Full wwPDB X-ray Structure Validation Report ⓘ

Nov 12, 2024 – 02:28 PM EST

PDB ID	:	3P5B
Title	:	The structure of the LDLR/PCSK9 complex reveals the receptor in an extended conformation
Authors	:	Lo Surdo, P.; Bottomley, M.J.; Calzetta, A.; Settembre, E.C.; Cirillo, A.; Pandit, S.; Ni, Y.; Hubbard, B.; Sitlani, A.; Carfi, A.
Deposited on	:	2010-10-08
Resolution	:	3.30 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

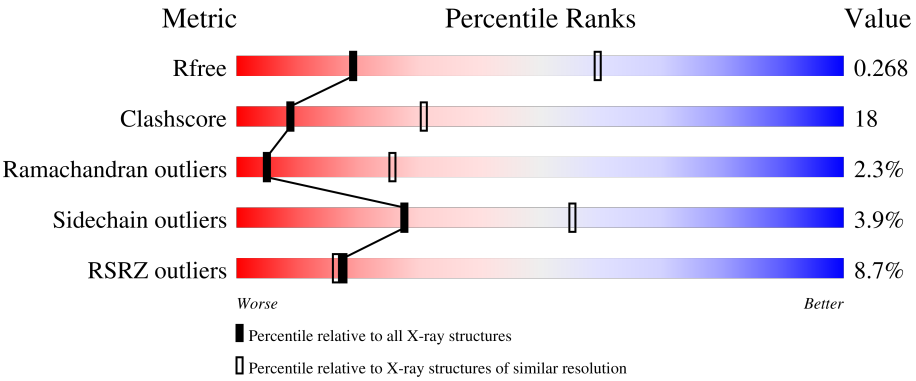
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.30 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	1085 (3.32-3.28)
Clashscore	180529	1128 (3.32-3.28)
Ramachandran outliers	177936	1125 (3.32-3.28)
Sidechain outliers	177891	1124 (3.32-3.28)
RSRZ outliers	164620	1085 (3.32-3.28)

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	P	92	4% 92% 7% ·
2	A	540	11% 74% 15% · 9%
3	L	400	5% 70% 23% · · ·

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 7464 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 Proprotein convertase subtilisin/kexin type 9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	P	92	Total	C	N	O	S	0	0	0
			740	474	133	131	2			

- Molecule 2 is a protein called Proprotein convertase subtilisin/kexin type 9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	493	Total	C	N	O	S	0	0	0
			3637	2243	668	694	32			

- Molecule 3 is a protein called Low density lipoprotein receptor variant.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	L	394	Total	C	N	O	S	0	0	0
			3084	1931	535	593	25			

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

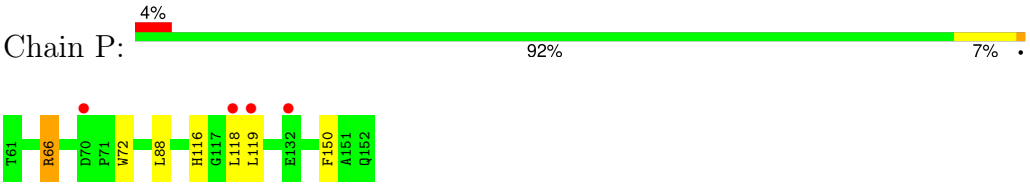
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Ca	0	0
			1	1		
4	L	2	Total	Ca	0	0
			2	2		

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.

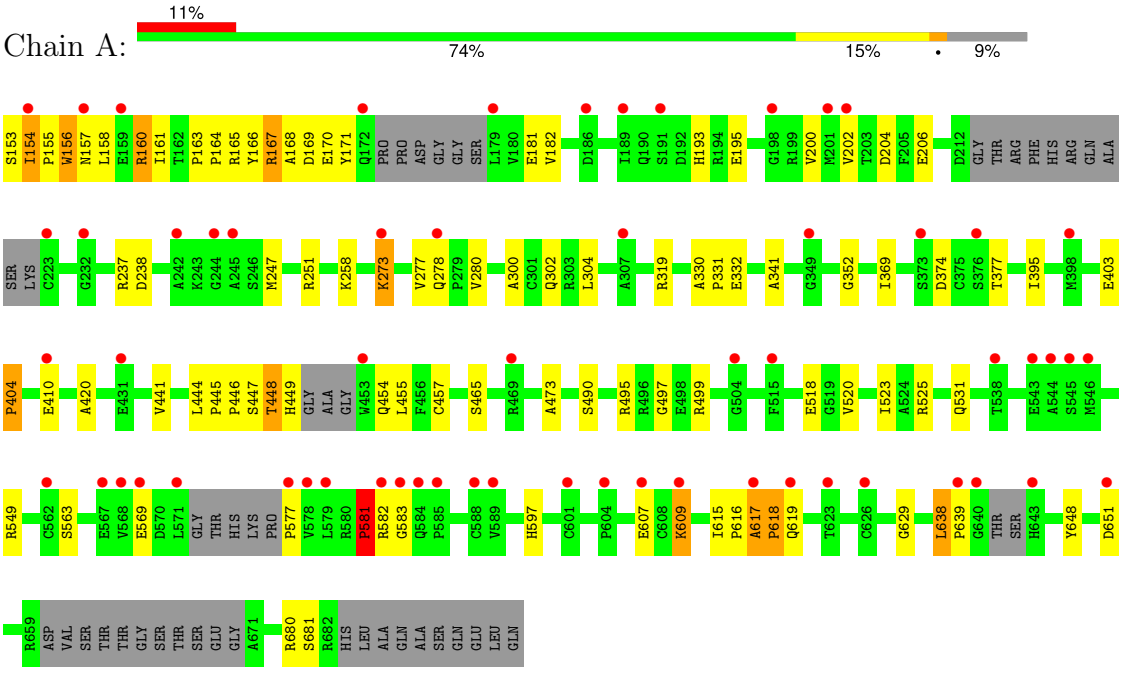
• Molecule 1: Proprotein convertase subtilisin/kexin type 9

Chain P:



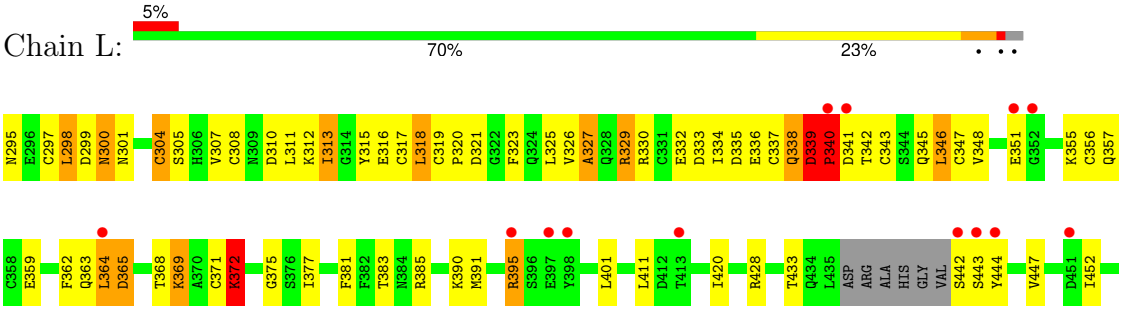
• Molecule 2: Proprotein convertase subtilisin/kexin type 9

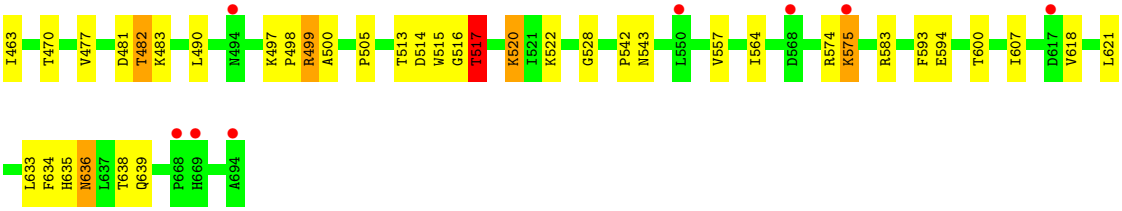
Chain A:



• Molecule 3: Low density lipoprotein receptor variant

Chain L:




I463
T470
V477
D481
T482
K483
L490
N494
K497
P498
R499
A500
P505
T513
D514
W515
G516
T517
K520
I521
K522
G528
P542
N543
L550
V557
I564
D568
R574
K575
R583
F593
E594
T600
I607
D617
V618
L621
L633
F634
H635
N636
L637
T638
Q639
P668
H669
A694

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	77.00Å 109.70Å 178.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.30 50.00 – 3.30	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-3.30) 98.2 (50.00-3.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.08 (at 3.33Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.271 , 0.298 0.274 , 0.268	Depositor DCC
R_{free} test set	1158 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	66.3	Xtriage
Anisotropy	0.254	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 35.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.44$, $< L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.85	EDS
Total number of atoms	7464	wwPDB-VP
Average B, all atoms (Å^2)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.93% 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: CA

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	P	0.31	0/757	0.46	0/1023
2	A	0.31	0/3702	0.47	2/5030 (0.0%)
3	L	0.44	0/3149	0.66	4/4279 (0.1%)
All	All	0.37	0/7608	0.56	6/10332 (0.1%)

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
3	L	0	1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	L	517	THR	C-N-CD	13.73	157.24	128.40
3	L	517	THR	C-N-CA	-10.60	77.48	122.00
3	L	517	THR	CA-C-N	7.04	136.82	117.10
2	A	581	PRO	N-CA-CB	5.68	110.12	103.30
3	L	339	ASP	N-CA-C	5.24	125.16	111.00
2	A	577	PRO	N-CA-CB	5.08	109.39	103.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	L	517	THR	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	P	740	0	750	7	0
2	A	3637	0	3512	78	3
3	L	3084	0	2990	191	0
4	A	1	0	0	0	0
4	L	2	0	0	0	0
All	All	7464	0	7252	269	3

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 18.

All (269) 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:A:447:SER:OG	2:A:449:HIS:HD2	1.23	1.20
3:L:339:ASP:HB3	3:L:340:PRO:HD2	1.19	1.14
3:L:299:ASP:O	3:L:300:ASN:ND2	1.81	1.14
3:L:339:ASP:HB3	3:L:340:PRO:CD	1.76	1.14
2:A:447:SER:OG	2:A:449:HIS:CD2	2.01	1.12
3:L:514:ASP:OD2	3:L:520:LYS:HE2	1.49	1.10
3:L:342:THR:HG22	3:L:343:CYS:H	1.21	1.06
3:L:395:ARG:NH2	3:L:395:ARG:HB2	1.72	1.04
3:L:339:ASP:CB	3:L:340:PRO:HD2	1.88	1.03
2:A:448:THR:HG22	2:A:448:THR:O	1.55	1.03
3:L:339:ASP:HA	3:L:342:THR:HB	1.42	0.99
3:L:304:CYS:HA	3:L:329:ARG:HG3	1.48	0.96
3:L:513:THR:HG21	3:L:542:PRO:O	1.65	0.95
2:A:167:ARG:HH11	2:A:167:ARG:HB3	1.29	0.95
3:L:311:LEU:HD21	3:L:316:GLU:HG2	1.50	0.93
3:L:326:VAL:HG21	3:L:332:GLU:HB2	1.55	0.87
2:A:455:LEU:H	2:A:680:ARG:NH2	1.72	0.87
3:L:365:ASP:HB2	3:L:372:LYS:HD3	1.56	0.86
3:L:395:ARG:HB2	3:L:395:ARG:HH21	1.36	0.86
3:L:342:THR:HG22	3:L:343:CYS:N	1.90	0.86
3:L:498:PRO:HA	3:L:513:THR:O	1.77	0.85
3:L:300:ASN:ND2	3:L:300:ASN:O	2.09	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:311:LEU:HD23	3:L:315:TYR:HA	1.59	0.84
3:L:326:VAL:HG21	3:L:332:GLU:CB	2.08	0.84
3:L:395:ARG:CZ	3:L:621:LEU:HB3	2.08	0.83
3:L:513:THR:HG23	3:L:542:PRO:HG2	1.60	0.82
3:L:395:ARG:HD2	3:L:621:LEU:O	1.79	0.82
3:L:395:ARG:NH2	3:L:395:ARG:CB	2.43	0.81
3:L:513:THR:CG2	3:L:542:PRO:HG2	2.11	0.81
3:L:338:GLN:OE1	3:L:338:GLN:HA	1.81	0.80
3:L:481:ASP:O	3:L:482:THR:C	2.19	0.80
3:L:395:ARG:CZ	3:L:395:ARG:HA	2.11	0.80
3:L:300:ASN:C	3:L:300:ASN:HD22	1.82	0.80
3:L:395:ARG:HA	3:L:395:ARG:NE	1.97	0.79
3:L:329:ARG:HA	3:L:329:ARG:NE	1.97	0.79
3:L:514:ASP:C	3:L:516:GLY:H	1.84	0.78
3:L:365:ASP:CB	3:L:372:LYS:HD3	2.12	0.78
3:L:342:THR:CG2	3:L:343:CYS:H	1.97	0.78
2:A:448:THR:O	2:A:448:THR:CG2	2.29	0.78
2:A:455:LEU:H	2:A:680:ARG:HH22	1.30	0.77
3:L:295:ASN:HD21	3:L:297:CYS:HB2	1.48	0.77
2:A:156:TRP:CZ3	2:A:341:ALA:HA	2.21	0.76
3:L:395:ARG:NH1	3:L:621:LEU:HB3	2.01	0.76
3:L:481:ASP:O	3:L:483:LYS:N	2.18	0.75
3:L:482:THR:HG23	3:L:483:LYS:N	2.01	0.75
3:L:481:ASP:O	3:L:481:ASP:OD1	2.05	0.75
3:L:371:CYS:O	3:L:372:LYS:O	2.05	0.75
3:L:381:PHE:CE2	3:L:401:LEU:HD22	2.22	0.75
3:L:513:THR:CG2	3:L:542:PRO:O	2.35	0.75
2:A:680:ARG:HE	2:A:681:SER:H	1.33	0.74
3:L:334:ILE:N	3:L:334:ILE:HD12	2.02	0.74
2:A:181:GLU:OE2	2:A:280:VAL:HG11	1.88	0.73
3:L:359:GLU:HB2	3:L:362:PHE:HD2	1.53	0.73
2:A:447:SER:HG	2:A:449:HIS:CD2	2.06	0.73
3:L:319:CYS:HB3	3:L:323:PHE:HB2	1.70	0.73
3:L:381:PHE:CD2	3:L:401:LEU:HD22	2.25	0.72
2:A:618:PRO:HB2	2:A:619:GLN:HA	1.70	0.72
3:L:369:LYS:HG3	3:L:369:LYS:O	1.91	0.71
2:A:153:SER:C	2:A:155:PRO:HD3	2.11	0.71
3:L:391:MET:SD	3:L:395:ARG:NH1	2.64	0.70
2:A:609:LYS:HE3	2:A:609:LYS:HA	1.74	0.69
3:L:575:LYS:NZ	3:L:575:LYS:HA	2.08	0.69
2:A:273:LYS:HE2	2:A:273:LYS:HA	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:334:ILE:HD12	3:L:334:ILE:H	1.54	0.69
3:L:348:VAL:HG13	3:L:355:LYS:HB3	1.75	0.68
3:L:447:VAL:HG13	3:L:482:THR:O	1.93	0.68
3:L:295:ASN:ND2	3:L:297:CYS:H	1.92	0.68
3:L:329:ARG:HA	3:L:329:ARG:HE	1.58	0.68
2:A:377:THR:HB	3:L:310:ASP:HB3	1.75	0.67
3:L:482:THR:CG2	3:L:483:LYS:N	2.57	0.67
3:L:395:ARG:NH2	3:L:621:LEU:HA	2.09	0.67
3:L:513:THR:HG23	3:L:542:PRO:CG	2.25	0.67
2:A:618:PRO:HB2	2:A:619:GLN:CA	2.24	0.67
3:L:326:VAL:CG1	3:L:330:ARG:HH21	2.08	0.67
3:L:339:ASP:O	3:L:341:ASP:N	2.28	0.67
3:L:433:THR:HG1	3:L:442:SER:N	1.93	0.67
2:A:629:GLY:O	2:A:680:ARG:HD2	1.94	0.67
3:L:514:ASP:O	3:L:516:GLY:N	2.26	0.66
3:L:395:ARG:NH2	3:L:621:LEU:CA	2.58	0.66
3:L:593:PHE:CD1	3:L:633:LEU:HD21	2.30	0.66
3:L:326:VAL:HG12	3:L:330:ARG:HH21	1.61	0.66
2:A:374:ASP:OD2	3:L:307:VAL:HG21	1.96	0.66
2:A:454:GLN:HG3	2:A:680:ARG:HH12	1.61	0.65
3:L:463:ILE:HD12	3:L:505:PRO:HB2	1.78	0.65
3:L:395:ARG:HH21	3:L:395:ARG:CB	2.04	0.65
3:L:395:ARG:HH22	3:L:621:LEU:CD2	2.10	0.65
3:L:395:ARG:CZ	3:L:395:ARG:CA	2.75	0.64
3:L:304:CYS:HA	3:L:329:ARG:CG	2.26	0.64
3:L:301:ASN:HB3	3:L:304:CYS:HB2	1.80	0.64
3:L:395:ARG:HH12	3:L:621:LEU:HD22	1.62	0.64
3:L:339:ASP:CA	3:L:342:THR:HB	2.23	0.63
3:L:365:ASP:HB2	3:L:372:LYS:HZ3	1.63	0.63
2:A:618:PRO:CB	2:A:619:GLN:HA	2.28	0.62
2:A:167:ARG:HB3	2:A:167:ARG:NH1	2.08	0.62
3:L:359:GLU:HB2	3:L:362:PHE:CD2	2.34	0.62
3:L:364:LEU:HD23	3:L:364:LEU:H	1.62	0.62
2:A:680:ARG:HE	2:A:681:SER:N	1.97	0.62
3:L:317:CYS:HB3	3:L:329:ARG:NE	2.15	0.62
3:L:395:ARG:NH2	3:L:621:LEU:HB3	2.14	0.61
3:L:365:ASP:HB2	3:L:372:LYS:CD	2.31	0.61
1:P:66:ARG:HH11	1:P:66:ARG:HG2	1.65	0.60
2:A:523:ILE:HD13	2:A:648:TYR:HB3	1.83	0.60
3:L:317:CYS:SG	3:L:329:ARG:HG2	2.42	0.60
3:L:326:VAL:HG11	3:L:330:ARG:NH2	2.16	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:326:VAL:CG2	3:L:332:GLU:HB3	2.32	0.60
3:L:593:PHE:HB2	3:L:633:LEU:CD2	2.33	0.59
3:L:348:VAL:CG1	3:L:355:LYS:HB3	2.33	0.59
3:L:364:LEU:HD23	3:L:364:LEU:N	2.18	0.59
3:L:326:VAL:O	3:L:327:ALA:HB3	2.02	0.58
2:A:154:ILE:HG12	2:A:154:ILE:O	2.03	0.58
3:L:325:LEU:CD1	3:L:329:ARG:HH11	2.17	0.58
3:L:395:ARG:NH2	3:L:621:LEU:CB	2.67	0.58
3:L:575:LYS:HA	3:L:575:LYS:HZ3	1.67	0.58
3:L:318:LEU:N	3:L:318:LEU:HD23	2.19	0.57
3:L:326:VAL:CG2	3:L:332:GLU:CB	2.80	0.57
3:L:326:VAL:HG21	3:L:332:GLU:HB3	1.87	0.57
3:L:375:GLY:O	3:L:635:HIS:ND1	2.38	0.57
3:L:329:ARG:HD3	3:L:330:ARG:H	1.70	0.57
3:L:395:ARG:CD	3:L:621:LEU:O	2.50	0.57
2:A:420:ALA:HB3	2:A:441:VAL:HB	1.87	0.57
3:L:327:ALA:C	3:L:329:ARG:H	2.09	0.57
3:L:514:ASP:C	3:L:516:GLY:N	2.53	0.56
3:L:557:VAL:HG12	3:L:564:ILE:HG12	1.87	0.56
3:L:334:ILE:H	3:L:334:ILE:CD1	2.19	0.56
2:A:457:CYS:HB3	2:A:525:ARG:HE	1.70	0.56
2:A:167:ARG:HH11	2:A:167:ARG:CB	2.11	0.56
3:L:320:PRO:HD2	3:L:323:PHE:CD2	2.41	0.55
3:L:351:GLU:H	3:L:351:GLU:CD	2.10	0.55
2:A:454:GLN:CG	2:A:680:ARG:HH12	2.20	0.55
3:L:326:VAL:CG1	3:L:330:ARG:NH2	2.69	0.54
3:L:317:CYS:C	3:L:318:LEU:HD23	2.27	0.54
3:L:348:VAL:HG12	3:L:355:LYS:O	2.07	0.54
3:L:329:ARG:O	3:L:330:ARG:HB3	2.07	0.54
3:L:513:THR:CG2	3:L:542:PRO:HB2	2.37	0.54
2:A:273:LYS:O	2:A:277:VAL:HG23	2.07	0.54
3:L:317:CYS:HB3	3:L:329:ARG:CZ	2.38	0.54
3:L:355:LYS:HD3	3:L:356:CYS:N	2.23	0.54
3:L:514:ASP:OD2	3:L:520:LYS:CE	2.40	0.54
3:L:334:ILE:N	3:L:334:ILE:CD1	2.71	0.53
3:L:312:LYS:HE2	3:L:312:LYS:HA	1.90	0.53
3:L:395:ARG:CZ	3:L:395:ARG:CB	2.86	0.53
3:L:395:ARG:HH22	3:L:621:LEU:HD23	1.73	0.53
3:L:428:ARG:HD2	3:L:452:ILE:O	2.08	0.53
3:L:317:CYS:CB	3:L:329:ARG:NE	2.72	0.53
3:L:297:CYS:C	3:L:299:ASP:H	2.11	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:297:CYS:O	3:L:299:ASP:N	2.43	0.52
3:L:339:ASP:CB	3:L:340:PRO:CD	2.59	0.52
2:A:157:ASN:O	2:A:161:ILE:HG23	2.10	0.52
3:L:574:ARG:O	3:L:575:LYS:HE2	2.09	0.52
2:A:499:ARG:HG2	2:A:597:HIS:CE1	2.45	0.52
2:A:182:VAL:HB	2:A:247:MET:HG2	1.91	0.52
2:A:454:GLN:HG2	2:A:680:ARG:HH22	1.73	0.52
3:L:593:PHE:HB2	3:L:633:LEU:HD21	1.91	0.52
1:P:88:LEU:HD13	1:P:116:HIS:HB3	1.91	0.51
2:A:166:TYR:HE1	2:A:171:TYR:HE2	1.57	0.51
2:A:277:VAL:HB	2:A:278:GLN:NE2	2.25	0.51
3:L:520:LYS:HE3	3:L:522:LYS:HE3	1.92	0.51
3:L:636:ASN:ND2	3:L:639:GLN:O	2.44	0.51
3:L:600:THR:HG22	3:L:607:ILE:HG12	1.92	0.51
2:A:171:TYR:OH	2:A:445:PRO:O	2.28	0.50
3:L:347:CYS:SG	3:L:348:VAL:N	2.85	0.50
3:L:372:LYS:NZ	3:L:377:ILE:HD13	2.27	0.50
3:L:482:THR:CG2	3:L:483:LYS:H	2.24	0.50
2:A:454:GLN:HG3	2:A:680:ARG:NH1	2.27	0.50
3:L:304:CYS:SG	3:L:308:CYS:HB2	2.51	0.50
2:A:167:ARG:O	2:A:170:GLU:N	2.45	0.50
3:L:383:THR:HG23	3:L:411:LEU:HD22	1.94	0.50
3:L:365:ASP:OD2	3:L:368:THR:N	2.45	0.49
2:A:160:ARG:HH22	2:A:420:ALA:CB	2.25	0.49
3:L:364:LEU:C	3:L:372:LYS:HZ1	2.15	0.49
3:L:313:ILE:N	3:L:313:ILE:HD13	2.27	0.49
3:L:497:LYS:O	3:L:514:ASP:HA	2.11	0.49
2:A:531:GLN:HE21	2:A:531:GLN:HA	1.77	0.49
3:L:346:LEU:CD2	3:L:357:GLN:HB2	2.42	0.49
3:L:372:LYS:HZ3	3:L:377:ILE:HD13	1.77	0.49
2:A:193:HIS:HD2	2:A:195:GLU:H	1.60	0.48
2:A:369:ILE:CD1	3:L:298:LEU:HD23	2.44	0.48
3:L:313:ILE:HG12	3:L:313:ILE:O	2.13	0.48
2:A:158:LEU:O	2:A:161:ILE:HG12	2.14	0.48
2:A:163:PRO:HD3	2:A:444:LEU:HB2	1.94	0.48
3:L:325:LEU:HD12	3:L:329:ARG:HH11	1.78	0.48
3:L:391:MET:SD	3:L:395:ARG:NE	2.86	0.48
3:L:513:THR:HG23	3:L:542:PRO:HB2	1.96	0.48
2:A:165:ARG:O	2:A:165:ARG:HG3	2.13	0.47
3:L:365:ASP:CB	3:L:372:LYS:HZ3	2.25	0.47
3:L:369:LYS:HE3	3:L:369:LYS:HA	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:499:ARG:HE	3:L:543:ASN:HD22	1.61	0.47
3:L:513:THR:HG21	3:L:542:PRO:C	2.33	0.47
3:L:317:CYS:SG	3:L:329:ARG:CG	3.03	0.47
3:L:355:LYS:HE3	3:L:357:GLN:HG2	1.95	0.47
2:A:202:VAL:HG12	2:A:204:ASP:H	1.80	0.47
2:A:490:SER:HB3	2:A:520:VAL:HG12	1.97	0.47
3:L:340:PRO:C	3:L:342:THR:H	2.18	0.47
3:L:355:LYS:HD3	3:L:355:LYS:C	2.35	0.47
3:L:636:ASN:O	3:L:639:GLN:N	2.48	0.47
2:A:319:ARG:HB2	2:A:352:GLY:H	1.80	0.46
2:A:156:TRP:CE3	2:A:341:ALA:HA	2.51	0.46
3:L:295:ASN:HD21	3:L:297:CYS:CB	2.20	0.46
3:L:359:GLU:CD	3:L:359:GLU:H	2.17	0.46
3:L:326:VAL:O	3:L:327:ALA:CB	2.64	0.46
3:L:346:LEU:HD23	3:L:357:GLN:C	2.35	0.46
3:L:583:ARG:HD3	3:L:618:VAL:HG11	1.97	0.46
2:A:206:GLU:HG3	2:A:251:ARG:HD3	1.98	0.46
3:L:513:THR:CG2	3:L:542:PRO:CG	2.86	0.45
3:L:395:ARG:HH21	3:L:395:ARG:CG	2.28	0.45
3:L:443:SER:HB2	3:L:444:TYR:CA	2.46	0.45
2:A:160:ARG:HH22	2:A:420:ALA:HB2	1.81	0.45
3:L:318:LEU:C	3:L:329:ARG:HH12	2.18	0.45
3:L:470:THR:HG22	3:L:477:VAL:HG22	1.98	0.45
2:A:563:SER:HB2	2:A:597:HIS:HB2	1.99	0.45
2:A:531:GLN:HA	2:A:531:GLN:NE2	2.32	0.45
1:P:119:LEU:HD11	2:A:300:ALA:HB2	1.99	0.44
3:L:371:CYS:O	3:L:372:LYS:HE3	2.18	0.44
1:P:72:TRP:CD1	1:P:150:PHE:HE2	2.35	0.44
1:P:66:ARG:HH11	1:P:66:ARG:CG	2.28	0.44
3:L:346:LEU:HB3	3:L:357:GLN:O	2.18	0.44
3:L:513:THR:HG23	3:L:542:PRO:CB	2.47	0.44
3:L:636:ASN:HD22	3:L:636:ASN:HA	1.56	0.44
2:A:618:PRO:HD2	2:A:619:GLN:HG3	2.00	0.44
3:L:391:MET:CE	3:L:395:ARG:HH11	2.30	0.44
2:A:395:ILE:HG23	2:A:444:LEU:HD23	1.99	0.44
3:L:395:ARG:NE	3:L:395:ARG:CA	2.74	0.43
2:A:154:ILE:N	2:A:155:PRO:HD3	2.33	0.43
2:A:615:ILE:HA	2:A:616:PRO:HD3	1.91	0.43
2:A:617:ALA:HA	2:A:618:PRO:HA	1.89	0.43
3:L:304:CYS:HB3	3:L:305:SER:H	1.70	0.43
3:L:513:THR:CG2	3:L:542:PRO:CB	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:167:ARG:O	2:A:168:ALA:C	2.56	0.43
2:A:273:LYS:HZ3	2:A:277:VAL:HG23	1.84	0.43
3:L:295:ASN:ND2	3:L:297:CYS:N	2.63	0.43
2:A:581:PRO:HA	2:A:582:ARG:HA	1.85	0.43
2:A:154:ILE:O	2:A:156:TRP:N	2.52	0.43
2:A:495:ARG:HG2	2:A:497:GLY:H	1.84	0.43
3:L:342:THR:CG2	3:L:343:CYS:N	2.60	0.43
2:A:638:LEU:HA	2:A:639:PRO:HD3	1.92	0.43
1:P:118:LEU:HD21	2:A:304:LEU:HD13	2.00	0.42
1:P:150:PHE:CE1	2:A:258:LYS:HG3	2.55	0.42
3:L:297:CYS:C	3:L:299:ASP:N	2.71	0.42
3:L:327:ALA:C	3:L:329:ARG:N	2.72	0.42
3:L:443:SER:HB2	3:L:444:TYR:C	2.40	0.42
2:A:330:ALA:HA	2:A:331:PRO:HD3	1.86	0.42
3:L:593:PHE:HB2	3:L:633:LEU:HD22	2.01	0.42
3:L:513:THR:HG21	3:L:542:PRO:HB2	2.00	0.42
3:L:633:LEU:HD23	3:L:638:THR:CG2	2.49	0.42
2:A:302:GLN:HA	2:A:332:GLU:HG3	2.01	0.42
3:L:635:HIS:O	3:L:638:THR:OG1	2.38	0.42
2:A:238:ASP:HB3	3:L:298:LEU:HD11	2.02	0.42
3:L:390:LYS:HB2	3:L:401:LEU:HB2	2.01	0.42
3:L:371:CYS:C	3:L:372:LYS:CE	2.88	0.42
3:L:499:ARG:HB3	3:L:500:ALA:H	1.67	0.42
2:A:165:ARG:HG2	2:A:165:ARG:HH21	1.86	0.41
3:L:490:LEU:HB3	3:L:528:GLY:HA3	2.01	0.41
3:L:364:LEU:H	3:L:364:LEU:CD2	2.28	0.41
2:A:445:PRO:HA	2:A:446:PRO:HD3	1.85	0.41
3:L:339:ASP:C	3:L:342:THR:HB	2.41	0.41
2:A:444:LEU:HA	2:A:445:PRO:HD3	1.90	0.41
3:L:327:ALA:O	3:L:329:ARG:N	2.54	0.41
3:L:381:PHE:HE1	3:L:634:PHE:CB	2.33	0.41
3:L:365:ASP:CG	3:L:368:THR:H	2.24	0.41
3:L:371:CYS:C	3:L:372:LYS:HE2	2.41	0.41
2:A:160:ARG:NH2	2:A:420:ALA:HB2	2.36	0.40
2:A:200:VAL:HG22	2:A:247:MET:HB2	2.01	0.40
2:A:465:SER:HB3	2:A:473:ALA:HB2	2.03	0.40
3:L:391:MET:CE	3:L:395:ARG:NH1	2.85	0.40
3:L:443:SER:HB2	3:L:444:TYR:HA	2.03	0.40
3:L:345:GLN:HB3	3:L:359:GLU:OE2	2.20	0.40
3:L:411:LEU:HD12	3:L:420:ILE:HD11	2.03	0.40
2:A:403:GLU:HA	2:A:404:PRO:HD3	1.94	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:339:ASP:O	3:L:342:THR:N	2.54	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:237:ARG:CZ	2:A:569:GLU:OE1[3_644]	1.85	0.35
2:A:237:ARG:NH1	2:A:569:GLU:OE1[3_644]	1.96	0.24
2:A:237:ARG:NH2	2:A:569:GLU:CD[3_644]	2.09	0.11

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	P	90/92 (98%)	86 (96%)	4 (4%)	0	100 100
2	A	479/540 (89%)	437 (91%)	34 (7%)	8 (2%)	7 31
3	L	390/400 (98%)	327 (84%)	49 (13%)	14 (4%)	3 18
All	All	959/1032 (93%)	850 (89%)	87 (9%)	22 (2%)	5 26

All (22) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	448	THR
2	A	581	PRO
2	A	618	PRO
3	L	327	ALA
3	L	339	ASP
3	L	340	PRO
3	L	346	LEU
3	L	369	LYS
3	L	372	LYS

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Mol	Chain	Res	Type
3	L	482	THR
3	L	298	LEU
3	L	304	CYS
3	L	515	TRP
2	A	154	ILE
2	A	617	ALA
2	A	651	ASP
3	L	336	GLU
3	L	321	ASP
3	L	385	ARG
3	L	594	GLU
2	A	156	TRP
2	A	583	GLY

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	P	79/79 (100%)	78 (99%)	1 (1%)	65 79
2	A	386/430 (90%)	374 (97%)	12 (3%)	35 61
3	L	347/352 (99%)	328 (94%)	19 (6%)	18 45
All	All	812/861 (94%)	780 (96%)	32 (4%)	27 55

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	P	66	ARG
2	A	160	ARG
2	A	164	PRO
2	A	167	ARG
2	A	169	ASP
2	A	273	LYS
2	A	404	PRO
2	A	410	GLU
2	A	518	GLU

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Mol	Chain	Res	Type
2	A	549	ARG
2	A	607	GLU
2	A	609	LYS
2	A	638	LEU
3	L	300	ASN
3	L	313	ILE
3	L	318	LEU
3	L	329	ARG
3	L	333	ASP
3	L	335	ASP
3	L	337	CYS
3	L	338	GLN
3	L	340	PRO
3	L	363	GLN
3	L	364	LEU
3	L	365	ASP
3	L	372	LYS
3	L	395	ARG
3	L	499	ARG
3	L	517	THR
3	L	520	LYS
3	L	575	LYS
3	L	636	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	193	HIS
2	A	449	HIS
2	A	464	HIS
2	A	531	GLN
3	L	295	ASN
3	L	300	ASN
3	L	309	ASN
3	L	586	HIS
3	L	636	ASN

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

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

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, 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	P	92/92 (100%)	0.43	4 (4%) 40 30	37, 56, 81, 86	0
2	A	493/540 (91%)	0.95	60 (12%) 10 10	34, 68, 96, 110	0
3	L	394/400 (98%)	0.71	21 (5%) 33 26	25, 63, 98, 116	0
All	All	979/1032 (94%)	0.80	85 (8%) 17 16	25, 65, 97, 116	0

All (85) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	410	GLU	4.9
2	A	186	ASP	4.5
2	A	569	GLU	4.2
2	A	640	GLY	4.1
2	A	179	LEU	4.0
2	A	623	THR	4.0
2	A	578	VAL	3.9
2	A	562	CYS	3.9
2	A	469	ARG	3.8
2	A	546	MET	3.8
2	A	639	PRO	3.8
2	A	584	GLN	3.7
3	L	364	LEU	3.7
2	A	223	CYS	3.6
3	L	395	ARG	3.6
3	L	694	ALA	3.3
2	A	617	ALA	3.3
2	A	607	GLU	3.2
2	A	577	PRO	3.2
3	L	575	LYS	3.2
2	A	582	ARG	3.0
2	A	453	TRP	3.0
2	A	571	LEU	3.0

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Mol	Chain	Res	Type	RSRZ
2	A	589	VAL	2.9
2	A	201	MET	2.9
2	A	504	GLY	2.9
3	L	451	ASP	2.8
2	A	244	GLY	2.8
2	A	198	GLY	2.8
3	L	669	HIS	2.7
3	L	340	PRO	2.7
2	A	245	ALA	2.7
2	A	568	VAL	2.7
2	A	567	GLU	2.7
3	L	443	SER	2.7
2	A	191	SER	2.6
2	A	273	LYS	2.6
2	A	242	ALA	2.6
2	A	604	PRO	2.6
2	A	643	HIS	2.6
3	L	397	GLU	2.6
2	A	515	PHE	2.6
2	A	588	CYS	2.6
3	L	413	THR	2.5
2	A	609	LYS	2.5
2	A	154	ILE	2.5
2	A	172	GLN	2.5
2	A	545	SER	2.5
3	L	617	ASP	2.5
2	A	544	ALA	2.5
2	A	278	GLN	2.4
3	L	568	ASP	2.4
2	A	585	PRO	2.4
1	P	118	LEU	2.4
2	A	579	LEU	2.4
2	A	232	GLY	2.4
2	A	373	SER	2.4
1	P	119	LEU	2.3
1	P	132	GLU	2.3
3	L	494	ASN	2.3
2	A	349	GLY	2.3
3	L	550	LEU	2.3
3	L	398	TYR	2.2
3	L	351	GLU	2.2
2	A	601	CYS	2.2

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Mol	Chain	Res	Type	RSRZ
2	A	538	THR	2.2
2	A	619	GLN	2.2
2	A	189	ILE	2.2
2	A	159	GLU	2.2
3	L	668	PRO	2.2
2	A	626	CYS	2.2
2	A	651	ASP	2.2
2	A	157	ASN	2.1
1	P	70	ASP	2.1
3	L	352	GLY	2.0
3	L	444	TYR	2.0
2	A	376	SER	2.0
2	A	398	MET	2.0
2	A	202	VAL	2.0
2	A	431	GLU	2.0
2	A	307	ALA	2.0
2	A	583	GLY	2.0
3	L	442	SER	2.0
3	L	341	ASP	2.0
2	A	543	GLU	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
4	CA	L	3	1/1	0.55	0.14	117,117,117,117	0
4	CA	L	1	1/1	0.84	0.09	64,64,64,64	0
4	CA	A	2	1/1	0.94	0.06	78,78,78,78	0

6.5 Other polymers (i)

There are no such residues in this entry.