3	D	194	CYS	2.1
4	G	195	SER	2.1
5	I	151	VAL	2.1
4	G	196	SER	2.1
4	E	146	LEU	2.1
2	C	147	LYS	2.1
2	A	175	GLN	2.1
3	D	205	VAL	2.1
3	D	118	PHE	2.1
4	J	202	TYR	2.1
5	K	94	THR	2.1
5	K	23	CYS	2.1

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Mol	Chain	Res	Type	RSRZ
5	K	32	TYR	2.1
4	J	108	PHE	2.1
5	K	99	PHE	2.1
4	J	164	SER	2.1
5	F	87	TYR	2.1
5	F	85	THR	2.1
2	C	148	ASP	2.1
5	F	35	TRP	2.1
5	K	182	LEU	2.1
2	A	149	TYR	2.1
2	C	39	ILE	2.1
3	D	201	LEU	2.1
5	F	207	THR	2.1
4	G	20	LEU	2.1
2	C	217	PRO	2.0
4	E	189	VAL	2.0
1	R	369	TYR	2.0
4	J	38	ARG	2.0
2	C	24	VAL	2.0
2	C	52	SER	2.0
2	C	61	TYR	2.0
5	I	133	VAL	2.0
5	I	119	PHE	2.0
1	Y	449	TYR	2.0
3	D	133	VAL	2.0
4	G	160	VAL	2.0
5	I	155	LEU	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
6	NAG	R	601	14/15	0.33	0.58	152,211,232,233	0

6.5 Other polymers [i](#)

There are no such residues in this entry.