



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 12:35 AM GMT

PDB ID : 2AV8
Title : Y122F MUTANT OF RIBONUCLEOTIDE REDUCTASE FROM ES-
CHERICHIA COLI
Authors : Han, S.; Arvai, A.; Tainer, J.A.
Deposited on : 1997-09-30
Resolution : 2.46 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

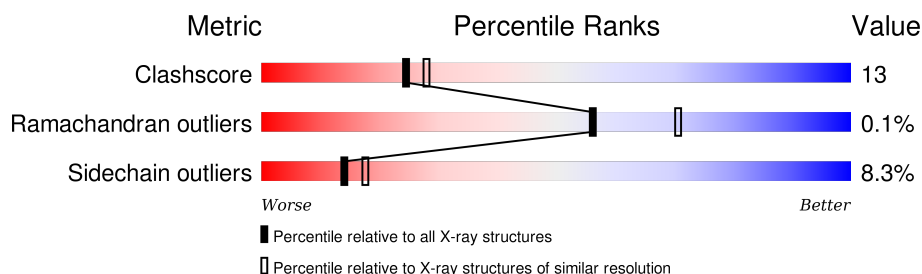
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.46 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))
Clashscore	102246	1030 (2.48-2.44)
Ramachandran outliers	100387	1024 (2.48-2.44)
Sidechain outliers	100360	1024 (2.48-2.44)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	340	 <div>69%</div> <div>29%</div> <div>.</div>
1	B	340	 <div>70%</div> <div>26%</div> <div>.</div>

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5787 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 RIBONUCLEOTIDE REDUCTASE R2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	340	Total	C	N	O	S	0	0	0
			2788	1784	464	527	13			
1	B	340	Total	C	N	O	S	0	0	0
			2788	1784	464	527	13			

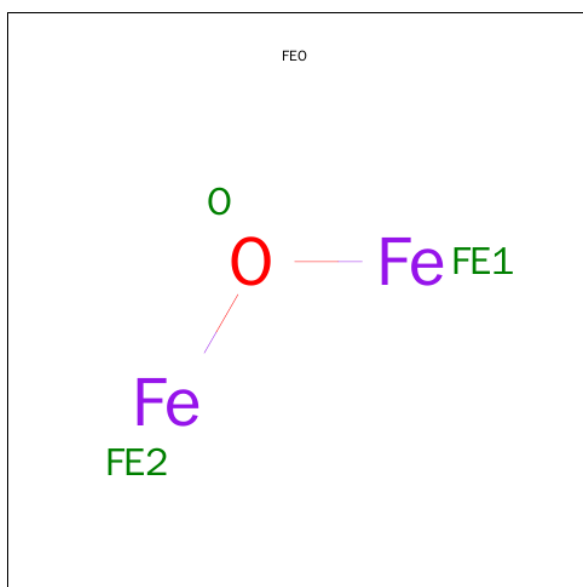
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	122	PHE	TYR	ENGINEERED	UNP P69924
B	122	PHE	TYR	ENGINEERED	UNP P69924

- Molecule 2 is FE (II) ION (three-letter code: FE2) (formula: Fe).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Fe	0	0
			1	1		

- Molecule 3 is MU-OXO-DIIRON (three-letter code: FEO) (formula: Fe₂O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	Fe	O	0	0
			3	2	1		
3	B	1	Total	Fe	O	0	0
			3	2	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	115	Total	O	0	0
			115	115		
4	B	89	Total	O	0	0
			89	89		

Note EDS was not executed.

Chain A:

69% 29%

Amino Acid	Percentage
A1	1.5%
T4	1.5%
T8	1.5%
K9	1.5%
M10	1.5%
D11	1.5%
Q12	1.5%
L13	1.5%
K14	1.5%
F19	1.5%
G20	1.5%
Q21	1.5%
N24	1.5%
V25	1.5%
A26	1.5%
R27	1.5%
K32	1.5%
Y33	1.5%
Q43	1.5%
L44	1.5%
S45	1.5%
F46	1.5%
R49	1.5%
P50	1.5%
E51	1.5%
E52	1.5%
R59	1.5%
Y62	1.5%
L65	1.5%
K70	1.5%
I74	1.5%
K78	1.5%
L82	1.5%
V93	1.5%
A94	1.5%
L95	1.5%
P96	1.5%
P97	1.5%
L98	1.5%
L99	1.5%
S100	1.5%
I101	1.5%
S121	1.5%

Chain B:

4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section will therefore be incomplete.

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	136.50Å 136.50Å 109.60Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	7.00 – 2.46	Depositor
% Data completeness (in resolution range)	97.7 (7.00-2.46)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
Refinement program	X-PLOR 3.8	Depositor
R, R_{free}	0.181 , 0.237	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5787	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: FEO, FE2

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	0.53	0/2852	0.69	2/3867 (0.1%)
1	B	0.51	0/2852	0.67	3/3867 (0.1%)
All	All	0.52	0/5704	0.68	5/7734 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	242	LEU	CA-CB-CG	7.44	132.41	115.30
1	A	328	ARG	NE-CZ-NH2	7.01	123.81	120.30
1	B	242	LEU	CA-CB-CG	6.39	130.01	115.30
1	B	203	LEU	CA-CB-CG	5.81	128.66	115.30
1	B	275	LEU	CA-CB-CG	5.11	127.05	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2788	0	2734	75	0
1	B	2788	0	2734	77	0
2	A	1	0	0	0	0
3	A	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	3	0	0	0	0
4	A	115	0	0	5	0
4	B	89	0	0	10	0
All	All	5787	0	5468	142	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 13.

All (142) 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:B:24:ASN:OD1	1:B:25:VAL:HG12	1.70	0.92
1:A:44:LEU:HB3	1:B:49:ARG:HD3	1.51	0.92
1:A:148:LYS:O	1:A:151:GLU:HG2	1.68	0.91
1:A:151:GLU:HG3	1:A:152:GLY:H	1.39	0.86
1:A:175:HIS:HB3	1:B:178:ASN:HD21	1.39	0.86
1:B:24:ASN:OD1	1:B:25:VAL:N	2.10	0.84
1:B:50:PRO:HB3	1:B:121:SER:HB3	1.61	0.81
1:A:151:GLU:HG3	1:A:152:GLY:N	1.93	0.80
1:A:82:LEU:HD21	1:A:150:ALA:HB2	1.75	0.69
1:A:132:ASP:O	1:A:135:VAL:HG22	1.92	0.69
1:B:27:ARG:HD3	1:B:29:ASP:OD1	1.93	0.68
1:A:250:ASN:OD1	1:A:253:ARG:NH1	2.25	0.68
1:B:123:THR:O	1:B:127:ARG:HG3	1.95	0.67
1:A:49:ARG:HD2	1:A:51:GLU:OE1	1.95	0.66
1:A:125:ILE:HD13	1:A:227:ASN:HD22	1.61	0.65
1:B:89:ARG:HG2	1:B:90:SER:N	2.11	0.65
1:B:326:GLN:O	1:B:328:ARG:HG3	1.98	0.64
1:A:96:LEU:HB3	1:A:97:PRO:HD3	1.81	0.62
1:B:252:LEU:HD22	1:B:261:MET:HG3	1.82	0.62
1:B:250:ASN:ND2	1:B:253:ARG:HH11	1.98	0.61
1:B:49:ARG:HD2	4:B:1206:HOH:O	2.00	0.60
1:A:49:ARG:HD3	1:B:44:LEU:HB3	1.82	0.60
1:B:186:LEU:HG	1:B:190:LYS:HE3	1.82	0.60
1:A:19:PHE:HE1	1:A:189:LEU:HD13	1.67	0.59
1:B:250:ASN:HD22	1:B:253:ARG:HH11	1.51	0.59
1:B:186:LEU:O	1:B:190:LYS:HG3	2.03	0.59
1:B:250:ASN:ND2	1:B:253:ARG:NH1	2.51	0.58
1:B:201:ASN:HD22	1:B:276:PHE:HZ	1.52	0.57
1:B:238:GLU:OE1	1:B:238:GLU:HA	2.03	0.57
1:B:127:ARG:O	1:B:127:ARG:HD3	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:328:ARG:HH11	1:B:328:ARG:HB2	1.69	0.57
1:B:328:ARG:NH1	1:B:328:ARG:HB2	2.20	0.57
1:A:289:TYR:O	1:A:292:ARG:HG3	2.06	0.56
1:B:255:GLY:CA	1:B:262:ALA:HB2	2.36	0.55
1:A:163:MET:HE1	1:A:192:LYS:HE3	1.89	0.55
1:B:163:MET:HE3	4:B:1309:HOH:O	2.07	0.55
1:B:62:TYR:O	1:B:70:LYS:HE3	2.07	0.55
1:B:10:ASN:H	1:B:10:ASN:HD22	1.55	0.54
1:A:95:LEU:O	1:A:99:ILE:HG13	2.06	0.54
1:B:289:TYR:HD1	1:B:292:ARG:HH21	1.56	0.54
1:B:15:GLU:HG3	1:B:16:PRO:HD2	1.90	0.54
1:B:46:PHE:CE2	1:B:236:ARG:HD3	2.43	0.53
1:B:88:GLY:HA2	1:B:115:GLU:HB2	1.89	0.53
1:B:258:ASP:O	1:B:261:MET:HB2	2.08	0.53
1:B:21:GLN:HB3	4:B:1111:HOH:O	2.09	0.53
1:A:59:ARG:NH2	1:A:131:ASN:OD1	2.42	0.53
1:A:101:ILE:HG23	4:A:1087:HOH:O	2.08	0.53
1:B:21:GLN:HG3	4:B:1231:HOH:O	2.08	0.53
1:A:1:ALA:HB3	1:A:168:HIS:HA	1.90	0.53
1:A:163:MET:CE	1:A:192:LYS:HE3	2.39	0.53
1:B:323:LEU:N	1:B:323:LEU:HD23	2.24	0.53
1:B:149:ARG:NH1	1:B:149:ARG:HG2	2.23	0.53
1:A:62:TYR:O	1:A:70:LYS:HD3	2.10	0.52
1:B:176:THR:HA	1:B:180:LYS:O	2.09	0.52
1:B:105:GLU:O	1:B:109:GLU:HG3	2.09	0.52
1:B:24:ASN:OD1	1:B:25:VAL:CG1	2.51	0.52
1:A:198:MET:HE3	1:A:276:PHE:HE1	1.74	0.52
1:A:50:PRO:HB3	1:A:121:SER:HB3	1.91	0.51
1:A:50:PRO:HB3	1:A:121:SER:CB	2.41	0.51
1:A:269:LYS:HE3	1:A:321:LEU:HD23	1.93	0.50
1:A:19:PHE:CE1	1:A:189:LEU:HD13	2.44	0.50
1:A:49:ARG:HB2	1:A:52:GLU:HG2	1.92	0.50
1:B:249:LEU:O	1:B:253:ARG:HG2	2.11	0.50
1:A:43:GLN:CA	1:A:43:GLN:HE21	2.24	0.50
1:A:131:ASN:O	1:A:133:PRO:HD3	2.12	0.50
1:A:198:MET:HE1	1:A:321:LEU:HD11	1.94	0.50
1:A:126:ILE:O	1:A:130:VAL:HG22	2.12	0.50
1:B:145:GLN:HG3	1:B:289:TYR:CE1	2.47	0.49
1:A:255:GLY:CA	1:A:262:ALA:HB2	2.41	0.49
1:B:151:GLU:O	1:B:155:SER:HB2	2.12	0.49
1:A:278:GLN:O	1:A:282:GLN:HG3	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:227:ASN:O	1:A:231:ILE:HG12	2.13	0.49
1:A:145:GLN:HG3	1:A:289:TYR:CE1	2.48	0.49
1:A:149:ARG:O	1:A:153:ILE:HD12	2.13	0.49
1:B:68:HIS:HB2	4:B:1005:HOH:O	2.13	0.49
1:A:127:ARG:NH1	1:B:29:ASP:HA	2.28	0.48
1:B:10:ASN:HD22	1:B:10:ASN:N	2.11	0.48
1:B:149:ARG:HH11	1:B:149:ARG:HG2	1.77	0.48
1:A:44:LEU:CB	1:B:49:ARG:HD3	2.36	0.48
1:B:23:VAL:HA	4:B:1329:HOH:O	2.13	0.48
1:A:332:ILE:O	1:A:332:ILE:HG13	2.13	0.48
1:A:127:ARG:HH11	1:B:29:ASP:HA	1.79	0.47
1:B:78:LYS:HB3	1:B:140:ILE:HG12	1.96	0.47
1:A:204:GLU:OE1	1:A:241:HIS:HB3	2.14	0.47
1:A:32:LYS:HD2	1:A:33:TYR:CE2	2.50	0.47
1:A:198:MET:HE3	1:A:276:PHE:CE1	2.49	0.47
1:A:12:GLN:OE1	1:A:27:ARG:HD3	2.14	0.46
1:B:46:PHE:CD2	1:B:236:ARG:HD3	2.50	0.46
1:A:43:GLN:HA	1:A:43:GLN:HE21	1.81	0.46
1:A:137:PHE:HB3	4:B:1253:HOH:O	2.14	0.46
1:A:46:PHE:CD2	1:A:236:ARG:HD3	2.51	0.46
1:B:289:TYR:O	1:B:292:ARG:HG2	2.16	0.46
1:A:260:GLU:O	1:A:264:ILE:HG13	2.16	0.45
1:A:270:GLN:HB3	4:A:1316:HOH:O	2.16	0.45
1:A:74:ILE:O	1:A:78:LYS:HG3	2.16	0.45
1:A:46:PHE:CE2	1:A:236:ARG:HD3	2.50	0.45
1:B:205:ALA:HB1	1:B:315:ARG:CD	2.46	0.45
1:A:24:ASN:OD1	1:A:25:VAL:N	2.43	0.45
1:B:183:THR:HG23	4:B:1257:HOH:O	2.16	0.45
1:B:236:ARG:NH1	4:B:1044:HOH:O	2.46	0.45
1:A:59:ARG:HB2	1:A:128:ASN:O	2.17	0.44
1:B:180:LYS:HB2	1:B:180:LYS:HE2	1.71	0.44
1:B:73:PHE:CE1	1:B:224:MET:HG2	2.52	0.44
1:A:43:GLN:NE2	1:A:43:GLN:HA	2.32	0.44
1:A:311:ILE:O	1:A:315:ARG:HG2	2.17	0.43
1:A:144:GLU:O	1:A:148:LYS:HB2	2.18	0.43
1:A:43:GLN:HG2	1:A:240:LEU:HD23	1.99	0.43
1:B:125:ILE:HD13	1:B:227:ASN:HD22	1.83	0.43
1:A:4:THR:HB	1:B:90:SER:OG	2.18	0.43
1:A:252:LEU:HD22	1:A:261:MET:HG3	1.99	0.43
1:A:304:LEU:O	1:A:308:VAL:HG23	2.18	0.43
1:A:10:ASN:ND2	1:A:21:GLN:NE2	2.66	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:167:TRP:HA	1:B:184:VAL:HG11	2.01	0.43
1:A:125:ILE:HD13	1:A:227:ASN:ND2	2.31	0.43
1:B:203:LEU:HA	1:B:207:ARG:HD2	2.00	0.43
1:A:65:LEU:HB2	1:A:70:LYS:HG2	2.01	0.43
1:A:93:VAL:HG11	1:B:2:TYR:CE2	2.54	0.43
1:A:49:ARG:HH21	1:B:45:SER:HB3	1.83	0.42
1:A:176:THR:HG23	1:B:178:ASN:HA	2.01	0.42
1:B:286:TRP:CZ3	1:B:289:TYR:CD2	3.07	0.42
1:B:115:GLU:O	1:B:118:HIS:HB2	2.20	0.42
1:A:287:ALA:CB	1:A:304:LEU:HD23	2.49	0.42
1:A:19:PHE:CE1	1:A:98:LEU:HD22	2.54	0.42
1:B:174:THR:HA	1:B:182:VAL:O	2.19	0.42
1:A:10:ASN:ND2	1:A:21:GLN:HE22	2.18	0.42
1:B:129:ILE:HG13	1:B:130:VAL:N	2.34	0.42
1:A:101:ILE:HA	1:A:101:ILE:HD13	1.90	0.42
1:A:236:ARG:HD2	4:A:1052:HOH:O	2.20	0.42
1:B:250:ASN:HD21	1:B:319:VAL:HA	1.84	0.41
1:A:153:ILE:HG23	4:A:1012:HOH:O	2.20	0.41
1:B:77:LEU:HA	1:B:80:GLN:HE21	1.85	0.41
1:B:316:MET:SD	1:B:324:PRO:HD3	2.60	0.41
1:B:49:ARG:HA	1:B:50:PRO:HD2	1.95	0.41
1:A:236:ARG:NH1	4:A:1052:HOH:O	2.48	0.41
1:B:96:LEU:HB3	1:B:97:PRO:HD3	2.03	0.41
1:B:198:MET:CE	1:B:319:VAL:HG21	2.51	0.41
1:B:10:ASN:HB3	4:B:1231:HOH:O	2.21	0.41
1:A:203:LEU:HA	1:A:207:ARG:HD2	2.03	0.41
1:A:177:VAL:HG13	1:A:177:VAL:O	2.21	0.41
1:B:191:LYS:HG3	1:B:264:ILE:HG23	2.01	0.40
1:B:198:MET:HE2	1:B:276:PHE:CE1	2.56	0.40
1:B:205:ALA:HB1	1:B:315:ARG:HD2	2.04	0.40

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	338/340 (99%)	326 (96%)	12 (4%)	0	100	100
1	B	338/340 (99%)	327 (97%)	10 (3%)	1 (0%)	46	57
All	All	676/680 (99%)	653 (97%)	22 (3%)	1 (0%)	56	71

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	269	LYS

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	307/307 (100%)	286 (93%)	21 (7%)	20	26
1	B	307/307 (100%)	277 (90%)	30 (10%)	10	11
All	All	614/614 (100%)	563 (92%)	51 (8%)	14	17

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	THR
1	A	9	LYS
1	A	14	LYS
1	A	43	GLN
1	A	176	THR
1	A	183	THR
1	A	188	GLU
1	A	189	LEU
1	A	195	LEU
1	A	197	LEU
1	A	208	PHE
1	A	242	LEU

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Mol	Chain	Res	Type
1	A	260	GLU
1	A	267	GLU
1	A	269	LYS
1	A	271	GLU
1	A	288	ASP
1	A	290	LEU
1	A	292	ARG
1	A	317	GLN
1	A	339	LEU
1	B	10	ASN
1	B	25	VAL
1	B	27	ARG
1	B	31	GLN
1	B	38	LYS
1	B	51	GLU
1	B	57	ARG
1	B	82	LEU
1	B	89	ARG
1	B	100	SER
1	B	127	ARG
1	B	130	VAL
1	B	131	ASN
1	B	149	ARG
1	B	151	GLU
1	B	163	MET
1	B	169	LEU
1	B	176	THR
1	B	180	LYS
1	B	181	THR
1	B	191	LYS
1	B	195	LEU
1	B	197	LEU
1	B	203	LEU
1	B	208	PHE
1	B	232	ARG
1	B	271	GLU
1	B	288	ASP
1	B	304	LEU
1	B	339	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	10	ASN
1	A	43	GLN
1	A	63	GLN
1	A	147	GLN
1	A	168	HIS
1	A	227	ASN
1	A	247	HIS
1	A	306	GLN
1	A	326	GLN
1	B	10	ASN
1	B	80	GLN
1	B	147	GLN
1	B	178	ASN
1	B	201	ASN
1	B	227	ASN
1	B	246	GLN
1	B	250	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 for Mogul analysis.

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	FEO	A	401	1,4	0,2,2	0.00	-	0,1,1	0.00	-
3	FEO	B	403	1,4	0,2,2	0.00	-	0,1,1	0.00	-

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	FEO	A	401	1,4	-	0/0/0/0	0/0/0/0
3	FEO	B	403	1,4	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section will therefore be empty.

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

EDS was not executed - this section will therefore be empty.

6.3 Carbohydrates [i](#)

EDS was not executed - this section will therefore be empty.

6.4 Ligands [i](#)

EDS was not executed - this section will therefore be empty.

6.5 Other polymers [i](#)

EDS was not executed - this section will therefore be empty.