



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:09 AM GMT

PDB ID : 2ZQZ
Title : R-state structure of allosteric L-lactate dehydrogenase from *Lactobacillus casei*
Authors : Arai, K.; Ishimitsu, T.; Fushinobu, S.; Uchikoba, H.; Matsuzawa, H.; Taguchi, H.
Deposited on : 2008-08-22
Resolution : 2.50 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) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

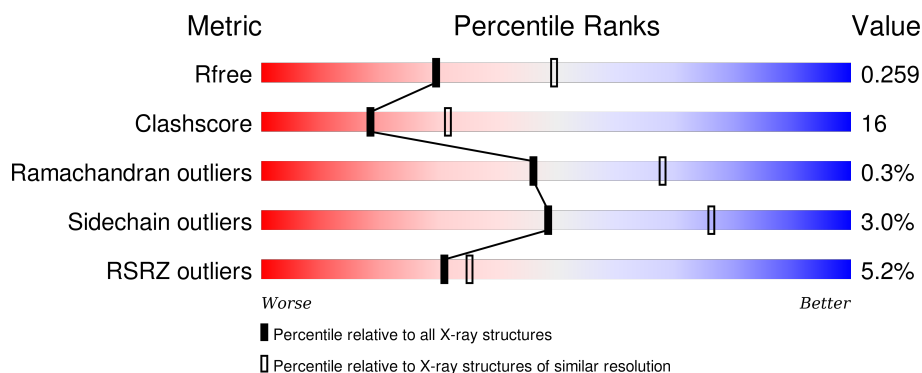
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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}	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

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. 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	A	326	<div> <div>8%</div> <div>66%</div> <div>27%</div> <div>6%</div> </div>
1	B	326	<div> <div>3%</div> <div>71%</div> <div>23%</div> <div>•</div> </div>
1	C	326	<div> <div>3%</div> <div>61%</div> <div>29%</div> <div>•</div> <div>9%</div> </div>
1	D	326	<div> <div>8%</div> <div>62%</div> <div>30%</div> <div>•</div> <div>6%</div> </div>
1	E	326	<div> <div>3%</div> <div>68%</div> <div>26%</div> <div>•</div> <div>•</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	326	<div><div></div><div>4%</div><div>68%</div><div>27%</div><div></div><div></div></div>

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 14550 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 L-lactate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	307	Total	C	N	O	S	0	0	0
			2356	1505	391	454	6			
1	B	313	Total	C	N	O	S	0	0	0
			2399	1531	399	463	6			
1	C	297	Total	C	N	O	S	0	0	0
			2282	1457	378	441	6			
1	D	307	Total	C	N	O	S	0	0	0
			2356	1505	391	454	6			
1	E	312	Total	C	N	O	S	0	0	0
			2394	1528	398	462	6			
1	F	313	Total	C	N	O	S	0	0	0
			2399	1531	399	463	6			

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	C	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	D	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	E	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0
2	F	1	Total O S 5 4 1	0	0

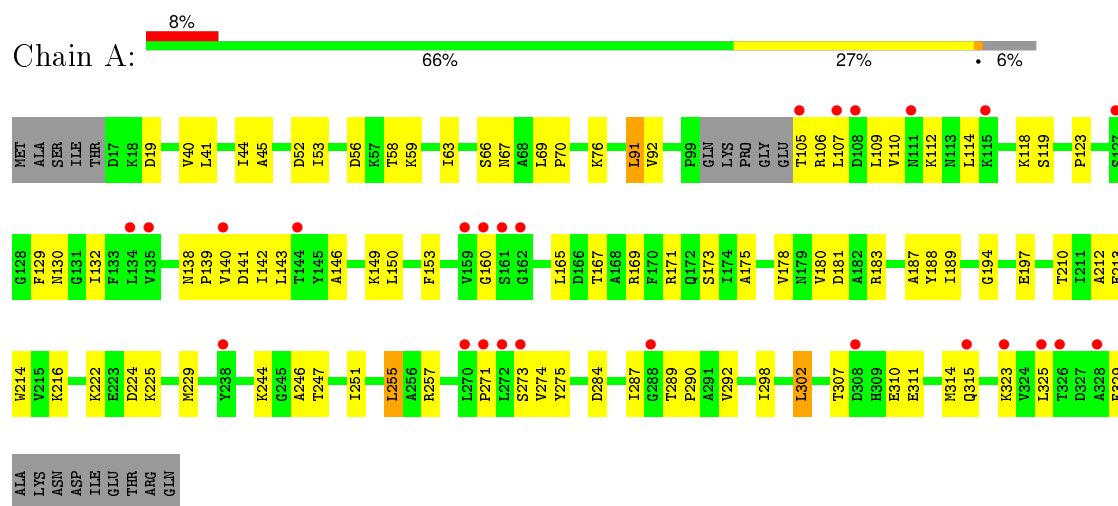
- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	51	Total O 51 51	0	0
3	B	62	Total O 62 62	0	0
3	C	46	Total O 46 46	0	0
3	D	46	Total O 46 46	0	0
3	E	53	Total O 53 53	0	0
3	F	46	Total O 46 46	0	0

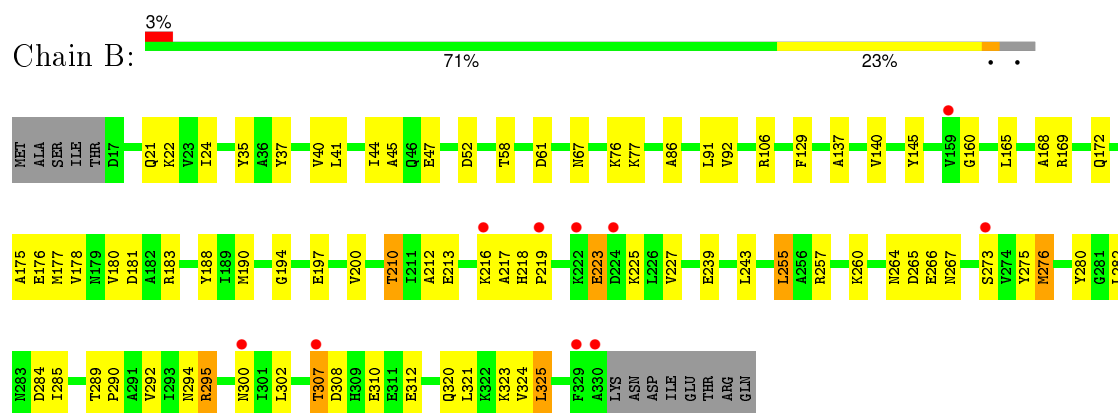
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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 ($\text{RSRZ} > 2$). 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.

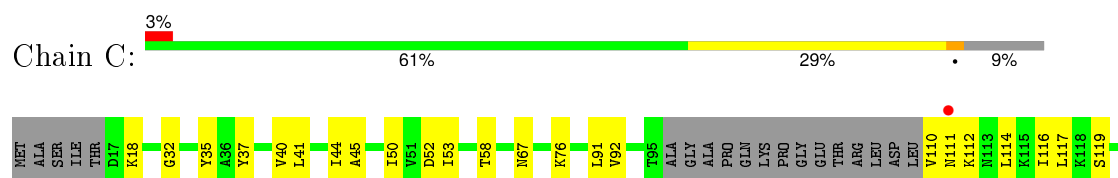
• Molecule 1: L-lactate dehydrogenase

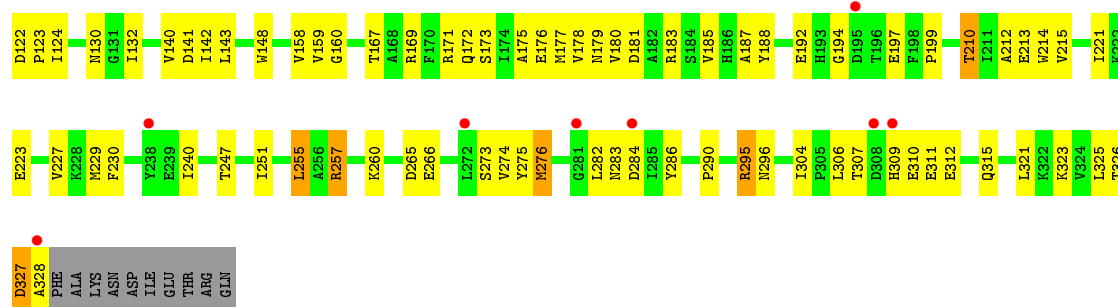


• Molecule 1: L-lactate dehydrogenase

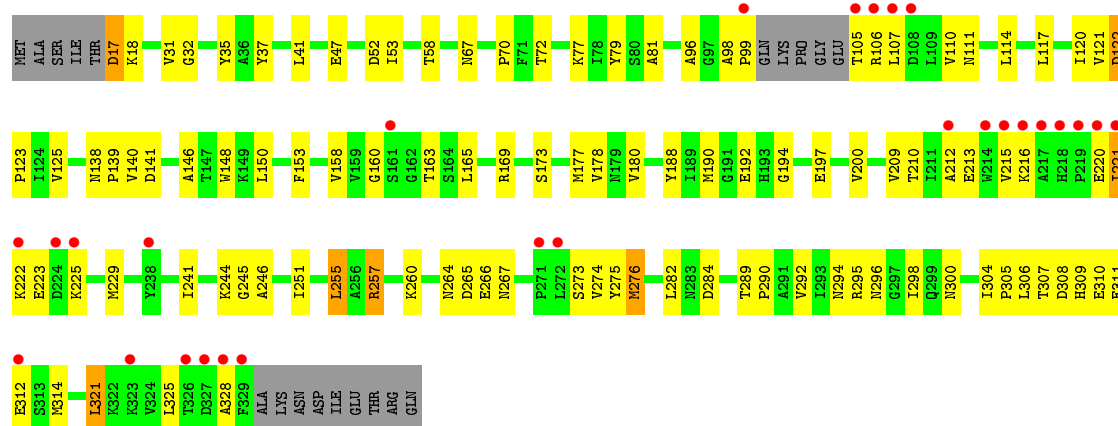


• Molecule 1: L-lactate dehydrogenase

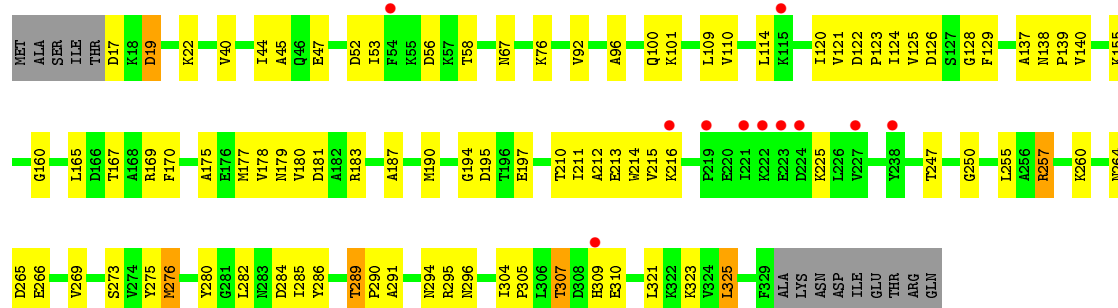




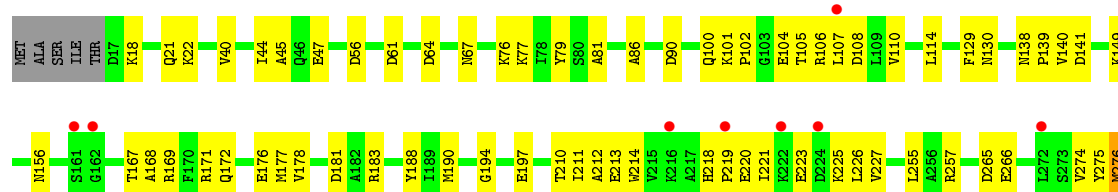
• Molecule 1: L-lactate dehydrogenase

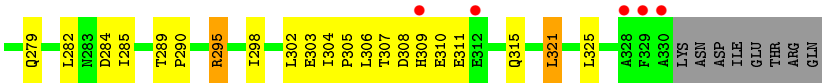


• Molecule 1: L-lactate dehydrogenase



• Molecule 1: L-lactate dehydrogenase





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	164.38Å 82.89Å 179.77Å 90.00° 91.21° 90.00°	Depositor
Resolution (Å)	34.10 – 2.50 34.10 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.1 (34.10-2.50) 90.4 (34.10-2.10)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.64 (at 2.10Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.212 , 0.271 0.215 , 0.259	Depositor DCC
R_{free} test set	6220 reflections (7.42%)	DCC
Wilson B-factor (Å ²)	39.3	Xtriage
Anisotropy	0.388	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 56.2	EDS
Estimated twinning fraction	0.008 for -h,-k,l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	0 of 181408 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14550	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.15% 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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

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: SO4

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	0.34	0/2398	0.61	2/3252 (0.1%)
1	B	0.34	0/2443	0.62	1/3314 (0.0%)
1	C	0.34	0/2322	0.61	0/3148
1	D	0.33	0/2398	0.59	0/3252
1	E	0.35	0/2438	0.60	0/3307
1	F	0.33	0/2443	0.60	0/3314
All	All	0.34	0/14442	0.60	3/19587 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	189	ILE	N-CA-C	-5.28	96.74	111.00
1	A	91	LEU	CA-CB-CG	5.22	127.30	115.30
1	B	91	LEU	CA-CB-CG	5.03	126.87	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	2356	0	2374	72	0
1	B	2399	0	2417	64	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2282	0	2299	88	0
1	D	2356	0	2374	105	0
1	E	2394	0	2412	74	0
1	F	2399	0	2417	70	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	0	0
2	D	10	0	0	0	0
2	E	10	0	0	0	0
2	F	10	0	0	0	0
3	A	51	0	0	5	0
3	B	62	0	0	2	0
3	C	46	0	0	3	0
3	D	46	0	0	5	0
3	E	53	0	0	2	0
3	F	46	0	0	3	0
All	All	14550	0	14293	443	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 16.

All (443) 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:D:276:MET:HG2	1:D:282:LEU:HB2	1.32	1.07
1:C:276:MET:HG2	1:C:282:LEU:HB2	1.34	1.03
1:B:276:MET:HG2	1:B:282:LEU:HB2	1.42	0.99
1:E:210:THR:HG22	1:E:212:ALA:H	1.26	0.99
1:D:210:THR:HG22	1:D:212:ALA:H	1.33	0.94
1:B:307:THR:HG22	1:B:310:GLU:H	1.30	0.92
1:F:190:MET:HE3	1:F:289:THR:HG23	1.52	0.91
1:F:210:THR:HB	1:F:213:GLU:HG3	1.53	0.89
1:D:222:LYS:HB2	1:D:225:LYS:HG3	1.56	0.88
1:E:307:THR:HG22	1:E:310:GLU:H	1.39	0.88
1:E:276:MET:HG2	1:E:282:LEU:HB2	1.56	0.87
1:F:276:MET:HG2	1:F:282:LEU:HB2	1.59	0.83
1:F:265:ASP:OD1	1:F:295:ARG:HB3	1.78	0.83
1:D:210:THR:HB	1:D:213:GLU:HG3	1.63	0.81
1:C:192:GLU:OE2	1:C:321:LEU:HD23	1.81	0.81
1:E:210:THR:HB	1:E:213:GLU:HG3	1.62	0.80
1:D:274:VAL:HG13	1:D:298:ILE:HD13	1.64	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:169:ARG:HD3	1:B:67:ASN:OD1	1.82	0.80
1:D:190:MET:HE3	1:D:289:THR:HG23	1.62	0.79
1:E:212:ALA:O	1:E:216:LYS:HD3	1.83	0.78
1:C:210:THR:HG22	1:C:213:GLU:H	1.48	0.78
1:D:105:THR:HG22	1:D:107:LEU:H	1.46	0.77
1:A:40:VAL:HA	1:A:76:LYS:HE2	1.68	0.75
1:C:290:PRO:HG2	1:C:304:ILE:HD11	1.68	0.75
1:D:212:ALA:O	1:D:215:VAL:HG12	1.85	0.75
1:D:216:LYS:H	1:D:216:LYS:HD2	1.51	0.75
1:A:41:LEU:HD12	1:B:41:LEU:HD12	1.70	0.74
1:E:210:THR:HG22	1:E:212:ALA:N	2.03	0.73
1:A:311:GLU:O	1:A:315:GLN:HG2	1.89	0.72
1:D:122:ASP:HB2	1:D:123:PRO:HD3	1.71	0.72
1:B:40:VAL:HA	1:B:76:LYS:HE2	1.72	0.71
1:B:323:LYS:NZ	1:B:323:LYS:HB3	2.06	0.71
1:B:210:THR:HG22	1:B:213:GLU:H	1.56	0.70
1:C:172:GLN:O	1:C:176:GLU:HG3	1.93	0.69
1:B:210:THR:HB	1:B:213:GLU:HG3	1.73	0.69
1:D:178:VAL:HG12	1:D:180:VAL:HG23	1.74	0.68
1:D:213:GLU:CD	1:E:305:PRO:HG3	2.13	0.68
1:F:274:VAL:HG12	1:F:298:ILE:HD13	1.76	0.68
1:C:295:ARG:HD2	1:D:18:LYS:HB3	1.75	0.67
1:C:212:ALA:O	1:C:215:VAL:HG12	1.93	0.67
1:D:194:GLY:O	1:D:197:GLU:HG2	1.95	0.67
1:A:210:THR:HB	1:A:213:GLU:HG3	1.77	0.67
1:C:223:GLU:O	1:C:227:VAL:HG23	1.93	0.67
1:C:67:ASN:OD1	1:E:169:ARG:HD3	1.95	0.66
1:C:296:ASN:HD21	1:D:18:LYS:HE3	1.59	0.66
1:B:177:MET:HE3	1:B:225:LYS:HE3	1.78	0.66
1:E:177:MET:HE2	1:E:225:LYS:HD3	1.77	0.66
1:A:251:ILE:HG13	1:A:255:LEU:HD22	1.78	0.66
1:C:169:ARG:HH22	1:C:240:ILE:HD12	1.61	0.65
1:B:194:GLY:O	1:B:197:GLU:HG2	1.96	0.65
1:A:105:THR:HG22	1:A:107:LEU:H	1.62	0.65
1:E:307:THR:HG21	3:E:348:HOH:O	1.95	0.65
1:A:194:GLY:O	1:A:197:GLU:HG2	1.96	0.65
1:E:211:ILE:O	1:E:215:VAL:HG23	1.97	0.65
1:E:323:LYS:NZ	1:E:323:LYS:HB3	2.11	0.65
1:F:105:THR:HG22	1:F:108:ASP:H	1.62	0.64
1:C:214:TRP:HZ3	1:F:302:LEU:HD11	1.62	0.64
1:C:265:ASP:OD1	1:C:295:ARG:HB3	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:244:LYS:HE2	1:D:246:ALA:O	1.98	0.63
1:F:275:TYR:CZ	1:F:284:ASP:HA	2.32	0.63
1:C:18:LYS:HB3	1:D:295:ARG:HD2	1.79	0.63
1:E:289:THR:HG22	1:E:290:PRO:HD2	1.80	0.62
1:F:306:LEU:HB3	1:F:310:GLU:HB2	1.80	0.62
1:D:67:ASN:OD1	1:F:169:ARG:HD3	2.00	0.62
1:C:18:LYS:HE2	1:D:296:ASN:HD21	1.64	0.61
1:D:222:LYS:HB2	1:D:225:LYS:CG	2.29	0.61
1:D:138:ASN:HA	1:D:140:VAL:N	2.15	0.61
1:D:307:THR:HB	1:D:310:GLU:HG3	1.81	0.61
1:B:308:ASP:O	1:B:312:GLU:HG3	2.00	0.61
1:D:307:THR:HG22	1:D:308:ASP:N	2.15	0.60
1:D:120:ILE:O	1:D:123:PRO:HD2	2.01	0.60
1:C:194:GLY:O	1:C:197:GLU:HG2	2.01	0.60
1:F:110:VAL:O	1:F:114:LEU:HG	2.02	0.60
1:F:307:THR:HG22	1:F:309:HIS:H	1.66	0.60
1:F:40:VAL:HA	1:F:76:LYS:HE2	1.83	0.60
1:B:289:THR:HG22	1:B:290:PRO:HD2	1.83	0.60
1:A:160:GLY:HA3	1:A:273:SER:OG	2.01	0.60
1:C:173:SER:OG	1:C:229:MET:HG3	2.01	0.60
1:D:215:VAL:HG13	1:D:216:LYS:HD2	1.83	0.59
1:C:40:VAL:HA	1:C:76:LYS:HE2	1.84	0.59
1:E:276:MET:HE2	1:E:276:MET:HA	1.84	0.59
1:D:275:TYR:CZ	1:D:284:ASP:HA	2.37	0.59
1:F:307:THR:HG22	1:F:308:ASP:N	2.16	0.59
1:D:192:GLU:OE2	1:D:321:LEU:HD23	2.02	0.59
1:C:178:VAL:HG12	1:C:180:VAL:HG23	1.85	0.59
1:D:220:GLU:CD	1:D:220:GLU:H	2.06	0.59
1:F:210:THR:HG22	1:F:212:ALA:H	1.68	0.59
1:E:178:VAL:HG12	1:E:180:VAL:HG23	1.84	0.59
1:F:290:PRO:HG2	1:F:304:ILE:HD11	1.85	0.59
1:D:138:ASN:HD22	1:D:140:VAL:H	1.50	0.59
1:B:178:VAL:O	1:B:178:VAL:HG12	2.03	0.59
1:B:86:ALA:O	1:B:129:PHE:HB2	2.02	0.58
1:C:307:THR:CG2	1:C:310:GLU:H	2.15	0.58
1:E:92:VAL:HG11	1:E:124:ILE:HD13	1.85	0.58
1:D:117:LEU:O	1:D:121:VAL:HG23	2.04	0.58
1:B:275:TYR:CZ	1:B:284:ASP:HA	2.38	0.58
1:F:181:ASP:OD2	1:F:183:ARG:HD3	2.03	0.58
1:F:177:MET:HG3	1:F:225:LYS:HZ2	1.69	0.58
1:D:210:THR:HG22	1:D:212:ALA:N	2.12	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:240:ILE:CG2	1:C:247:THR:HG22	2.33	0.58
1:B:172:GLN:O	1:B:176:GLU:HG3	2.04	0.58
1:F:275:TYR:OH	1:F:284:ASP:HA	2.03	0.58
1:B:47:GLU:HG3	1:B:77:LYS:HB3	1.86	0.58
1:C:296:ASN:HD21	1:D:18:LYS:CE	2.17	0.57
1:C:167:THR:HG23	1:C:187:ALA:O	2.03	0.57
1:D:106:ARG:HG2	1:D:106:ARG:HH21	1.69	0.57
1:E:265:ASP:OD1	1:E:294:ASN:HB2	2.05	0.57
1:F:274:VAL:HG12	1:F:298:ILE:CD1	2.34	0.57
1:E:296:ASN:HD21	1:F:18:LYS:HE2	1.70	0.57
1:C:181:ASP:OD2	1:C:183:ARG:HD3	2.05	0.57
1:D:307:THR:O	1:D:311:GLU:HB2	2.04	0.56
1:D:70:PRO:HG2	1:F:168:ALA:HB1	1.86	0.56
1:D:307:THR:HG22	1:D:309:HIS:H	1.71	0.56
1:B:276:MET:CE	1:B:276:MET:HA	2.36	0.56
1:B:276:MET:HE2	1:B:276:MET:HA	1.88	0.56
1:F:105:THR:HG22	1:F:107:LEU:N	2.21	0.56
1:C:306:LEU:HB3	1:C:310:GLU:HB2	1.87	0.56
1:E:137:ALA:O	1:E:140:VAL:HA	2.07	0.55
1:F:100:GLN:HA	1:F:104:GLU:OE1	2.07	0.55
1:D:215:VAL:HA	3:D:350:HOH:O	2.06	0.55
1:D:215:VAL:HG21	1:D:223:GLU:OE1	2.05	0.55
1:A:210:THR:HG22	1:A:213:GLU:H	1.71	0.55
1:E:178:VAL:O	1:E:178:VAL:HG12	2.06	0.55
1:F:178:VAL:HG12	1:F:178:VAL:O	2.07	0.55
1:E:175:ALA:HB1	1:E:180:VAL:O	2.07	0.55
1:A:275:TYR:OH	1:A:284:ASP:HA	2.07	0.55
1:C:210:THR:HG23	3:C:366:HOH:O	2.07	0.55
1:C:323:LYS:HB3	1:C:323:LYS:NZ	2.21	0.55
1:A:210:THR:HG23	3:A:369:HOH:O	2.05	0.55
1:C:169:ARG:HD3	1:E:67:ASN:OD1	2.06	0.55
1:E:155:LYS:HD3	1:E:275:TYR:CD2	2.42	0.54
1:F:188:TYR:CE2	1:F:290:PRO:HG3	2.42	0.54
1:B:265:ASP:OD1	1:B:295:ARG:HB3	2.07	0.54
1:A:119:SER:O	1:A:123:PRO:HG3	2.07	0.54
1:D:221:ILE:O	1:D:222:LYS:HG2	2.07	0.54
1:E:120:ILE:O	1:E:123:PRO:HD2	2.07	0.54
1:D:165:LEU:O	1:D:169:ARG:HG3	2.08	0.54
1:B:323:LYS:HZ2	1:B:323:LYS:HB3	1.72	0.54
1:C:210:THR:HB	1:C:213:GLU:HG3	1.90	0.54
1:D:265:ASP:OD1	1:D:294:ASN:HB2	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:305:PRO:HG3	1:E:213:GLU:CD	2.27	0.54
1:D:138:ASN:HA	1:D:140:VAL:H	1.70	0.54
1:F:194:GLY:O	1:F:197:GLU:HG2	2.08	0.54
1:A:178:VAL:HG12	1:A:178:VAL:O	2.08	0.54
1:F:79:TYR:CE2	1:F:81:ALA:HB2	2.42	0.53
1:A:275:TYR:CZ	1:A:284:ASP:HA	2.44	0.53
1:A:167:THR:O	1:A:171:ARG:HG3	2.07	0.53
1:B:175:ALA:HB1	1:B:180:VAL:O	2.09	0.53
1:F:149:LYS:HG3	3:F:367:HOH:O	2.08	0.53
1:C:110:VAL:HG12	1:C:114:LEU:HD12	1.89	0.53
1:D:17:ASP:N	1:D:17:ASP:OD2	2.40	0.53
1:A:210:THR:HB	1:A:213:GLU:CG	2.39	0.53
1:C:307:THR:HG22	1:C:310:GLU:H	1.74	0.52
1:A:173:SER:OG	1:A:229:MET:HG3	2.10	0.52
1:F:221:ILE:N	1:F:221:ILE:HD12	2.24	0.52
1:E:100:GLN:HB3	1:E:109:LEU:HD13	1.91	0.52
1:D:274:VAL:CG1	1:D:298:ILE:HD13	2.37	0.52
1:B:285:ILE:HD12	1:B:321:LEU:HD12	1.91	0.52
1:C:321:LEU:O	1:C:325:LEU:HB2	2.10	0.52
1:E:269:VAL:HA	1:E:291:ALA:O	2.09	0.52
1:E:260:LYS:O	1:E:264:ASN:HB2	2.10	0.52
1:C:117:LEU:HD22	1:C:143:LEU:HD22	1.92	0.52
1:C:169:ARG:NH2	1:C:240:ILE:HD12	2.25	0.52
1:D:307:THR:CG2	1:D:308:ASP:N	2.73	0.52
1:E:138:ASN:HA	1:E:140:VAL:N	2.25	0.52
1:E:121:VAL:O	1:E:125:VAL:HG23	2.10	0.52
1:B:92:VAL:HG23	1:B:129:PHE:CZ	2.46	0.51
1:E:40:VAL:HA	1:E:76:LYS:HE2	1.92	0.51
1:D:47:GLU:HG3	1:D:77:LYS:HB3	1.93	0.51
1:B:210:THR:HG22	1:B:212:ALA:N	2.26	0.51
1:A:175:ALA:HB1	1:A:180:VAL:O	2.10	0.51
1:C:257:ARG:NH1	1:C:266:GLU:OE1	2.43	0.51
1:B:22:LYS:HE3	1:B:47:GLU:OE2	2.10	0.51
1:E:323:LYS:HZ2	1:E:323:LYS:HB3	1.75	0.51
1:B:290:PRO:O	1:B:302:LEU:HB2	2.11	0.51
1:B:178:VAL:HG12	1:B:180:VAL:HG23	1.93	0.51
1:F:321:LEU:O	1:F:321:LEU:HD22	2.11	0.51
1:B:188:TYR:CE2	1:B:290:PRO:HG3	2.45	0.51
1:A:67:ASN:OD1	1:B:169:ARG:HD3	2.10	0.51
1:D:148:TRP:HA	1:D:158:VAL:HG21	1.92	0.51
1:F:311:GLU:O	1:F:315:GLN:HG2	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:109:LEU:HA	1:A:112:LYS:HE2	1.91	0.51
1:E:19:ASP:H	1:F:295:ARG:HG3	1.76	0.51
1:D:274:VAL:HG13	1:D:298:ILE:CD1	2.37	0.50
1:C:188:TYR:CE2	1:C:290:PRO:HG3	2.45	0.50
1:F:172:GLN:O	1:F:176:GLU:HG3	2.11	0.50
1:D:289:THR:HG22	1:D:290:PRO:HD2	1.94	0.50
1:C:295:ARG:HD2	1:D:18:LYS:HE2	1.94	0.50
1:B:260:LYS:HG3	1:B:264:ASN:ND2	2.25	0.50
1:B:216:LYS:N	1:B:216:LYS:HD2	2.26	0.50
1:C:276:MET:HA	1:C:276:MET:CE	2.41	0.50
1:F:167:THR:O	1:F:171:ARG:HG3	2.12	0.50
1:A:130:ASN:HA	1:A:153:PHE:CZ	2.47	0.50
1:D:290:PRO:HG2	1:D:304:ILE:HD11	1.92	0.50
1:B:218:HIS:N	1:B:219:PRO:HD3	2.26	0.50
1:D:216:LYS:H	1:D:216:LYS:CD	2.21	0.50
1:E:285:ILE:HD12	1:E:321:LEU:HD12	1.93	0.50
1:B:177:MET:CE	1:B:225:LYS:HE3	2.42	0.50
1:A:53:ILE:HG13	3:A:383:HOH:O	2.12	0.50
1:C:111:ASN:OD1	1:C:111:ASN:N	2.43	0.50
1:C:311:GLU:O	1:C:315:GLN:HG2	2.12	0.49
1:A:210:THR:HG22	1:A:212:ALA:N	2.27	0.49
1:A:178:VAL:HG11	1:A:214:TRP:CZ2	2.47	0.49
1:B:44:ILE:O	1:B:45:ALA:HB3	2.13	0.49
1:D:188:TYR:CE2	1:D:290:PRO:HG3	2.47	0.49
1:F:218:HIS:N	1:F:219:PRO:HD3	2.28	0.49
1:F:140:VAL:HG13	1:F:141:ASP:N	2.27	0.49
1:C:327:ASP:O	1:C:328:ALA:HB2	2.13	0.49
1:D:79:TYR:CE2	1:D:81:ALA:HB2	2.48	0.49
1:C:210:THR:CG2	1:C:213:GLU:HG3	2.42	0.49
1:E:280:TYR:HE2	1:E:289:THR:HG21	1.77	0.49
1:B:137:ALA:O	1:B:140:VAL:HA	2.11	0.49
1:E:160:GLY:HA3	1:E:273:SER:OG	2.12	0.49
1:D:200:VAL:HG12	1:D:200:VAL:O	2.13	0.49
1:A:212:ALA:O	1:A:216:LYS:HD3	2.13	0.49
1:E:276:MET:CE	1:E:276:MET:HA	2.42	0.49
1:F:47:GLU:HG3	1:F:77:LYS:HB3	1.94	0.49
1:A:110:VAL:O	1:A:114:LEU:HG	2.12	0.49
1:C:18:LYS:HD3	1:D:295:ARG:HH11	1.78	0.48
1:F:177:MET:HE3	1:F:226:LEU:HD23	1.95	0.48
1:F:220:GLU:CD	1:F:220:GLU:H	2.16	0.48
1:F:44:ILE:O	1:F:45:ALA:HB3	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:146:ALA:O	1:D:150:LEU:HG	2.13	0.48
1:C:130:ASN:CG	1:C:130:ASN:O	2.51	0.48
1:C:140:VAL:HG13	1:C:141:ASP:N	2.27	0.48
1:A:140:VAL:HG13	1:A:141:ASP:N	2.28	0.48
1:D:275:TYR:CE2	1:D:284:ASP:HA	2.48	0.48
1:B:165:LEU:O	1:B:169:ARG:HG3	2.13	0.48
1:A:222:LYS:HB3	1:A:224:ASP:OD1	2.12	0.48
1:C:295:ARG:HH11	1:D:18:LYS:HE2	1.77	0.48
1:C:307:THR:HG23	1:C:309:HIS:N	2.28	0.48
1:C:323:LYS:HZ3	1:C:323:LYS:HB3	1.78	0.48
1:C:50:ILE:HG22	1:C:58:THR:HG22	1.95	0.48
1:C:251:ILE:HG13	1:C:255:LEU:HD22	1.96	0.48
1:E:52:ASP:HB3	1:E:58:THR:CG2	2.43	0.48
1:C:307:THR:HG22	1:C:310:GLU:CG	2.44	0.47
1:A:307:THR:HG22	1:A:310:GLU:CG	2.44	0.47
1:E:100:GLN:HB3	1:E:109:LEU:HD22	1.95	0.47
1:B:223:GLU:O	1:B:227:VAL:HG23	2.14	0.47
1:F:21:GLN:HA	1:F:90:ASP:OD2	2.14	0.47
1:C:240:ILE:HG21	1:C:247:THR:HG22	1.95	0.47
1:A:167:THR:HG23	1:A:187:ALA:O	2.15	0.47
1:E:257:ARG:NH1	1:E:266:GLU:OE1	2.46	0.47
1:C:326:THR:HG22	1:C:326:THR:O	2.14	0.47
1:C:276:MET:HA	1:C:276:MET:HE2	1.95	0.47
1:D:70:PRO:CG	1:F:168:ALA:HB1	2.44	0.47
1:C:276:MET:CG	1:C:282:LEU:HB2	2.24	0.47
1:D:110:VAL:O	1:D:114:LEU:HG	2.14	0.47
1:E:138:ASN:HD22	1:E:140:VAL:H	1.62	0.47
1:B:292:VAL:HB	1:B:300:ASN:H	1.79	0.47
1:D:178:VAL:O	1:D:178:VAL:HG12	2.15	0.47
1:B:289:THR:HG22	1:B:290:PRO:CD	2.44	0.47
1:B:289:THR:CG2	1:B:290:PRO:HD2	2.45	0.47
1:E:52:ASP:HB3	1:E:58:THR:HG21	1.97	0.47
1:A:307:THR:CG2	1:A:310:GLU:H	2.28	0.47
1:A:181:ASP:OD2	1:A:183:ARG:HD3	2.14	0.47
1:B:280:TYR:HE2	1:B:289:THR:HG21	1.80	0.47
1:A:149:LYS:HD3	1:A:329:PHE:CE2	2.49	0.47
1:E:170:PHE:CE2	1:E:187:ALA:HB1	2.50	0.47
1:D:210:THR:HB	1:D:213:GLU:CG	2.41	0.47
1:F:274:VAL:CG1	1:F:298:ILE:HD13	2.45	0.47
1:A:138:ASN:HA	1:A:140:VAL:N	2.30	0.47
1:C:44:ILE:O	1:C:45:ALA:HB3	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:287:ILE:HD13	1:A:314:MET:CE	2.44	0.46
1:D:37:TYR:CZ	1:D:41:LEU:HD11	2.49	0.46
1:D:215:VAL:HG13	1:D:216:LYS:N	2.30	0.46
1:C:307:THR:HG22	1:C:310:GLU:HG3	1.96	0.46
1:A:178:VAL:CG1	1:A:214:TRP:CZ2	2.98	0.46
1:E:17:ASP:N	1:E:17:ASP:OD2	2.47	0.46
1:A:118:LYS:HA	1:A:150:LEU:HD13	1.97	0.46
1:F:285:ILE:HD12	1:F:321:LEU:HD12	1.98	0.46
1:A:274:VAL:HG12	1:A:298:ILE:CD1	2.46	0.46
1:A:323:LYS:HZ3	1:A:323:LYS:HB3	1.81	0.46
1:A:106:ARG:HH22	1:A:142:ILE:HD11	1.79	0.46
1:C:177:MET:HE2	1:C:221:ILE:HG23	1.96	0.46
1:F:307:THR:CG2	1:F:308:ASP:N	2.78	0.46
1:E:178:VAL:HG13	1:E:214:TRP:CZ2	2.50	0.46
1:D:41:LEU:HA	1:D:72:THR:HG21	1.98	0.46
1:F:289:THR:CG2	1:F:290:PRO:HD2	2.46	0.46
1:D:274:VAL:HG12	1:D:275:TYR:N	2.31	0.46
1:C:295:ARG:CD	1:D:18:LYS:HB3	2.44	0.46
1:A:289:THR:OG1	1:A:290:PRO:HD2	2.16	0.46
1:D:221:ILE:HG23	1:D:222:LYS:N	2.30	0.46
1:E:178:VAL:CG1	1:E:178:VAL:O	2.64	0.46
1:B:266:GLU:O	1:B:267:ASN:HB2	2.16	0.46
1:B:177:MET:CE	1:B:225:LYS:HG2	2.46	0.45
1:B:160:GLY:HA3	1:B:273:SER:OG	2.16	0.45
1:F:289:THR:HG22	1:F:290:PRO:N	2.32	0.45
1:A:323:LYS:NZ	1:A:323:LYS:HB3	2.32	0.45
1:D:173:SER:OG	1:D:229:MET:HG3	2.16	0.45
1:B:320:GLN:O	1:B:324:VAL:HG23	2.16	0.45
1:D:274:VAL:HG22	1:D:298:ILE:HD13	1.99	0.45
1:D:307:THR:HG23	3:D:366:HOH:O	2.15	0.45
1:A:274:VAL:HG12	1:A:298:ILE:HD13	1.98	0.45
1:B:35:TYR:CD1	1:B:255:LEU:HB3	2.51	0.45
1:A:244:LYS:HE2	1:A:246:ALA:O	2.15	0.45
1:A:210:THR:HB	1:A:213:GLU:CD	2.37	0.45
1:F:130:ASN:CG	1:F:130:ASN:O	2.54	0.45
1:F:156:ASN:HB2	1:F:298:ILE:O	2.16	0.45
1:C:178:VAL:HG12	1:C:178:VAL:O	2.15	0.45
1:C:307:THR:HG23	1:C:309:HIS:H	1.80	0.45
1:B:61:ASP:CG	3:B:347:HOH:O	2.55	0.45
1:C:37:TYR:CZ	1:C:41:LEU:HD11	2.52	0.45
1:D:213:GLU:OE2	1:E:305:PRO:HG3	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:295:ARG:HG2	1:E:296:ASN:N	2.31	0.45
1:D:122:ASP:CB	1:D:123:PRO:HD3	2.45	0.45
1:B:92:VAL:HG23	1:B:129:PHE:CE1	2.51	0.45
1:F:101:LYS:HB3	1:F:102:PRO:HD2	1.99	0.45
1:C:111:ASN:OD1	1:C:112:LYS:N	2.50	0.45
1:E:44:ILE:O	1:E:45:ALA:HB3	2.17	0.45
1:C:148:TRP:HA	1:C:158:VAL:HG21	1.99	0.44
1:F:279:GLN:HA	1:F:303:GLU:OE1	2.18	0.44
1:F:138:ASN:CG	1:F:139:PRO:HA	2.38	0.44
1:B:145:TYR:CD1	1:B:325:LEU:HD11	2.52	0.44
1:A:44:ILE:O	1:A:45:ALA:HB3	2.17	0.44
1:E:307:THR:HG23	1:E:309:HIS:H	1.81	0.44
1:A:210:THR:CB	1:A:213:GLU:HG3	2.46	0.44
1:F:178:VAL:HG11	1:F:214:TRP:CZ2	2.53	0.44
1:A:292:VAL:HG23	1:A:302:LEU:HD21	1.99	0.44
1:C:175:ALA:O	1:C:179:ASN:N	2.50	0.44
1:C:213:GLU:CD	1:F:305:PRO:HG3	2.38	0.44
1:E:289:THR:HG22	1:E:290:PRO:CD	2.47	0.44
1:D:140:VAL:HG13	1:D:141:ASP:N	2.31	0.44
1:E:181:ASP:OD2	1:E:183:ARG:HD3	2.17	0.44
1:F:210:THR:HG22	1:F:211:ILE:N	2.33	0.44
1:B:178:VAL:CG1	1:B:178:VAL:O	2.65	0.44
1:A:178:VAL:HG12	1:A:180:VAL:HG23	2.00	0.44
1:D:52:ASP:HB3	1:D:58:THR:CG2	2.48	0.44
1:C:214:TRP:HZ3	1:F:302:LEU:CD1	2.31	0.44
1:C:92:VAL:HG11	1:C:124:ILE:HD13	1.98	0.44
1:A:70:PRO:HG3	1:B:168:ALA:HB1	2.00	0.44
1:E:22:LYS:HE3	1:E:47:GLU:OE2	2.17	0.44
1:E:325:LEU:HA	1:E:325:LEU:HD12	1.88	0.44
1:E:165:LEU:HD13	1:E:250:GLY:C	2.39	0.43
1:C:171:ARG:HD3	1:C:185:VAL:O	2.18	0.43
1:A:247:THR:HG23	3:A:343:HOH:O	2.18	0.43
1:C:199:PRO:HD3	1:C:230:PHE:CE1	2.53	0.43
1:E:290:PRO:HG2	1:E:304:ILE:HD11	2.00	0.43
1:E:275:TYR:CZ	1:E:284:ASP:HA	2.53	0.43
1:E:122:ASP:HB2	1:E:123:PRO:HD3	1.99	0.43
1:B:239:GLU:O	1:B:243:LEU:HG	2.18	0.43
1:D:266:GLU:O	1:D:267:ASN:HB2	2.18	0.43
1:C:119:SER:O	1:C:123:PRO:HG3	2.18	0.43
1:C:328:ALA:HB1	3:C:340:HOH:O	2.18	0.43
1:B:267:ASN:OD1	1:B:294:ASN:HB3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:92:VAL:HG23	1:A:129:PHE:CZ	2.53	0.43
1:E:167:THR:HG23	1:E:187:ALA:O	2.19	0.43
1:C:52:ASP:OD1	1:C:53:ILE:N	2.52	0.43
1:D:114:LEU:HD11	1:D:328:ALA:HB1	2.00	0.43
1:A:91:LEU:HD12	1:A:132:ILE:O	2.18	0.43
1:C:160:GLY:HA3	1:C:273:SER:OG	2.19	0.43
1:C:274:VAL:O	1:C:286:TYR:HA	2.19	0.43
1:C:110:VAL:HG12	1:C:114:LEU:CD1	2.49	0.43
1:D:265:ASP:CG	1:D:295:ARG:HE	2.21	0.43
1:E:52:ASP:OD1	1:E:53:ILE:N	2.52	0.43
1:A:139:PRO:O	1:A:143:LEU:HG	2.19	0.43
1:D:178:VAL:CG1	1:D:178:VAL:O	2.68	0.42
1:A:59:LYS:O	1:A:63:ILE:HG13	2.19	0.42
1:D:32:GLY:O	1:D:35:TYR:HB3	2.18	0.42
1:D:53:ILE:HG13	3:D:341:HOH:O	2.19	0.42
1:D:306:LEU:HB3	1:D:310:GLU:HB2	2.00	0.42
1:B:24:ILE:HG13	1:B:86:ALA:HA	2.01	0.42
1:A:56:ASP:O	1:B:243:LEU:HB3	2.19	0.42
1:D:260:LYS:HG3	1:D:264:ASN:ND2	2.34	0.42
1:A:19:ASP:HA	3:A:357:HOH:O	2.18	0.42
1:C:276:MET:O	1:C:283:ASN:HA	2.19	0.42
1:D:289:THR:CG2	1:D:290:PRO:HD2	2.49	0.42
1:A:210:THR:CG2	1:A:213:GLU:HG3	2.48	0.42
1:E:275:TYR:HD1	1:E:286:TYR:CE1	2.38	0.42
1:F:101:LYS:HE2	3:F:366:HOH:O	2.19	0.42
1:C:260:LYS:NZ	3:C:362:HOH:O	2.22	0.42
1:C:295:ARG:HE	1:C:295:ARG:HB3	1.72	0.42
1:E:190:MET:CE	1:E:289:THR:HG23	2.50	0.42
1:E:178:VAL:CG1	1:E:214:TRP:CZ2	3.02	0.42
1:F:86:ALA:O	1:F:129:PHE:HB2	2.20	0.42
1:B:52:ASP:HB3	1:B:58:THR:CG2	2.50	0.42
1:E:210:THR:HG22	1:E:211:ILE:N	2.34	0.42
1:D:107:LEU:HD11	1:D:328:ALA:HA	2.01	0.42
1:A:187:ALA:HA	3:A:346:HOH:O	2.18	0.42
1:A:307:THR:HG22	1:A:310:GLU:HG3	2.02	0.42
1:D:31:VAL:HG13	1:D:251:ILE:HG23	2.00	0.42
1:E:190:MET:HE1	1:E:289:THR:HG23	2.01	0.42
1:D:35:TYR:CD1	1:D:255:LEU:HB3	2.54	0.42
1:F:210:THR:HG22	1:F:212:ALA:N	2.34	0.42
1:B:190:MET:HB3	1:B:190:MET:HE2	1.90	0.42
1:A:165:LEU:O	1:A:169:ARG:HG3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:222:LYS:HB2	1:A:225:LYS:HG2	2.02	0.42
1:F:64:ASP:O	1:F:67:ASN:HB2	2.20	0.42
1:D:107:LEU:O	1:D:111:ASN:ND2	2.52	0.42
1:C:266:GLU:O	1:F:181:ASP:HB2	2.20	0.42
1:E:110:VAL:O	1:E:114:LEU:HG	2.19	0.42
1:D:163:THR:HG23	3:D:360:HOH:O	2.19	0.42
1:D:121:VAL:O	1:D:125:VAL:HG23	2.19	0.41
1:D:257:ARG:NH1	1:D:266:GLU:OE1	2.53	0.41
1:E:194:GLY:O	1:E:197:GLU:HG2	2.20	0.41
1:E:175:ALA:O	1:E:179:ASN:N	2.53	0.41
1:C:312:GLU:O	1:C:315:GLN:HB2	2.20	0.41
1:E:92:VAL:HG23	1:E:129:PHE:CZ	2.55	0.41
1:F:289:THR:HG23	1:F:290:PRO:HD2	2.01	0.41
1:F:210:THR:HB	1:F:213:GLU:CG	2.39	0.41
1:D:105:THR:HG22	1:D:107:LEU:N	2.24	0.41
1:F:105:THR:HG23	3:F:356:HOH:O	2.20	0.41
1:C:159:VAL:HG12	1:C:160:GLY:N	2.35	0.41
1:D:160:GLY:HA3	1:D:273:SER:OG	2.21	0.41
1:A:287:ILE:HD13	1:A:314:MET:HE3	2.02	0.41
1:D:241:ILE:HG23	1:D:245:GLY:O	2.21	0.41
1:F:223:GLU:O	1:F:227:VAL:HG23	2.20	0.41
1:B:200:VAL:HB	3:B:350:HOH:O	2.20	0.41
1:A:178:VAL:O	1:A:178:VAL:CG1	2.67	0.41
1:D:148:TRP:CD1	1:D:153:PHE:O	2.74	0.41
1:F:22:LYS:HE3	1:F:47:GLU:OE2	2.21	0.41
1:A:52:ASP:HB3	1:A:58:THR:CG2	2.51	0.41
1:C:275:TYR:CZ	1:C:284:ASP:HA	2.55	0.41
1:D:308:ASP:O	1:D:312:GLU:HG3	2.21	0.41
1:A:139:PRO:HG2	1:A:142:ILE:HB	2.03	0.41
1:A:188:TYR:CE2	1:A:271:PRO:HG3	2.56	0.41
1:D:292:VAL:HG21	1:D:300:ASN:HD22	1.85	0.41
1:E:165:LEU:O	1:E:169:ARG:HG3	2.20	0.41
1:D:106:ARG:HH21	1:D:106:ARG:CG	2.34	0.41
1:B:21:GLN:HB2	1:B:45:ALA:HA	2.03	0.41
1:A:66:SER:HA	1:A:69:LEU:HG	2.02	0.41
1:E:247:THR:HG23	3:E:374:HOH:O	2.19	0.41
1:D:209:VAL:CG2	1:E:304:ILE:HD13	2.51	0.40
1:A:307:THR:HG23	1:A:310:GLU:H	1.85	0.40
1:C:116:ILE:O	1:C:119:SER:OG	2.35	0.40
1:C:91:LEU:HD12	1:C:132:ILE:O	2.21	0.40
1:D:98:ALA:HA	1:D:99:PRO:HD3	1.95	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:298:ILE:HD12	3:D:374:HOH:O	2.21	0.40
1:D:255:LEU:HA	1:D:255:LEU:HD12	1.88	0.40
1:E:126:ASP:C	1:E:128:GLY:H	2.24	0.40
1:B:181:ASP:OD1	1:B:183:ARG:HD3	2.21	0.40
1:E:138:ASN:HA	1:E:139:PRO:C	2.41	0.40
1:F:218:HIS:HB3	1:F:220:GLU:OE2	2.22	0.40
1:A:146:ALA:O	1:A:150:LEU:HG	2.21	0.40
1:C:142:ILE:HG12	1:C:325:LEU:HD23	2.03	0.40
1:A:105:THR:HG22	1:A:107:LEU:N	2.31	0.40
1:B:260:LYS:HG3	1:B:264:ASN:HD22	1.85	0.40
1:F:140:VAL:HG13	1:F:141:ASP:H	1.86	0.40
1:C:32:GLY:O	1:C:35:TYR:HB3	2.21	0.40
1:B:37:TYR:CE2	1:B:41:LEU:HD11	2.56	0.40
1:C:181:ASP:HB2	1:F:266:GLU:O	2.22	0.40
1:D:177:MET:SD	1:D:229:MET:HE1	2.62	0.40
1:B:145:TYR:CD1	1:B:145:TYR:C	2.95	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	303/326 (93%)	288 (95%)	15 (5%)	0	100	100
1	B	311/326 (95%)	294 (94%)	16 (5%)	1 (0%)	46	68
1	C	293/326 (90%)	274 (94%)	18 (6%)	1 (0%)	46	68
1	D	303/326 (93%)	278 (92%)	22 (7%)	3 (1%)	19	34
1	E	310/326 (95%)	293 (94%)	16 (5%)	1 (0%)	46	68
1	F	311/326 (95%)	290 (93%)	21 (7%)	0	100	100
All	All	1831/1956 (94%)	1717 (94%)	108 (6%)	6 (0%)	46	68

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	327	ASP
1	B	217	ALA
1	D	96	ALA
1	E	96	ALA
1	D	221	ILE
1	D	139	PRO

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	253/269 (94%)	249 (98%)	4 (2%)	70	90
1	B	257/269 (96%)	248 (96%)	9 (4%)	43	70
1	C	246/269 (91%)	240 (98%)	6 (2%)	57	82
1	D	253/269 (94%)	245 (97%)	8 (3%)	46	74
1	E	257/269 (96%)	247 (96%)	10 (4%)	39	66
1	F	257/269 (96%)	248 (96%)	9 (4%)	43	70
All	All	1523/1614 (94%)	1477 (97%)	46 (3%)	48	76

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	255	LEU
1	A	257	ARG
1	A	302	LEU
1	A	325	LEU
1	B	106	ARG
1	B	210	THR
1	B	223	GLU
1	B	255	LEU
1	B	257	ARG
1	B	276	MET
1	B	295	ARG

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Mol	Chain	Res	Type
1	B	307	THR
1	B	325	LEU
1	C	122	ASP
1	C	210	THR
1	C	255	LEU
1	C	257	ARG
1	C	276	MET
1	C	295	ARG
1	D	17	ASP
1	D	122	ASP
1	D	255	LEU
1	D	257	ARG
1	D	276	MET
1	D	314	MET
1	D	321	LEU
1	D	325	LEU
1	E	19	ASP
1	E	56	ASP
1	E	101	LYS
1	E	195	ASP
1	E	255	LEU
1	E	257	ARG
1	E	276	MET
1	E	289	THR
1	E	307	THR
1	E	325	LEU
1	F	56	ASP
1	F	61	ASP
1	F	106	ARG
1	F	255	LEU
1	F	257	ARG
1	F	276	MET
1	F	295	ARG
1	F	321	LEU
1	F	325	LEU

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

Mol	Chain	Res	Type
1	A	138	ASN
1	B	100	GLN
1	B	111	ASN

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Mol	Chain	Res	Type
1	B	138	ASN
1	B	264	ASN
1	C	138	ASN
1	C	296	ASN
1	C	300	ASN
1	D	67	ASN
1	D	111	ASN
1	D	130	ASN
1	D	138	ASN
1	D	218	HIS
1	D	300	ASN
1	E	138	ASN
1	E	203	HIS
1	E	296	ASN
1	F	218	HIS

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](#)

12 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
2	SO4	A	2	-	4,4,4	0.29	0	6,6,6	0.13	0
2	SO4	A	7	-	4,4,4	0.17	0	6,6,6	0.18	0
2	SO4	B	1	-	4,4,4	0.25	0	6,6,6	0.13	0
2	SO4	B	8	-	4,4,4	0.14	0	6,6,6	0.15	0
2	SO4	C	3	-	4,4,4	0.21	0	6,6,6	0.08	0
2	SO4	C	9	-	4,4,4	0.14	0	6,6,6	0.09	0
2	SO4	D	11	-	4,4,4	0.18	0	6,6,6	0.07	0
2	SO4	D	5	-	4,4,4	0.27	0	6,6,6	0.23	0
2	SO4	E	10	-	4,4,4	0.19	0	6,6,6	0.11	0
2	SO4	E	4	-	4,4,4	0.28	0	6,6,6	0.09	0
2	SO4	F	339	-	4,4,4	0.15	0	6,6,6	0.26	0
2	SO4	F	6	-	4,4,4	0.29	0	6,6,6	0.11	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
2	SO4	A	2	-	-	0/0/0/0	0/0/0/0
2	SO4	A	7	-	-	0/0/0/0	0/0/0/0
2	SO4	B	1	-	-	0/0/0/0	0/0/0/0
2	SO4	B	8	-	-	0/0/0/0	0/0/0/0
2	SO4	C	3	-	-	0/0/0/0	0/0/0/0
2	SO4	C	9	-	-	0/0/0/0	0/0/0/0
2	SO4	D	11	-	-	0/0/0/0	0/0/0/0
2	SO4	D	5	-	-	0/0/0/0	0/0/0/0
2	SO4	E	10	-	-	0/0/0/0	0/0/0/0
2	SO4	E	4	-	-	0/0/0/0	0/0/0/0
2	SO4	F	339	-	-	0/0/0/0	0/0/0/0
2	SO4	F	6	-	-	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

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	307/326 (94%)	0.21	26 (8%)	13 14	24, 40, 71, 88	0
1	B	313/326 (96%)	-0.00	10 (3%)	51 56	23, 39, 63, 83	0
1	C	297/326 (91%)	-0.06	9 (3%)	54 59	22, 39, 69, 89	0
1	D	307/326 (94%)	0.39	27 (8%)	12 13	25, 43, 90, 109	0
1	E	312/326 (95%)	-0.05	11 (3%)	48 53	23, 37, 66, 91	0
1	F	313/326 (96%)	0.02	13 (4%)	40 45	24, 40, 63, 91	0
All	All	1849/1956 (94%)	0.09	96 (5%)	31 35	22, 40, 71, 109	0

All (96) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	219	PRO	8.3
1	D	221	ILE	6.7
1	D	326	THR	6.1
1	D	215	VAL	5.9
1	E	219	PRO	5.6
1	E	216	LYS	5.4
1	D	107	LEU	5.1
1	D	328	ALA	5.1
1	D	220	GLU	4.7
1	F	224	ASP	4.5
1	A	238	TYR	4.3
1	D	105	THR	4.2
1	D	327	ASP	4.2
1	D	108	ASP	4.2
1	D	222	LYS	4.0
1	B	224	ASP	4.0
1	F	330	ALA	3.8
1	A	108	ASP	3.8
1	E	222	LYS	3.7

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Mol	Chain	Res	Type	RSRZ
1	D	99	PRO	3.7
1	F	216	LYS	3.5
1	F	219	PRO	3.5
1	E	221	ILE	3.4
1	A	323	LYS	3.4
1	D	329	PHE	3.3
1	A	107	LEU	3.3
1	E	224	ASP	3.3
1	A	105	THR	3.3
1	D	323	LYS	3.1
1	D	272	LEU	3.0
1	D	238	TYR	3.0
1	A	272	LEU	3.0
1	D	212	ALA	3.0
1	C	308	ASP	3.0
1	C	111	ASN	2.9
1	B	219	PRO	2.9
1	A	135	VAL	2.8
1	D	218	HIS	2.8
1	A	162	GLY	2.8
1	B	216	LYS	2.8
1	B	330	ALA	2.7
1	A	160	GLY	2.7
1	F	107	LEU	2.6
1	C	238	TYR	2.6
1	A	326	THR	2.6
1	B	222	LYS	2.6
1	A	115	LYS	2.6
1	B	300	ASN	2.6
1	C	284	ASP	2.5
1	E	238	TYR	2.5
1	D	106	ARG	2.5
1	C	195	ASP	2.5
1	D	161	SER	2.5
1	D	271	PRO	2.4
1	F	272	LEU	2.4
1	D	312	GLU	2.4
1	F	162	GLY	2.4
1	F	309	HIS	2.4
1	E	223	GLU	2.4
1	E	115	LYS	2.4
1	A	270	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	328	ALA	2.3
1	D	224	ASP	2.3
1	E	54	PHE	2.3
1	E	309	HIS	2.3
1	A	159	VAL	2.3
1	A	161	SER	2.2
1	F	161	SER	2.2
1	F	329	PHE	2.2
1	A	127	SER	2.2
1	A	273	SER	2.2
1	D	216	LYS	2.2
1	B	307	THR	2.2
1	F	222	LYS	2.2
1	A	288	GLY	2.2
1	C	272	LEU	2.2
1	A	140	VAL	2.2
1	C	309	HIS	2.2
1	B	329	PHE	2.2
1	A	325	LEU	2.2
1	A	111	ASN	2.2
1	D	214	TRP	2.1
1	C	281	GLY	2.1
1	E	227	VAL	2.1
1	F	312	GLU	2.1
1	B	159	VAL	2.1
1	A	308	ASP	2.1
1	D	225	LYS	2.1
1	F	328	ALA	2.1
1	A	134	LEU	2.1
1	A	271	PRO	2.1
1	A	315	GLN	2.0
1	A	328	ALA	2.0
1	D	217	ALA	2.0
1	A	144	THR	2.0
1	B	273	SER	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 [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	SO4	F	339	5/5	0.99	0.15	-0.48	33,35,39,41	0
2	SO4	B	1	5/5	0.97	0.14	-0.74	38,47,55,61	0
2	SO4	B	8	5/5	0.98	0.14	-0.82	34,39,43,43	0
2	SO4	F	6	5/5	0.98	0.11	-1.30	43,46,61,62	0
2	SO4	D	5	5/5	0.96	0.12	-1.30	43,44,60,68	0
2	SO4	C	9	5/5	0.99	0.14	-1.41	31,36,41,45	0
2	SO4	A	7	5/5	0.99	0.12	-1.42	33,35,43,44	0
2	SO4	E	4	5/5	0.98	0.09	-1.44	36,37,52,54	0
2	SO4	C	3	5/5	0.97	0.10	-1.44	50,52,63,63	0
2	SO4	E	10	5/5	0.98	0.14	-1.49	39,46,49,54	0
2	SO4	A	2	5/5	0.97	0.12	-1.50	42,48,56,59	0
2	SO4	D	11	5/5	0.99	0.14	-2.61	33,37,39,45	0

6.5 Other polymers [i](#)

There are no such residues in this entry.