



Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 08:54 PM GMT

PDB ID : 3V6F
Title : Crystal Structure of an anti-HBV e-antigen monoclonal Fab fragment (e6), unbound
Authors : Dimattia, M.A.; Watts, N.R.; Stahl, S.J.; Grimes, J.M.; Steven, A.C.; Stuart, D.I.; Wingfield, P.T.
Deposited on : 2011-12-19
Resolution : 2.52 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

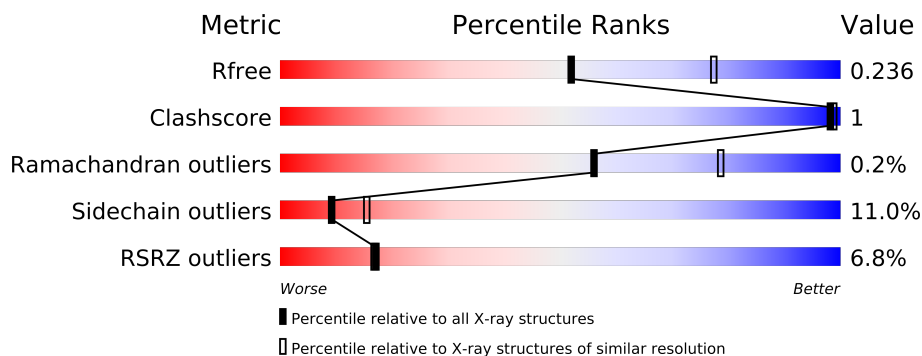
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

The reported resolution of this entry is 2.52 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}	66092	3240 (2.54-2.50)
Clashscore	79885	4080 (2.54-2.50)
Ramachandran outliers	78287	3990 (2.54-2.50)
Sidechain outliers	78261	3992 (2.54-2.50)
RSRZ outliers	66119	3241 (2.54-2.50)

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. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	224	
1	C	224	
1	E	224	
1	H	224	
2	B	219	
2	D	219	
2	F	219	
2	L	219	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 13731 atoms, of which 0 are hydrogen and 0 are deuterium.

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 Fab e6 Heavy Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	218	Total	C	N	O	S	0	0	0
			1630	1027	262	332	9			
1	C	212	Total	C	N	O	S	0	0	0
			1596	1008	256	323	9			
1	E	212	Total	C	N	O	S	0	0	0
			1596	1008	256	323	9			
1	H	215	Total	C	N	O	S	0	0	0
			1612	1016	259	328	9			

- Molecule 2 is a protein called Fab e6 Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	219	Total	C	N	O	S	0	0	0
			1707	1066	284	348	9			
2	D	219	Total	C	N	O	S	0	0	0
			1707	1066	284	348	9			
2	F	219	Total	C	N	O	S	0	0	0
			1707	1066	284	348	9			
2	L	219	Total	C	N	O	S	0	0	0
			1707	1066	284	348	9			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	40	Total	O	0	0
			40	40		
3	B	51	Total	O	0	0
			51	51		
3	C	48	Total	O	0	0
			48	48		
3	D	44	Total	O	0	0
			44	44		

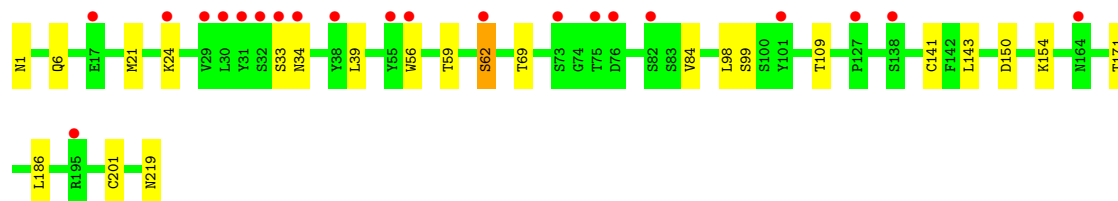
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	E	60	Total 60	O 60	0	0
3	F	51	Total 51	O 51	0	0
3	H	88	Total 88	O 88	0	0
3	L	87	Total 87	O 87	0	0

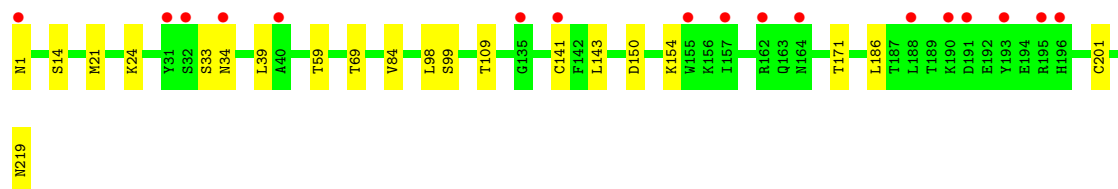
- Molecule 2: Fab e6 Light Chain

Chain B: 



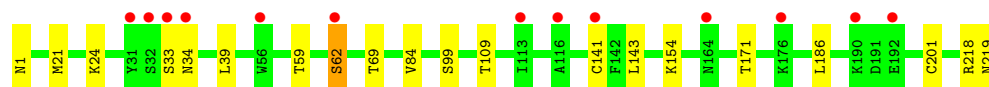
- Molecule 2: Fab e6 Light Chain

Chain D: 



- Molecule 2: Fab e6 Light Chain

Chain F: 



- Molecule 2: Fab e6 Light Chain

Chain L: 



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	124.12Å 68.24Å 236.64Å 90.00° 96.27° 90.00°	Depositor
Resolution (Å)	31.06 – 2.52 31.06 – 2.52	Depositor EDS
% Data completeness (in resolution range)	99.3 (31.06-2.52) 99.5 (31.06-2.52)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.42 (at 2.51Å)	Xtriage
Refinement program	BUSTER 2.11.2	Depositor
R, R_{free}	0.179 , 0.220 0.196 , 0.236	Depositor DCC
R_{free} test set	3376 reflections (5.35%)	DCC
Wilson B-factor (Å ²)	47.5	Xtriage
Anisotropy	0.423	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 47.5	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	0 of 66469 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	13731	wwPDB-VP
Average B, all atoms (Å ²)	62.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.10% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

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	0.51	0/1672	0.78	0/2281
1	C	0.50	0/1637	0.75	0/2233
1	E	0.54	0/1637	0.78	1/2233 (0.0%)
1	H	0.57	0/1653	0.79	1/2254 (0.0%)
2	B	0.49	0/1746	0.76	0/2369
2	D	0.48	0/1746	0.75	0/2369
2	F	0.49	0/1746	0.75	0/2369
2	L	0.53	0/1746	0.78	0/2369
All	All	0.51	0/13583	0.77	2/18477 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	50	THR	N-CA-CB	5.27	120.32	110.30
1	E	50	THR	N-CA-CB	5.11	120.01	110.30

There are no chirality outliers.

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1630	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1596	0	0	0	0
1	E	1596	0	0	3	0
1	H	1612	0	0	0	0
2	B	1707	0	0	2	0
2	D	1707	0	0	0	0
2	F	1707	0	0	0	0
2	L	1707	0	0	2	0
3	A	40	0	0	0	0
3	B	51	0	0	1	0
3	C	48	0	0	0	0
3	D	44	0	0	0	0
3	E	60	0	0	0	0
3	F	51	0	0	0	0
3	H	88	0	0	0	0
3	L	87	0	0	0	0
All	All	13731	0	0	8	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 1.

All (8) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:E:47:TRP:NE1	1:E:50:THR:CG2	2.64	0.60
2:L:19:VAL:CG2	2:L:84:VAL:CG2	2.88	0.51
1:E:40:THR:OG1	1:E:42:ASP:OD1	2.31	0.49
2:L:113:ILE:O	2:L:173:GLN:NE2	2.47	0.47
1:A:204:HIS:ND1	1:A:207:SER:OG	2.49	0.46
1:A:103:SER:O	2:B:56:TRP:NE1	2.50	0.45
1:E:102:SER:O	1:E:103:SER:CB	2.65	0.44
2:B:6:GLN:N	3:B:304:HOH:O	2.54	0.41

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	A	214/224 (96%)	207 (97%)	7 (3%)	0	100	100
1	C	206/224 (92%)	201 (98%)	5 (2%)	0	100	100
1	E	206/224 (92%)	201 (98%)	3 (2%)	2 (1%)	22	37
1	H	209/224 (93%)	204 (98%)	5 (2%)	0	100	100
2	B	217/219 (99%)	207 (95%)	9 (4%)	1 (0%)	38	60
2	D	217/219 (99%)	210 (97%)	7 (3%)	0	100	100
2	F	217/219 (99%)	211 (97%)	5 (2%)	1 (0%)	38	60
2	L	217/219 (99%)	209 (96%)	8 (4%)	0	100	100
All	All	1703/1772 (96%)	1650 (97%)	49 (3%)	4 (0%)	56	78

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	103	SER
1	E	101	SER
2	B	62	SER
2	F	62	SER

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	A	188/192 (98%)	165 (88%)	23 (12%)	7	12
1	C	184/192 (96%)	164 (89%)	20 (11%)	9	16
1	E	184/192 (96%)	161 (88%)	23 (12%)	7	11
1	H	186/192 (97%)	166 (89%)	20 (11%)	9	16
2	B	196/196 (100%)	175 (89%)	21 (11%)	10	17
2	D	196/196 (100%)	175 (89%)	21 (11%)	10	17
2	F	196/196 (100%)	176 (90%)	20 (10%)	11	18
2	L	196/196 (100%)	176 (90%)	20 (10%)	11	18
All	All	1526/1552 (98%)	1358 (89%)	168 (11%)	9	15

All (168) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	LEU
1	A	11	LEU
1	A	13	LYS
1	A	43	LYS
1	A	45	LEU
1	A	50	THR
1	A	63	VAL
1	A	82(C)	LEU
1	A	94	ARG
1	A	110	GLN
1	A	112	THR
1	A	120	LYS
1	A	129	LEU
1	A	147	VAL
1	A	155	VAL
1	A	156	THR
1	A	164	LEU
1	A	166	SER
1	A	176	GLN
1	A	186	VAL
1	A	199	THR
1	A	211	VAL
1	A	218	SER
2	B	1	ASN
2	B	21	MET
2	B	24	LYS
2	B	33	SER
2	B	34	ASN
2	B	39	LEU
2	B	59	THR
2	B	62	SER
2	B	69	THR
2	B	84	VAL
2	B	98	LEU
2	B	99	SER
2	B	109	THR
2	B	141	CYS
2	B	143	LEU
2	B	150	ASP
2	B	154	LYS
2	B	171	THR
2	B	186	LEU
2	B	201	CYS

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Mol	Chain	Res	Type
2	B	219	ASN
1	C	4	LEU
1	C	11	LEU
1	C	13	LYS
1	C	43	LYS
1	C	45	LEU
1	C	50	THR
1	C	63	VAL
1	C	82(C)	LEU
1	C	93	THR
1	C	94	ARG
1	C	110	GLN
1	C	112	THR
1	C	120	LYS
1	C	129	LEU
1	C	147	VAL
1	C	176	GLN
1	C	186	VAL
1	C	199	THR
1	C	211	VAL
1	C	218	SER
2	D	1	ASN
2	D	14	SER
2	D	21	MET
2	D	24	LYS
2	D	33	SER
2	D	34	ASN
2	D	39	LEU
2	D	59	THR
2	D	69	THR
2	D	84	VAL
2	D	98	LEU
2	D	99	SER
2	D	109	THR
2	D	141	CYS
2	D	143	LEU
2	D	150	ASP
2	D	154	LYS
2	D	171	THR
2	D	186	LEU
2	D	201	CYS
2	D	219	ASN

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Mol	Chain	Res	Type
1	E	4	LEU
1	E	11	LEU
1	E	13	LYS
1	E	35	SER
1	E	43	LYS
1	E	45	LEU
1	E	50	THR
1	E	63	VAL
1	E	82(C)	LEU
1	E	94	ARG
1	E	104	TYR
1	E	110	GLN
1	E	112	THR
1	E	120	LYS
1	E	129	LEU
1	E	147	VAL
1	E	153	GLU
1	E	155	VAL
1	E	176	GLN
1	E	186	VAL
1	E	199	THR
1	E	211	VAL
1	E	218	SER
2	F	1	ASN
2	F	21	MET
2	F	24	LYS
2	F	33	SER
2	F	34	ASN
2	F	39	LEU
2	F	59	THR
2	F	62	SER
2	F	69	THR
2	F	84	VAL
2	F	99	SER
2	F	109	THR
2	F	141	CYS
2	F	143	LEU
2	F	154	LYS
2	F	171	THR
2	F	186	LEU
2	F	201	CYS
2	F	218	ARG

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Mol	Chain	Res	Type
2	F	219	ASN
1	H	4	LEU
1	H	11	LEU
1	H	13	LYS
1	H	43	LYS
1	H	45	LEU
1	H	50	THR
1	H	82(C)	LEU
1	H	94	ARG
1	H	110	GLN
1	H	112	THR
1	H	120	LYS
1	H	129	LEU
1	H	147	VAL
1	H	155	VAL
1	H	176	GLN
1	H	186	VAL
1	H	199	THR
1	H	209	THR
1	H	211	VAL
1	H	218	SER
2	L	1	ASN
2	L	21	MET
2	L	24	LYS
2	L	33	SER
2	L	34	ASN
2	L	39	LEU
2	L	59	THR
2	L	62	SER
2	L	69	THR
2	L	98	LEU
2	L	99	SER
2	L	109	THR
2	L	141	CYS
2	L	143	LEU
2	L	150	ASP
2	L	154	LYS
2	L	171	THR
2	L	186	LEU
2	L	201	CYS
2	L	219	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no

such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

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	218/224 (97%)	0.42	18 (8%) 11 10	40, 58, 102, 139	0
1	C	212/224 (94%)	0.33	16 (7%) 14 14	38, 60, 101, 137	0
1	E	212/224 (94%)	0.22	9 (4%) 35 36	30, 53, 99, 146	0
1	H	215/224 (95%)	0.13	15 (6%) 16 15	30, 44, 85, 135	0
2	B	219/219 (100%)	0.54	21 (9%) 8 8	38, 65, 103, 153	0
2	D	219/219 (100%)	0.45	17 (7%) 13 12	37, 69, 121, 132	0
2	F	219/219 (100%)	0.33	13 (5%) 22 22	32, 62, 106, 122	0
2	L	219/219 (100%)	0.01	9 (4%) 35 37	27, 49, 91, 114	0
All	All	1733/1772 (97%)	0.30	118 (6%) 17 17	27, 58, 105, 153	0

All (118) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	164	ASN	6.7
1	H	100	GLY	5.5
1	A	102	SER	5.3
2	D	1	ASN	5.3
1	C	101	SER	5.1
2	B	32	SER	5.1
1	C	198	VAL	5.0
2	D	191	ASP	4.8
1	A	103	SER	4.8
1	H	163	SER	4.7
1	A	104	TYR	4.6
2	D	32	SER	4.4
2	B	164	ASN	4.4
2	B	31	TYR	4.3
1	H	101	SER	4.2
2	D	164	ASN	4.1

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Mol	Chain	Res	Type	RSRZ
1	C	102	SER	4.1
1	A	188	VAL	4.0
1	A	196	GLN	4.0
2	B	33	SER	4.0
2	D	31	TYR	4.0
1	C	218	SER	3.9
2	F	33	SER	3.9
1	H	161	SER	3.8
1	C	160	ASN	3.6
1	A	161	SER	3.6
2	D	195	ARG	3.6
2	F	32	SER	3.5
1	E	198	VAL	3.5
2	L	164	ASN	3.5
1	H	162	GLY	3.5
2	D	162	ARG	3.4
1	H	218	SER	3.4
1	C	98	TYR	3.3
2	F	176	LYS	3.1
2	B	56	TRP	3.1
1	H	98	TYR	3.1
1	C	120	LYS	3.0
1	A	198	VAL	3.0
2	B	30	LEU	3.0
2	F	31	TYR	3.0
2	F	113	ILE	3.0
1	H	160	ASN	3.0
2	L	195	ARG	2.9
2	B	38	TYR	2.9
1	E	103	SER	2.9
2	B	24	LYS	2.8
2	B	34	ASN	2.8
1	H	219	GLY	2.8
1	A	98	TYR	2.8
2	L	32	SER	2.8
1	A	164	LEU	2.8
2	B	138	SER	2.8
1	E	159	TRP	2.7
2	D	193	TYR	2.7
1	A	119	ALA	2.7
2	F	141	CYS	2.7
2	B	82	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	H	99	SER	2.6
1	C	161	SER	2.6
1	C	103	SER	2.6
1	H	102	SER	2.6
1	C	1	GLU	2.6
2	B	29	VAL	2.5
1	E	218	SER	2.5
2	D	40	ALA	2.5
2	B	55	TYR	2.5
2	B	76	ASP	2.5
2	D	190	LYS	2.5
2	F	192	GLU	2.5
1	A	197	THR	2.5
2	D	135	GLY	2.5
2	D	141	CYS	2.4
1	H	198	VAL	2.4
1	C	219	GLY	2.4
1	E	177	SER	2.4
1	E	145	CYS	2.4
2	D	157	ILE	2.4
1	E	219	GLY	2.4
1	H	197	THR	2.4
1	A	1	GLU	2.4
2	F	34	ASN	2.3
1	A	192	THR	2.3
2	L	33	SER	2.3
2	B	62	SER	2.3
1	H	1	GLU	2.3
2	D	34	ASN	2.3
1	C	99	SER	2.2
2	B	73	SER	2.2
2	F	190	LYS	2.2
1	E	176	GLN	2.2
2	F	116	ALA	2.2
2	L	3	MET	2.2
1	A	151	PHE	2.2
2	B	17	GLU	2.2
2	L	34	ASN	2.2
2	D	155	TRP	2.2
2	B	195	ARG	2.1
1	A	118	SER	2.1
1	C	191	SER	2.1

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Mol	Chain	Res	Type	RSRZ
2	F	62	SER	2.1
2	L	219	ASN	2.1
2	B	101	TYR	2.1
1	E	214	LYS	2.1
1	C	3	GLN	2.1
2	D	196	HIS	2.1
2	F	56	TRP	2.1
1	A	96	GLY	2.1
1	A	120	LYS	2.1
2	L	31	TYR	2.1
1	C	196	GLN	2.1
2	B	127	PRO	2.1
1	A	162	GLY	2.0
2	L	35	GLN	2.0
2	D	188	LEU	2.0
1	H	196	GLN	2.0
1	C	197	THR	2.0
2	B	75	THR	2.0

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.