Full wwPDB X-ray Structure Validation Report (i)

May 15, 2025 – 12:29 PM EDT

PDB ID	:	9NII / pdb_00009nii
Title	:	Crystal structure of citrullinated Tenascin-C restricted PB TCR
Authors	:	Dao, H.T.; Loh, T.J.; Lim, J.J.; Rossjohn, J.
Deposited on	:	2025-02-26
Resolution	:	2.75 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 (i) 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 (1)) were used in the production of this report:

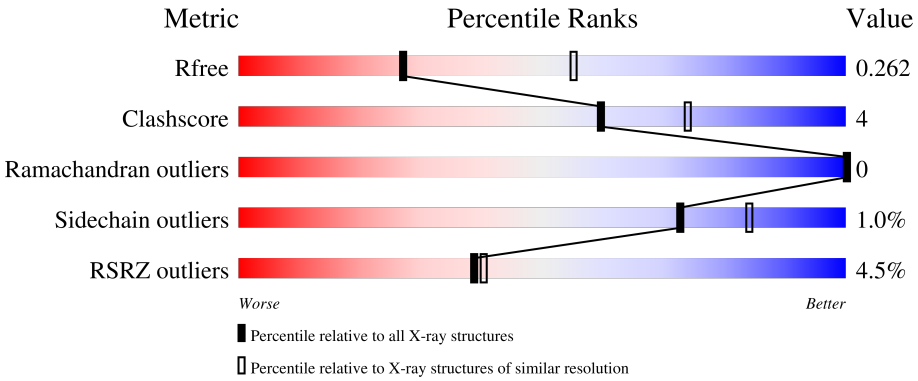
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 2.75 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}	164625	1606 (2.78-2.74)
Clashscore	180529	1689 (2.78-2.74)
Ramachandran outliers	177936	1665 (2.78-2.74)
Sidechain outliers	177891	1665 (2.78-2.74)
RSRZ outliers	164620	1606 (2.78-2.74)

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 <=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	208	6% 90% 9%
1	C	208	7% 81% 16%
1	E	208	7% 88% 10%
1	G	208	5% 90% 8%
2	B	239	3% 87% 13%

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Mol	Chain	Length	Quality of chain
2	D	239	2% 86% 14%
2	F	239	3% 90% 10%
2	H	239	4% 88% 12%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 13573 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.

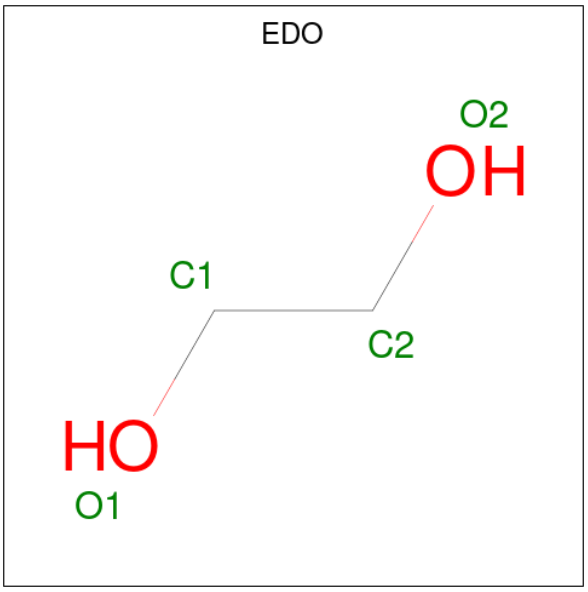
- Molecule 1 is a protein called PB TCR alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	205	Total	C	N	O	S	0	0	0
			1504	941	243	313	7			
1	A	206	Total	C	N	O	S	0	0	0
			1509	942	244	316	7			
1	C	202	Total	C	N	O	S	0	0	0
			1476	925	242	301	8			
1	E	204	Total	C	N	O	S	0	0	0
			1516	952	249	306	9			

- Molecule 2 is a protein called PB TCR beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	238	Total	C	N	O	S	0	0	0
			1842	1172	315	348	7			
2	B	239	Total	C	N	O	S	0	0	0
			1858	1179	321	351	7			
2	D	239	Total	C	N	O	S	0	2	0
			1896	1203	331	355	7			
2	F	239	Total	C	N	O	S	0	1	0
			1897	1202	327	361	7			

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0

- Molecule 4 is water.

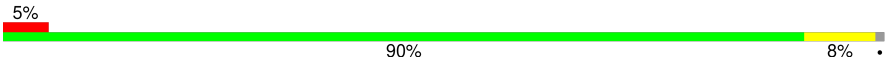
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	G	4	Total O 4 4	0	0
4	H	7	Total O 7 7	0	0
4	A	3	Total O 3 3	0	0
4	B	13	Total O 13 13	0	0
4	C	4	Total O 4 4	0	0
4	D	17	Total O 17 17	0	0
4	E	6	Total O 6 6	0	0
4	F	13	Total O 13 13	0	0

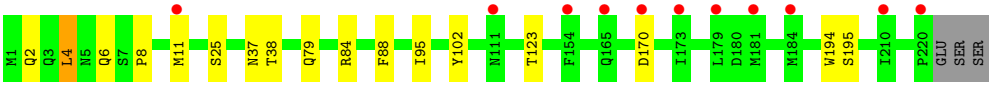
3 Residue-property plots (i)

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: PB TCR alpha chain

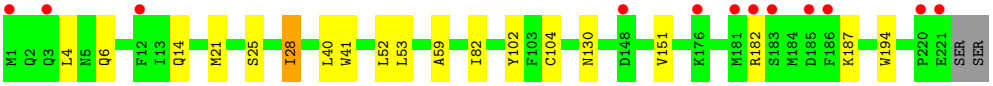
Chain G:





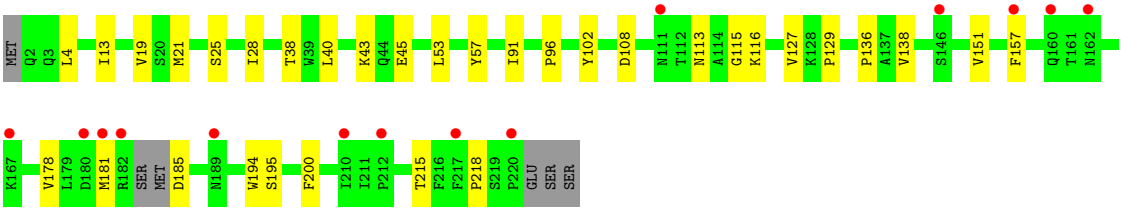
• Molecule 1: PB TCR alpha chain

Chain A:



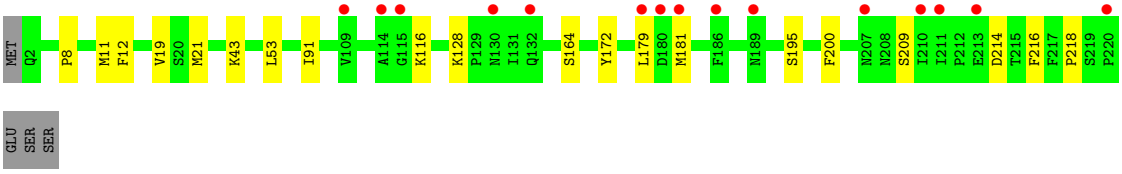
• Molecule 1: PB TCR alpha chain

Chain C:



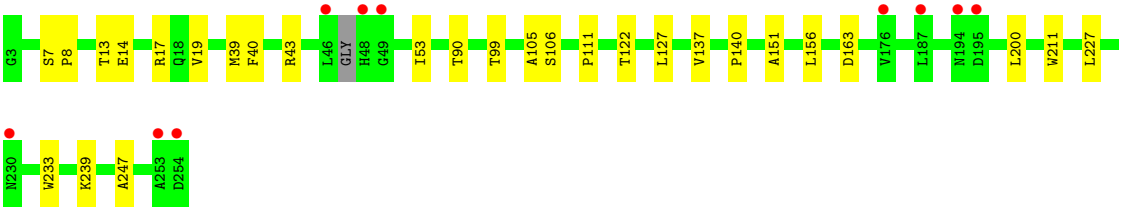
• Molecule 1: PB TCR alpha chain

Chain E:

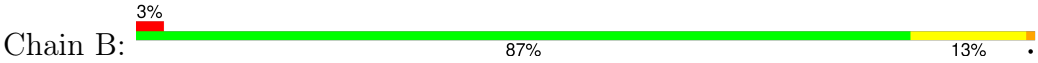


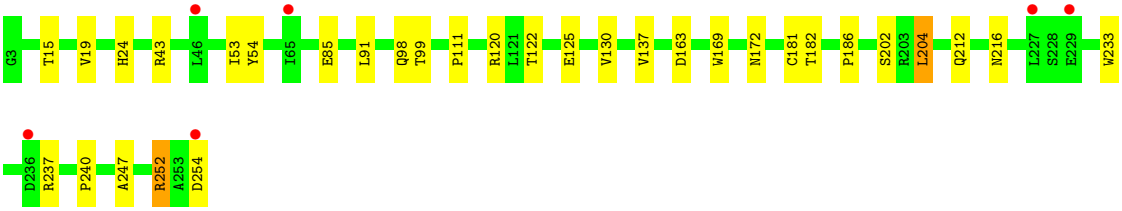
• Molecule 2: PB TCR beta chain

Chain H:

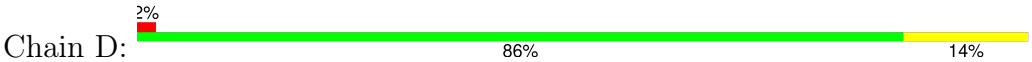


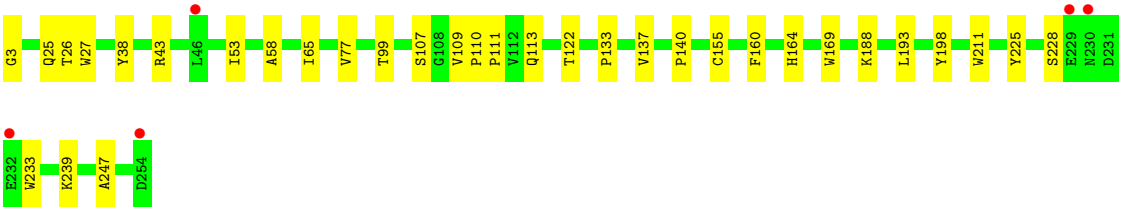
• Molecule 2: PB TCR beta chain



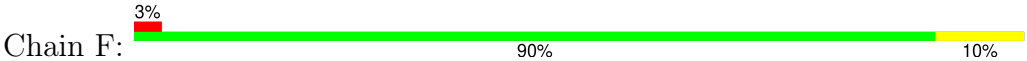


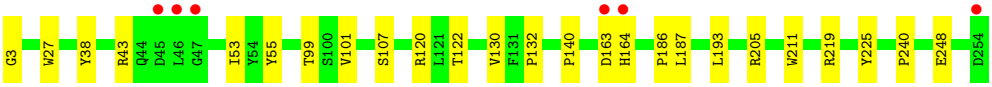
• Molecule 2: PB TCR beta chain





• Molecule 2: PB TCR beta chain





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	109.26Å 119.80Å 176.30Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.84 – 2.75 47.84 – 2.75	Depositor EDS
% Data completeness (in resolution range)	99.6 (47.84-2.75) 99.6 (47.84-2.75)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.85 (at 2.77Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.233 , 0.264 0.232 , 0.262	Depositor DCC
R_{free} test set	3030 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	57.6	Xtriage
Anisotropy	0.789	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 35.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	13573	wwPDB-VP
Average B, all atoms (Å^2)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 33.73 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 7.6385e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: EDO

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	0.09	0/1541	0.26	0/2105
1	C	0.11	0/1507	0.28	0/2055
1	E	0.11	0/1549	0.27	0/2110
1	G	0.11	0/1536	0.26	0/2098
2	B	0.11	0/1914	0.28	0/2621
2	D	0.09	0/1952	0.26	0/2665
2	F	0.11	0/1953	0.30	0/2669
2	H	0.11	0/1896	0.27	0/2593
All	All	0.10	0/13848	0.27	0/18916

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	A	1509	0	1362	13	0
1	C	1476	0	1339	18	0
1	E	1516	0	1406	12	0
1	G	1504	0	1367	10	0
2	B	1858	0	1718	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1896	0	1786	18	0
2	F	1897	0	1778	14	0
2	H	1842	0	1700	16	0
3	C	8	0	12	0	0
4	A	3	0	0	0	0
4	B	13	0	0	0	0
4	C	4	0	0	0	0
4	D	17	0	0	0	0
4	E	6	0	0	0	0
4	F	13	0	0	0	0
4	G	4	0	0	0	0
4	H	7	0	0	0	0
All	All	13573	0	12468	110	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 4.

All (110) 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:F:219:ARG:HG3	2:F:248:GLU:HG2	1.72	0.72
2:H:99:THR:HG23	2:H:122:THR:HA	1.79	0.63
2:H:40:PHE:HB2	2:H:105:ALA:HB3	1.81	0.62
2:F:99:THR:HG23	2:F:122:THR:HA	1.82	0.62
2:D:99:THR:HG23	2:D:122:THR:HA	1.82	0.61
2:B:43:ARG:HH12	2:B:98:GLN:HA	1.66	0.60
2:D:3:GLY:N	2:D:26:THR:HG1	1.98	0.60
1:G:4:LEU:HD12	1:G:25:SER:HB2	1.83	0.60
1:G:37:ASN:OD1	1:G:84:ARG:NH1	2.33	0.60
1:E:172:TYR:HB3	2:F:187:LEU:HD21	1.82	0.60
1:C:38:THR:HG22	1:C:57:TYR:HA	1.83	0.59
1:E:164:SER:H	1:E:209:SER:HB3	1.69	0.57
1:E:214:ASP:OD1	1:E:214:ASP:N	2.36	0.57
1:C:43:LYS:HE2	1:C:45:GLU:HG2	1.87	0.56
2:F:164:HIS:HB3	2:F:225:TYR:HB2	1.88	0.56
2:B:53:ILE:HG22	2:B:54:TYR:HD1	1.70	0.56
2:B:172:ASN:HD21	2:B:216:ASN:HA	1.70	0.56
1:G:38:THR:HG21	2:H:111:PRO:HG3	1.88	0.54
2:D:58:ALA:HB3	2:D:65:ILE:HD12	1.90	0.53
1:E:19:VAL:HB	1:E:91:ILE:HB	1.89	0.53
2:B:233:TRP:NE1	2:B:237:ARG:O	2.42	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:136:PRO:HB2	1:C:215:THR:HG22	1.91	0.52
1:A:40:LEU:HD12	1:A:52:LEU:HD21	1.92	0.52
2:D:233:TRP:HB2	2:D:239:LYS:HD3	1.91	0.52
1:C:4:LEU:HD23	1:C:25:SER:HB3	1.93	0.51
2:F:140:PRO:HD2	2:F:211:TRP:CZ2	2.45	0.51
1:G:6:GLN:NE2	1:G:102:TYR:O	2.43	0.51
1:A:187:LYS:HD2	2:B:181:CYS:SG	2.51	0.51
2:D:133:PRO:HB3	2:D:160:PHE:HB3	1.92	0.50
2:F:38:TYR:HB2	2:F:107:SER:HB2	1.93	0.50
1:C:19:VAL:HB	1:C:91:ILE:HB	1.94	0.50
1:C:96:PRO:HA	1:C:127:VAL:HB	1.94	0.50
2:D:140:PRO:HD2	2:D:211:TRP:CZ2	2.47	0.49
1:A:21:MET:HE1	1:A:102:TYR:CG	2.47	0.49
1:C:21:MET:HE1	1:C:102:TYR:HB2	1.94	0.49
1:A:14:GLN:NE2	1:A:130:ASN:OD1	2.42	0.49
2:B:120:ARG:NH2	2:B:163:ASP:OD2	2.46	0.49
2:D:137:VAL:HG23	2:D:247:ALA:HB3	1.93	0.49
2:B:137:VAL:HG23	2:B:247:ALA:HB3	1.95	0.49
2:B:182:THR:HG23	2:B:202:SER:HB2	1.95	0.48
1:A:59:ALA:HB1	1:A:82:ILE:HA	1.95	0.48
1:C:40:LEU:HD21	2:D:111:PRO:HG2	1.95	0.48
2:H:233:TRP:HB2	2:H:239:LYS:HD3	1.95	0.48
1:C:129:PRO:HG3	1:C:178:VAL:HG13	1.96	0.47
1:A:4:LEU:HD23	1:A:25:SER:HB2	1.96	0.47
2:H:43:ARG:HB3	2:H:53:ILE:HD11	1.96	0.47
2:B:53:ILE:HG22	2:B:54:TYR:CD1	2.50	0.47
2:F:132:PRO:HD3	2:F:240:PRO:HB3	1.97	0.47
2:H:90:THR:HG21	2:D:109:VAL:HG11	1.96	0.47
1:E:8:PRO:HD2	1:E:11:MET:HE2	1.96	0.46
1:G:8:PRO:HG2	1:G:11:MET:HG3	1.98	0.46
2:B:252:ARG:NH1	2:B:254:ASP:O	2.48	0.46
2:B:15:THR:HG21	2:B:125:GLU:HG2	1.98	0.46
2:F:3:GLY:HA2	2:F:27:TRP:CZ2	2.51	0.46
1:G:6:GLN:NE2	1:G:123:THR:HG23	2.31	0.46
2:D:43:ARG:HB3	2:D:53:ILE:HD11	1.98	0.46
1:E:195:SER:HB3	1:E:200:PHE:CG	2.50	0.46
2:D:164:HIS:HB3	2:D:225:TYR:HB2	1.98	0.45
2:D:38:TYR:HB2	2:D:107[A]:SER:HB2	1.99	0.45
1:E:43:LYS:HB2	1:E:53:LEU:HD11	1.97	0.45
2:H:137:VAL:HG23	2:H:247:ALA:HB3	1.98	0.45
1:A:53:LEU:HD23	1:A:53:LEU:HA	1.86	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:43:LYS:HB2	1:C:53:LEU:HD11	1.99	0.44
2:D:3:GLY:HA2	2:D:27:TRP:CZ2	2.52	0.44
2:F:43:ARG:HB3	2:F:53:ILE:HD11	1.99	0.44
1:E:12:PHE:CE1	1:E:128:LYS:HG3	2.53	0.44
2:D:188:LYS:HG3	2:D:198:TYR:HE1	1.83	0.44
1:G:194:TRP:CD2	2:H:156:LEU:HD21	2.53	0.44
1:E:11:MET:HE1	1:E:21:MET:HE2	2.00	0.43
1:C:151:VAL:HG12	1:C:194:TRP:HB3	1.99	0.43
1:C:181:MET:O	1:C:185:ASP:HB3	2.19	0.43
1:E:179:LEU:HD11	2:F:205:ARG:HB2	1.99	0.43
1:C:138:VAL:O	1:C:218:PRO:HD2	2.18	0.43
2:H:13:THR:HG21	2:H:19:VAL:HG21	2.01	0.43
2:H:127:LEU:HD22	2:H:227:LEU:HD11	2.00	0.43
2:F:101:VAL:HG22	2:F:120:ARG:HG2	2.01	0.43
2:B:212:GLN:HA	2:B:252:ARG:O	2.19	0.42
2:F:130:VAL:HG12	2:F:240:PRO:HB2	2.01	0.42
2:H:7:SER:HA	2:H:8:PRO:HA	1.87	0.42
1:E:216:PHE:CZ	1:E:218:PRO:HB3	2.54	0.42
1:E:116:LYS:HD2	2:F:55:TYR:CE1	2.55	0.42
2:D:155:CYS:HB2	2:D:169:TRP:CZ2	2.54	0.42
2:D:228:SER:O	2:D:239:LYS:NZ	2.53	0.42
1:C:113:ASN:HB3	1:C:116:LYS:HD3	2.01	0.42
2:H:163:ASP:OD1	2:H:163:ASP:N	2.37	0.42
1:C:195:SER:HB3	1:C:200:PHE:CG	2.55	0.42
1:G:79:GLN:HB3	1:G:88:PHE:CE2	2.54	0.42
2:B:163:ASP:HB2	2:B:186:PRO:HG2	2.02	0.42
2:B:169:TRP:CE3	2:B:204:LEU:HD12	2.54	0.42
1:C:115:GLY:HA2	2:D:110:PRO:HB3	2.02	0.42
2:H:140:PRO:HD2	2:H:211:TRP:CZ2	2.55	0.41
1:A:182:ARG:HE	1:A:182:ARG:HB2	1.50	0.41
2:B:99:THR:HG23	2:B:122:THR:HA	2.01	0.41
1:A:6:GLN:NE2	1:A:102:TYR:O	2.53	0.41
1:G:6:GLN:HE21	1:G:123:THR:HG23	1.85	0.41
2:F:163:ASP:CG	2:F:186:PRO:HG2	2.45	0.41
2:B:130:VAL:HG12	2:B:240:PRO:HB2	2.03	0.41
2:H:14:GLU:HB2	2:H:17:ARG:HG3	2.03	0.41
1:A:28:ILE:H	1:A:28:ILE:HG13	1.57	0.40
2:B:19:VAL:HG13	2:B:91:LEU:HD13	2.04	0.40
1:C:108:ASP:HB2	1:C:113:ASN:O	2.21	0.40
2:H:39:MET:HA	2:H:106:SER:HA	2.03	0.40
1:A:40:LEU:HD21	2:B:111:PRO:HG2	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:TRP:CH2	1:A:104:CYS:HB3	2.56	0.40
2:B:24:HIS:CE1	2:B:85:GLU:HG3	2.56	0.40
1:C:136:PRO:HB3	1:C:157:PHE:HA	2.03	0.40
2:H:140:PRO:HG2	2:H:151:ALA:HB1	2.03	0.40
1:G:170:ASP:O	1:G:195:SER:OG	2.35	0.40
2:D:107[A]:SER:OG	2:D:113:GLN:HG2	2.21	0.40
1:A:151:VAL:HG12	1:A:194:TRP:HB3	2.03	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	204/208 (98%)	198 (97%)	6 (3%)	0	100	100
1	C	198/208 (95%)	192 (97%)	6 (3%)	0	100	100
1	E	202/208 (97%)	191 (95%)	11 (5%)	0	100	100
1	G	203/208 (98%)	194 (96%)	9 (4%)	0	100	100
2	B	237/239 (99%)	227 (96%)	10 (4%)	0	100	100
2	D	239/239 (100%)	229 (96%)	10 (4%)	0	100	100
2	F	238/239 (100%)	226 (95%)	12 (5%)	0	100	100
2	H	234/239 (98%)	225 (96%)	9 (4%)	0	100	100
All	All	1755/1788 (98%)	1682 (96%)	73 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar

resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	163/184 (89%)	162 (99%)	1 (1%)	84	90
1	C	157/184 (85%)	155 (99%)	2 (1%)	65	80
1	E	166/184 (90%)	165 (99%)	1 (1%)	84	90
1	G	163/184 (89%)	160 (98%)	3 (2%)	54	72
2	B	196/209 (94%)	194 (99%)	2 (1%)	73	84
2	D	203/209 (97%)	200 (98%)	3 (2%)	60	76
2	F	205/209 (98%)	204 (100%)	1 (0%)	86	92
2	H	192/209 (92%)	191 (100%)	1 (0%)	86	92
All	All	1445/1572 (92%)	1431 (99%)	14 (1%)	73	84

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	2	GLN
1	G	4	LEU
1	G	95	ILE
2	H	200	LEU
1	A	28	ILE
2	B	204	LEU
2	B	252	ARG
1	C	13	ILE
1	C	28	ILE
2	D	25	GLN
2	D	77	VAL
2	D	193	LEU
1	E	181	MET
2	F	193	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	G	5	ASN
1	G	6	GLN
1	G	79	GLN
1	G	90	ASN

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Mol	Chain	Res	Type
1	G	162	ASN
2	H	149	GLN
1	A	140	GLN
2	B	86	ASN
2	B	172	ASN
2	B	213	ASN
2	B	216	ASN
2	B	223	GLN
2	B	243	GLN
2	D	185	GLN
1	E	22	ASN
1	E	207	ASN
2	F	147	HIS
2	F	217	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry

2 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	EDO	C	302	-	3,3,3	0.43	0	2,2,2	0.41	0
3	EDO	C	301	-	3,3,3	0.43	0	2,2,2	0.37	0

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
3	EDO	C	302	-	-	0/1/1/1	-
3	EDO	C	301	-	-	0/1/1/1	-

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 (i)

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, 95^{th} 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	206/208 (99%)	0.52	12 (5%)	30	32	43, 72, 103, 123	0
1	C	202/208 (97%)	0.45	14 (6%)	24	27	41, 63, 111, 123	0
1	E	204/208 (98%)	0.47	15 (7%)	22	25	43, 62, 102, 127	0
1	G	205/208 (98%)	0.58	11 (5%)	32	34	46, 74, 103, 112	0
2	B	239/239 (100%)	0.31	6 (2%)	58	59	45, 73, 100, 109	0
2	D	239/239 (100%)	0.02	5 (2%)	63	64	21, 49, 85, 96	2 (0%)
2	F	239/239 (100%)	0.03	6 (2%)	58	59	26, 52, 88, 104	1 (0%)
2	H	238/239 (99%)	0.40	10 (4%)	41	42	48, 70, 105, 120	0
All	All	1772/1788 (99%)	0.34	79 (4%)	39	40	21, 64, 101, 127	3 (0%)

All (79) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	254	ASP	6.7
2	H	254	ASP	6.3
2	F	46	LEU	4.1
2	B	254	ASP	4.1
1	A	148	ASP	4.0
1	E	210	ILE	3.9
1	C	220	PRO	3.9
1	A	221	GLU	3.8
2	H	46	LEU	3.7
1	A	186	PHE	3.7
2	D	254	ASP	3.6
2	H	176	VAL	3.5
2	H	230	ASN	3.4
2	D	230	ASN	3.4
2	H	48	HIS	3.3
1	G	220	PRO	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	3	GLN	3.2
1	E	179	LEU	3.2
1	E	186	PHE	3.2
1	G	184	MET	3.1
1	A	1	MET	3.1
1	C	180	ASP	3.1
1	C	162	ASN	3.1
2	H	253	ALA	3.1
1	G	173	ILE	2.9
1	C	181	MET	2.9
2	H	195	ASP	2.9
1	C	111	ASN	2.8
1	C	210	ILE	2.8
1	A	181	MET	2.8
1	A	185	ASP	2.7
2	H	187	LEU	2.7
1	G	179	LEU	2.7
1	G	170	ASP	2.7
1	G	111	ASN	2.7
2	H	49	GLY	2.7
1	E	211	ILE	2.6
1	E	180	ASP	2.6
1	E	213	GLU	2.5
2	B	236	ASP	2.5
1	C	157	PHE	2.5
1	C	217	PHE	2.5
2	B	229	GLU	2.4
1	E	181	MET	2.4
2	F	45	ASP	2.4
1	E	189	ASN	2.4
1	E	115	GLY	2.4
2	B	46	LEU	2.3
2	D	46	LEU	2.3
1	C	182	ARG	2.3
1	E	207	ASN	2.3
1	G	11	MET	2.3
1	C	212	PRO	2.3
1	E	220	PRO	2.3
1	G	181	MET	2.3
2	D	232	GLU	2.3
1	A	183	SER	2.3
1	E	109	VAL	2.3

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Mol	Chain	Res	Type	RSRZ
1	G	154	PHE	2.3
2	F	164	HIS	2.2
1	A	12	PHE	2.2
1	E	130	ASN	2.2
1	C	160	GLN	2.2
1	C	189	ASN	2.2
2	H	194	ASN	2.2
1	G	165	GLN	2.2
1	E	132	GLN	2.1
2	F	47	GLY	2.1
2	B	227	LEU	2.1
2	D	229	GLU	2.1
1	A	176	LYS	2.1
2	F	163	ASP	2.1
1	G	210	ILE	2.1
2	B	65	ILE	2.1
1	C	146	SER	2.0
1	E	114	ALA	2.0
1	A	220	PRO	2.0
1	C	167	LYS	2.0
1	A	182	ARG	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, 95^{th} 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	EDO	C	301	4/4	0.84	0.21	68,70,70,71	0
3	EDO	C	302	4/4	0.86	0.17	67,67,67,67	0

6.5 Other polymers (i)

There are no such residues in this entry.