Full wwPDB X-ray Structure Validation Report ⓘ

Jun 22, 2021 – 12:11 PM BST

PDB ID	:	6ZQK
Title	:	HER2-binding scFv-Fab fusion 841
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Deposited on	:	2020-07-09
Resolution	:	2.20 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see references ①) were used in the production of this report:

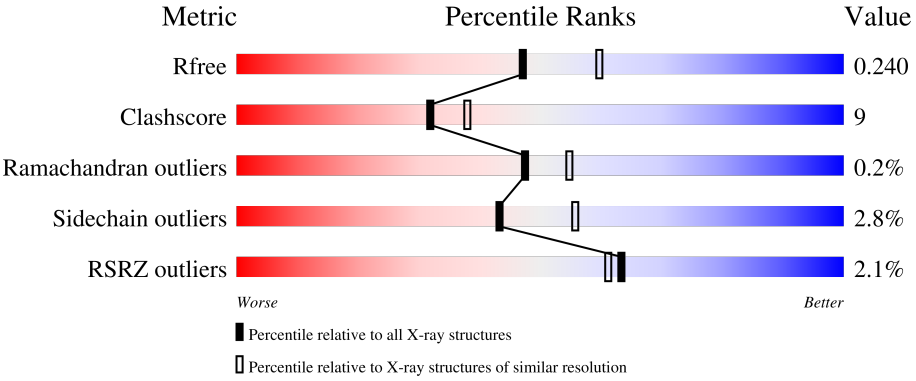
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.20
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.20

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 2.20 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	469	79% 15% • 6%
1	C	469	74% 19% • 6%
2	B	223	82% 14% •
2	D	223	75% 20% •

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
3	EDO	A	503	-	-	-	X
3	EDO	C	502	-	-	-	X
3	EDO	C	503	-	-	-	X

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 20423 atoms, of which 9893 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.

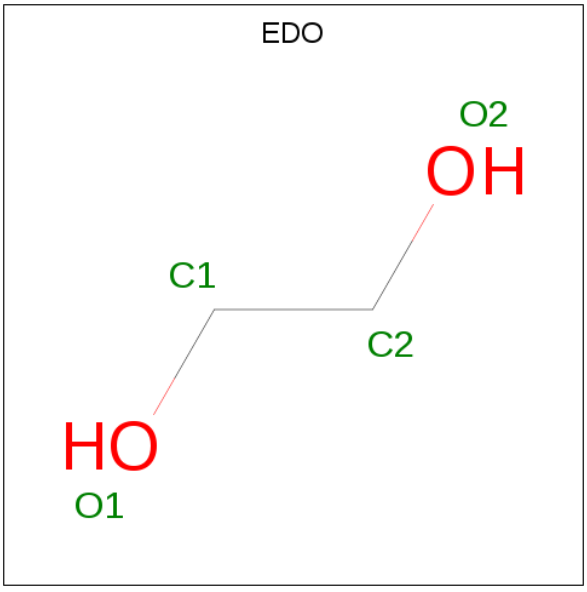
- Molecule 1 is a protein called 841 heavy chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	442	Total	C	H	N	O	S	0	0	0
			6767	2170	3327	582	677	11			
1	C	443	Total	C	H	N	O	S	0	7	0
			6852	2196	3364	595	686	11			

- Molecule 2 is a protein called 841 light chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	215	Total	C	H	N	O	S	0	0	0
			3194	1029	1566	267	325	7			
2	D	213	Total	C	H	N	O	S	0	3	0
			3209	1036	1570	267	329	7			

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	C	1	Total C H O 10 2 6 2	0	0
3	C	1	Total C H O 10 2 6 2	0	0
3	C	1	Total C H O 10 2 6 2	0	0
3	C	1	Total C H O 10 2 6 2	0	0
3	D	1	Total C H O 10 2 6 2	0	0
3	D	1	Total C H O 10 2 6 2	0	0

- Molecule 4 is water.

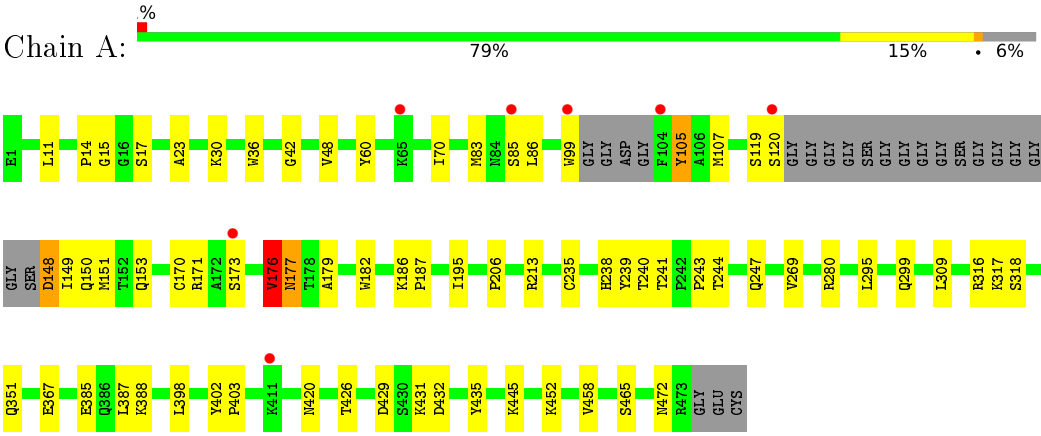
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	90	Total O 90 90	0	0
4	B	56	Total O 56 56	0	0
4	C	97	Total O 97 97	0	0
4	D	48	Total O 48 48	0	0

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.

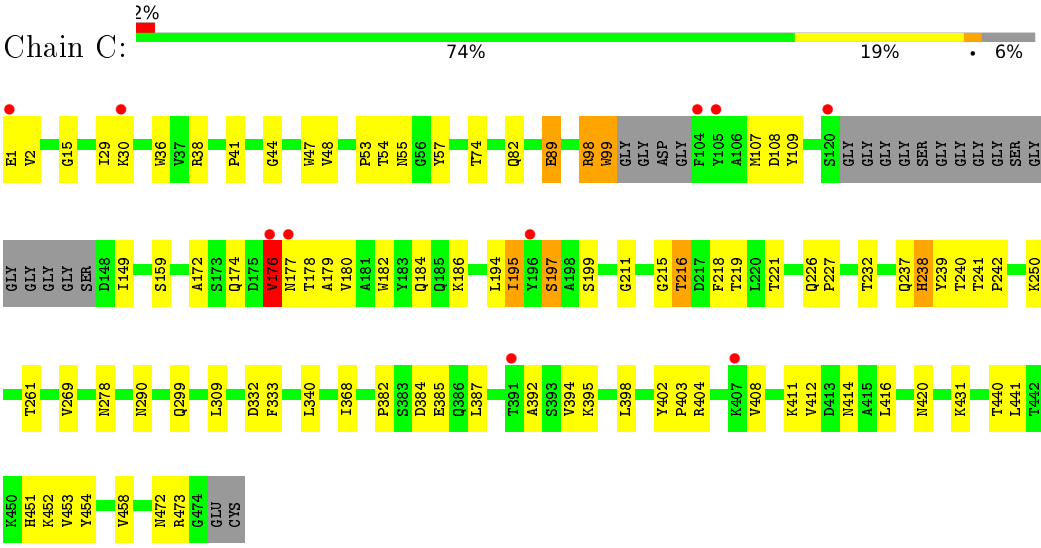
- Molecule 1: 841 heavy chain

Chain A:



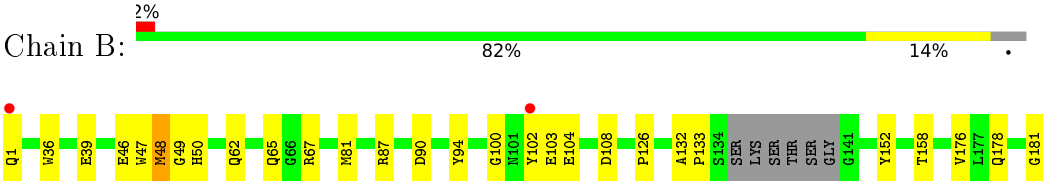
- Molecule 1: 841 heavy chain

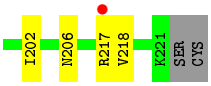
Chain C:



- Molecule 2: 841 light chain

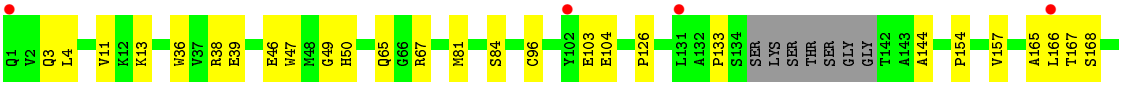
Chain B:





- Molecule 2: 841 light chain

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	51.08Å 75.64Å 88.60Å 103.56° 90.33° 107.13°	Depositor
Resolution (Å)	48.69 – 2.20 48.70 – 2.20	Depositor EDS
% Data completeness (in resolution range)	92.1 (48.69-2.20) 92.1 (48.70-2.20)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.93 (at 2.20Å)	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.202 , 0.241 0.202 , 0.240	Depositor DCC
R_{free} test set	2870 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	45.0	Xtriage
Anisotropy	0.192	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 38.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.054 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	20423	wwPDB-VP
Average B, all atoms (Å^2)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.22% of the height of the origin peak. No significant pseudotranslation is detected.*

[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	0.30	0/3522	0.52	1/4786 (0.0%)
1	C	0.31	0/3584	0.51	0/4868
2	B	0.33	0/1668	0.55	0/2272
2	D	0.32	0/1680	0.58	0/2290
All	All	0.31	0/10454	0.53	1/14216 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	1
All	All	0	2

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	177	ASN	N-CA-CB	-5.95	99.89	110.60

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	176	VAL	Peptide
1	C	176	VAL	Peptide

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	3440	3327	3334	54	3
1	C	3488	3364	3361	76	1
2	B	1628	1566	1573	17	2
2	D	1639	1570	1573	33	3
3	A	20	30	30	3	0
3	C	16	24	24	1	1
3	D	8	12	12	1	0
4	A	90	0	0	15	0
4	B	56	0	0	4	0
4	C	97	0	0	12	0
4	D	48	0	0	11	0
All	All	10530	9893	9907	179	5

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 9.

All (179) 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)
1:C:15:GLY:O	4:C:601:HOH:O	1.66	1.12
1:C:451:HIS:O	1:C:473:ARG:NH1	1.94	1.00
2:D:133:PRO:O	4:D:402:HOH:O	1.87	0.93
1:C:449:GLU:OE1	1:C:473:ARG:NE	2.02	0.92
2:D:46:GLU:OE1	4:D:401:HOH:O	1.87	0.91
1:C:257:ASP:OD2	4:C:602:HOH:O	1.88	0.91
2:B:46:GLU:OE1	4:B:301:HOH:O	1.88	0.90
1:C:250:LYS:NZ	4:C:605:HOH:O	1.99	0.89
1:A:367:GLU:OE1	1:A:435:TYR:OH	1.93	0.86
2:D:165:ALA:O	4:D:403:HOH:O	1.94	0.84
2:D:167:THR:N	4:D:403:HOH:O	2.10	0.82
1:C:74:THR:O	4:C:604:HOH:O	1.98	0.81
1:A:148:ASP:N	1:A:148:ASP:OD1	2.13	0.81
1:A:149:ILE:O	1:A:244:THR:HG21	1.82	0.80
1:C:159:SER:OG	4:C:603:HOH:O	1.97	0.80
2:B:181:GLY:O	4:B:302:HOH:O	2.01	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:351:GLN:NE2	4:A:608:HOH:O	2.16	0.77
1:A:171:ARG:HD2	4:A:613:HOH:O	1.84	0.77
1:A:83:MET:HB3	1:A:86:LEU:HD21	1.66	0.77
1:A:187:PRO:O	4:A:601:HOH:O	2.05	0.74
1:C:82:GLN:NE2	4:C:610:HOH:O	2.19	0.74
2:D:65:GLN:O	4:D:404:HOH:O	2.05	0.73
2:B:39:GLU:OE1	4:B:303:HOH:O	2.08	0.71
1:C:182:TRP:CD1	1:C:195:ILE:HD11	2.25	0.71
1:C:385:GLU:N	1:C:385:GLU:OE2	2.24	0.70
2:D:167:THR:HG22	4:D:403:HOH:O	1.90	0.70
1:A:11:LEU:HD11	1:A:119:SER:HB3	1.74	0.70
1:A:14:PRO:HG3	1:A:120:SER:HA	1.73	0.69
1:C:261:THR:O	4:C:607:HOH:O	2.11	0.68
2:D:210:SER:HG	2:D:212:THR:HG1	1.42	0.67
1:C:269:VAL:HG22	1:C:340:LEU:HD22	1.76	0.67
1:C:452:LYS:HA	1:C:473:ARG:HH12	1.59	0.67
2:D:181:GLY:O	4:D:406:HOH:O	2.12	0.67
2:B:62:GLN:HG2	4:B:310:HOH:O	1.94	0.66
1:A:151:MET:O	4:A:604:HOH:O	2.13	0.66
1:A:426:THR:O	4:A:603:HOH:O	2.13	0.66
2:D:39:GLU:OE2	4:D:405:HOH:O	2.12	0.66
1:A:318:SER:O	4:A:605:HOH:O	2.14	0.65
1:C:149:ILE:HD12	1:C:240:THR:HG22	1.76	0.65
2:D:157:VAL:HG13	2:D:206:ASN:O	1.97	0.65
1:A:171:ARG:O	4:A:606:HOH:O	2.15	0.65
1:A:179:ALA:HB3	1:A:239:TYR:HB2	1.79	0.65
1:A:23:ALA:O	4:A:607:HOH:O	2.15	0.63
2:D:202:ILE:CD1	2:D:217:ARG:HG2	2.28	0.63
1:C:395:LYS:NZ	1:C:440:THR:OG1	2.22	0.62
2:D:210:SER:OG	2:D:212:THR:OG1	2.17	0.62
1:A:149:ILE:HD12	1:A:240:THR:HG22	1.81	0.61
1:A:317:LYS:NZ	2:B:108:ASP:OD2	2.28	0.61
1:A:206:PRO:HD3	3:A:502:EDO:H12	1.81	0.61
1:C:41:PRO:O	4:C:609:HOH:O	2.16	0.60
2:D:202:ILE:HD12	2:D:217:ARG:HG2	1.84	0.59
1:A:150:GLN:HB2	1:A:173:SER:HB3	1.85	0.58
1:C:186:LYS:NZ	4:C:617:HOH:O	2.36	0.58
2:B:132:ALA:HA	2:B:218:VAL:HG12	1.86	0.58
1:C:179:ALA:HB3	1:C:239:TYR:HB2	1.87	0.57
1:C:215:GLY:O	1:C:216:THR:HG22	2.03	0.57
1:C:452:LYS:HA	1:C:473:ARG:NH1	2.20	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:11:VAL:HG21	2:D:154:PRO:HG3	1.87	0.56
1:C:184:GLN:HB2	1:C:194:LEU:HD11	1.87	0.56
1:C:232:THR:OG1	4:C:606:HOH:O	2.10	0.56
1:A:105:TYR:HD2	1:A:238:HIS:O	1.89	0.55
1:C:278[B]:ASN:ND2	1:C:333:PHE:O	2.40	0.55
1:A:269:VAL:HG22	1:A:340:LEU:HD22	1.88	0.55
1:A:176:VAL:HG12	1:A:239:TYR:HB3	1.89	0.55
1:C:99:TRP:CE3	1:C:99:TRP:HA	2.41	0.54
1:C:448:TYR:HA	1:C:454:TYR:OH	2.08	0.54
1:A:295:LEU:HD22	1:A:351:GLN:O	2.09	0.53
1:C:47:TRP:CZ3	1:C:242:PRO:HB3	2.43	0.53
1:C:451:HIS:C	1:C:473:ARG:HH12	2.09	0.53
1:A:299:GLN:HB2	1:A:309:LEU:HD11	1.91	0.53
1:C:29:ILE:HD12	1:C:53:PRO:CG	2.38	0.53
1:C:408:VAL:HG22	1:C:458:VAL:HG22	1.91	0.53
1:A:99:TRP:NE1	4:A:602:HOH:O	2.12	0.52
2:D:175:ALA:HA	2:D:185:LEU:HB3	1.91	0.52
1:A:151:MET:HB3	1:A:170:CYS:SG	2.50	0.52
1:C:411:LYS:HE3	1:C:416:LEU:HD13	1.92	0.51
1:A:241:THR:HG23	1:A:243:PRO:HD3	1.92	0.51
1:C:1:GLU:HG3	1:C:1:GLU:O	2.11	0.51
1:C:299:GLN:HB2	1:C:309:LEU:HD11	1.91	0.51
1:C:395:LYS:HD3	1:C:440:THR:OG1	2.10	0.50
1:A:153:GLN:HG3	1:A:235:CYS:SG	2.51	0.50
1:C:395:LYS:HZ2	2:D:186:GLU:CD	2.15	0.50
1:C:441:LEU:HD21	1:C:443:LEU:HD11	1.94	0.50
2:D:67:ARG:HG2	2:D:84:SER:O	2.12	0.50
1:C:395:LYS:HZ3	1:C:440:THR:HG1	1.51	0.49
2:D:201:TYR:O	2:D:202:ILE:HD13	2.12	0.49
2:B:67:ARG:NH2	2:B:90:ASP:OD2	2.45	0.49
1:C:241:THR:HG23	1:C:242:PRO:HA	1.93	0.49
1:C:99:TRP:HA	1:C:99:TRP:HE3	1.78	0.49
1:C:290:ASN:HD22	3:C:502:EDO:H12	1.78	0.48
2:B:176:VAL:O	2:B:178:GLN:NE2	2.46	0.48
1:C:216:THR:HG23	1:C:216:THR:O	2.13	0.48
1:C:2:VAL:HG13	1:C:109:TYR:CE2	2.48	0.48
2:B:100:GLY:HA3	2:B:104:GLU:O	2.14	0.48
2:D:166:LEU:CA	4:D:403:HOH:O	2.62	0.48
1:A:280:ARG:HA	1:A:331:THR:O	2.14	0.47
1:C:452:LYS:HD2	1:C:453:VAL:HG23	1.96	0.47
1:A:452:LYS:O	1:A:472:ASN:O	2.32	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:99:TRP:CZ3	1:C:107:MET:HG3	2.49	0.47
2:B:81:MET:HE1	2:B:94:TYR:CD2	2.49	0.47
1:A:105:TYR:HB3	1:A:238:HIS:HB2	1.96	0.47
2:D:36:TRP:CE2	2:D:81:MET:HB2	2.50	0.47
2:D:166:LEU:HA	4:D:403:HOH:O	2.14	0.47
1:A:429:ASP:HB3	1:A:432:ASP:OD1	2.15	0.46
1:C:55:ASN:CG	4:C:608:HOH:O	2.53	0.46
2:D:157:VAL:HG22	2:D:207:HIS:CD2	2.49	0.46
1:A:247:GLN:N	1:A:247:GLN:OE1	2.49	0.46
1:A:402:TYR:CG	1:A:403:PRO:HA	2.51	0.46
1:A:36:TRP:O	1:A:48:VAL:HG22	2.15	0.46
2:D:104:GLU:CG	2:D:104:GLU:O	2.65	0.45
2:B:126:PRO:HB3	2:B:152:TYR:HB3	1.98	0.45
1:C:172:ALA:CB	1:C:176:VAL:CG2	2.95	0.45
1:C:226:GLN:HB3	1:C:227:PRO:HD2	1.99	0.45
1:A:15:GLY:HA2	1:A:85:SER:HA	1.97	0.45
1:C:36:TRP:O	1:C:48:VAL:HG22	2.17	0.45
2:D:13:LYS:NZ	4:D:410:HOH:O	2.49	0.45
1:A:420:ASN:N	1:A:420:ASN:OD1	2.50	0.45
1:C:38:ARG:HD3	1:C:48:VAL:HG11	1.99	0.45
1:C:179:ALA:HB1	1:C:238:HIS:CD2	2.52	0.45
1:C:453:VAL:HG22	1:C:472:ASN:OD1	2.17	0.45
1:C:392:ALA:HB3	1:C:443:LEU:O	2.17	0.45
1:C:176:VAL:HG12	1:C:239:TYR:HB3	1.98	0.44
2:D:104:GLU:O	2:D:104:GLU:HG3	2.17	0.44
2:B:202:ILE:HG12	2:B:217:ARG:HG2	1.99	0.44
1:C:412:VAL:HG13	1:C:454:TYR:CE2	2.52	0.44
2:B:133:PRO:HD3	2:B:218:VAL:HG12	2.00	0.44
1:C:384:ASP:HA	1:C:387:LEU:HD12	1.99	0.44
1:A:240:THR:CA	4:A:631:HOH:O	2.66	0.44
1:C:402:TYR:CG	1:C:403:PRO:HA	2.53	0.44
1:C:30:LYS:HE3	1:C:74:THR:HG21	2.00	0.43
1:C:340:LEU:HD23	1:C:368:ILE:HD13	1.99	0.43
1:C:398:LEU:HD12	1:C:398:LEU:N	2.32	0.43
1:A:119:SER:O	1:A:119:SER:OG	2.33	0.43
1:A:182:TRP:HB2	1:A:195:ILE:HB	2.00	0.43
1:C:176:VAL:HG11	1:C:237:GLN:HB2	2.01	0.43
1:C:2:VAL:HG13	1:C:2:VAL:O	2.18	0.43
2:D:103:GLU:O	2:D:104:GLU:HG2	2.18	0.43
1:C:89:GLU:HG2	1:C:89:GLU:O	2.18	0.43
1:C:219:THR:HG22	1:C:221:THR:HG23	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:29:ILE:HD12	1:C:53:PRO:HG3	1.99	0.43
2:D:208:LYS:N	2:D:209:PRO:CD	2.82	0.43
1:C:195:ILE:HD12	1:C:211:GLY:HA3	1.99	0.42
1:C:382:PRO:HD3	1:C:394:VAL:HG22	2.00	0.42
1:A:186:LYS:NZ	4:A:627:HOH:O	2.52	0.42
2:B:47:TRP:CH2	2:B:49:GLY:HA2	2.54	0.42
1:A:149:ILE:HD12	1:A:240:THR:CG2	2.47	0.42
1:A:385:GLU:O	1:A:388:LYS:HB2	2.19	0.42
3:A:501:EDO:C1	4:A:612:HOH:O	2.66	0.42
1:A:60:TYR:CE1	1:A:70:ILE:HG22	2.54	0.42
1:A:239:TYR:C	4:A:631:HOH:O	2.57	0.42
1:C:108:ASP:OD1	1:C:108:ASP:N	2.50	0.42
1:C:441:LEU:HD21	1:C:443:LEU:CD1	2.49	0.42
1:C:55:ASN:ND2	1:C:57:TYR:HB2	2.34	0.42
1:C:98:ARG:NH1	1:C:109:TYR:CD1	2.88	0.42
1:C:180:VAL:HG21	1:C:218:PHE:CZ	2.55	0.42
1:C:197:SER:O	1:C:199:SER:N	2.53	0.42
1:A:387:LEU:HD22	1:A:445:LYS:HG3	2.01	0.42
2:D:201:TYR:C	2:D:202:ILE:HD13	2.40	0.42
1:C:159:SER:HB3	1:C:254:LYS:HA	2.01	0.41
1:A:107:MET:HG3	4:A:602:HOH:O	2.20	0.41
1:A:398:LEU:HD21	1:A:458:VAL:HG13	2.01	0.41
1:A:17:SER:HA	1:A:83:MET:O	2.20	0.41
1:A:42:GLY:H	3:A:504:EDO:H22	1.85	0.41
1:A:179:ALA:HA	1:A:238:HIS:NE2	2.36	0.41
2:D:144:ALA:H	3:D:301:EDO:H22	1.85	0.41
2:D:219:GLU:HB3	2:D:220:PRO:HD2	2.03	0.41
1:A:60:TYR:CZ	1:A:70:ILE:HG22	2.55	0.41
1:C:238:HIS:CD2	1:C:238:HIS:H	2.38	0.41
2:D:47:TRP:CH2	2:D:49:GLY:HA2	2.55	0.41
2:B:158:THR:OG1	2:B:206:ASN:HB3	2.21	0.41
1:C:44:GLY:HA3	4:C:651:HOH:O	2.20	0.41
1:C:55:ASN:HD21	1:C:57:TYR:HB2	1.86	0.40
1:C:149:ILE:HD12	1:C:240:THR:CG2	2.47	0.40
2:B:36:TRP:O	2:B:48:MET:HG3	2.21	0.40
2:D:126:PRO:HD2	2:D:212:THR:HG21	2.03	0.40
1:A:171:ARG:NH1	4:A:613:HOH:O	2.33	0.40
2:D:4:LEU:HD23	2:D:96:CYS:SG	2.61	0.40
1:A:105:TYR:CD2	1:A:238:HIS:O	2.72	0.40
2:B:102:TYR:CD2	2:B:103:GLU:CG	3.05	0.40

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:194:SER:OG	2:D:103:GLU:OE1[1_554]	1.97	0.23
1:A:30:LYS:NZ	3:C:502:EDO:O1[1_455]	2.06	0.14
1:A:431:LYS:NZ	2:D:3:GLN:OE1[1_554]	2.12	0.08
2:B:1:GLN:O	1:C:431:LYS:NZ[1_454]	2.15	0.05
1:A:431:LYS:HZ2	2:D:3:GLN:OE1[1_554]	1.56	0.04

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	436/469 (93%)	417 (96%)	18 (4%)	1 (0%)	47	55
1	C	444/469 (95%)	427 (96%)	16 (4%)	1 (0%)	47	55
2	B	211/223 (95%)	209 (99%)	2 (1%)	0	100	100
2	D	212/223 (95%)	208 (98%)	4 (2%)	0	100	100
All	All	1303/1384 (94%)	1261 (97%)	40 (3%)	2 (0%)	47	55

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	177	ASN
1	C	177	ASN

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	381/388 (98%)	375 (98%)	6 (2%)	62 76
1	C	388/388 (100%)	371 (96%)	17 (4%)	28 35
2	B	183/190 (96%)	179 (98%)	4 (2%)	52 65
2	D	185/190 (97%)	178 (96%)	7 (4%)	33 42
All	All	1137/1156 (98%)	1103 (97%)	34 (3%)	43 53

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	105	TYR
1	A	148	ASP
1	A	176	VAL
1	A	213	ARG
1	A	316	ARG
1	A	465	SER
2	B	48	MET
2	B	50	HIS
2	B	65	GLN
2	B	87	ARG
1	C	54	THR
1	C	89	GLU
1	C	98	ARG
1	C	99	TRP
1	C	174	GLN
1	C	176	VAL
1	C	178	THR
1	C	195	ILE
1	C	197	SER
1	C	216	THR
1	C	238	HIS
1	C	332	ASP
1	C	404[A]	ARG
1	C	404[B]	ARG
1	C	414	ASN
1	C	420	ASN
1	C	449	GLU
2	D	38	ARG
2	D	50	HIS
2	D	168[A]	SER
2	D	168[B]	SER
2	D	180	SER
2	D	204	ASN

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Mol	Chain	Res	Type
2	D	216	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	351	GLN
1	C	399	ASN
1	C	400	ASN
2	D	50	HIS
2	D	171	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 monosaccharides in this entry.

5.6 Ligand geometry

11 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	D	302	-	3,3,3	0.48	0	2,2,2	0.45	0
3	EDO	D	301	-	3,3,3	0.52	0	2,2,2	0.43	0
3	EDO	C	504	-	3,3,3	0.58	0	2,2,2	0.43	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	EDO	A	504	-	3,3,3	0.57	0	2,2,2	0.41	0
3	EDO	A	503	-	3,3,3	0.58	0	2,2,2	0.65	0
3	EDO	A	502	-	3,3,3	0.50	0	2,2,2	0.41	0
3	EDO	C	501	-	3,3,3	0.47	0	2,2,2	0.33	0
3	EDO	C	502	-	3,3,3	0.54	0	2,2,2	0.78	0
3	EDO	A	501	-	3,3,3	0.53	0	2,2,2	0.43	0
3	EDO	C	503	-	3,3,3	0.51	0	2,2,2	0.49	0
3	EDO	A	505	-	3,3,3	0.67	0	2,2,2	0.38	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	D	302	-	-	0/1/1/1	-
3	EDO	D	301	-	-	1/1/1/1	-
3	EDO	C	504	-	-	0/1/1/1	-
3	EDO	A	504	-	-	1/1/1/1	-
3	EDO	A	503	-	-	1/1/1/1	-
3	EDO	A	502	-	-	1/1/1/1	-
3	EDO	C	501	-	-	0/1/1/1	-
3	EDO	C	502	-	-	1/1/1/1	-
3	EDO	A	501	-	-	0/1/1/1	-
3	EDO	C	503	-	-	1/1/1/1	-
3	EDO	A	505	-	-	0/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	502	EDO	O1-C1-C2-O2
3	D	301	EDO	O1-C1-C2-O2
3	A	504	EDO	O1-C1-C2-O2
3	A	503	EDO	O1-C1-C2-O2
3	C	503	EDO	O1-C1-C2-O2
3	C	502	EDO	O1-C1-C2-O2

There are no ring outliers.

5 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	301	EDO	1	0
3	A	504	EDO	1	0
3	A	502	EDO	1	0
3	C	502	EDO	1	1
3	A	501	EDO	1	0

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	442/469 (94%)	0.08	7 (1%)	72	70	29, 58, 87, 109	0
1	C	443/469 (94%)	0.14	10 (2%)	60	58	31, 54, 91, 104	0
2	B	215/223 (96%)	-0.01	4 (1%)	66	65	27, 50, 92, 116	0
2	D	213/223 (95%)	0.06	7 (3%)	46	44	27, 53, 91, 112	0
All	All	1313/1384 (94%)	0.08	28 (2%)	63	61	27, 55, 90, 116	0

All (28) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	218	VAL	5.1
1	A	120	SER	4.6
2	D	197	GLY	4.3
2	B	102	TYR	4.1
2	D	102	TYR	3.7
1	C	176	VAL	3.1
1	C	30	LYS	3.0
1	A	104	PHE	2.9
1	C	1	GLU	2.8
2	D	1	GLN	2.6
1	C	177	ASN	2.6
1	A	411	LYS	2.6
2	D	166	LEU	2.5
1	C	391	THR	2.4
1	C	196	TYR	2.3
2	D	131	LEU	2.3
1	C	120	SER	2.3
2	B	198	THR	2.2
1	A	85	SER	2.2
1	A	173	SER	2.2
1	C	407	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
2	D	220	PRO	2.2
2	B	1	GLN	2.2
1	C	105	TYR	2.1
1	A	99	TRP	2.1
1	C	104	PHE	2.1
2	B	217	ARG	2.1
1	A	65	LYS	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	502	4/4	0.31	0.61	114,182,284,284	0
3	EDO	C	503	4/4	0.56	0.63	103,181,231,231	0
3	EDO	D	301	4/4	0.56	0.19	76,91,98,102	0
3	EDO	A	503	4/4	0.61	0.74	151,268,330,330	0
3	EDO	D	302	4/4	0.79	0.20	79,107,143,143	0
3	EDO	A	502	4/4	0.81	0.32	71,99,130,130	0
3	EDO	A	504	4/4	0.82	0.30	43,52,62,64	0
3	EDO	C	504	4/4	0.82	0.20	79,112,143,143	0
3	EDO	C	501	4/4	0.84	0.18	71,86,94,99	0
3	EDO	A	505	4/4	0.89	0.19	43,53,64,77	0
3	EDO	A	501	4/4	0.95	0.11	56,67,73,73	0

6.5 Other polymers (i)

There are no such residues in this entry.