



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 05:16 PM UTC

PDB ID : 1PRG / pdb\_00001prg  
Title : LIGAND BINDING DOMAIN OF THE HUMAN PEROXISOME PROLIF-  
ERATOR ACTIVATED RECEPTOR GAMMA  
Authors : Nolte, R.T.; Wisely, G.B.; Milburn, M.V.  
Deposited on : 1998-07-02  
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](mailto: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>.

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

MolProbity : 4-5-2 with Phenix2.0  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

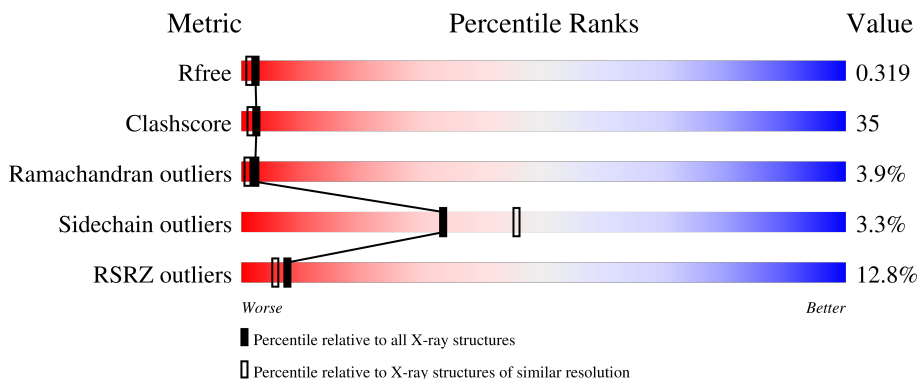
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.20 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))
$R_{free}$	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (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  $\geq 3$ , 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  $\leq 5\%$ . 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	270	 12% (red), 53% (green), 41% (yellow), 6% (orange)
1	B	270	 14% (red), 50% (green), 43% (yellow), 6% (orange)

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4897 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 PROTEIN (PEROXISOME PROLIFERATOR ACTIVATED RECEPTOR GAMMA).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	270	Total	C	N	O	S	0	0	0
			2166	1397	354	405	10			
1	B	270	Total	C	N	O	S	0	0	0
			2166	1397	354	405	10			

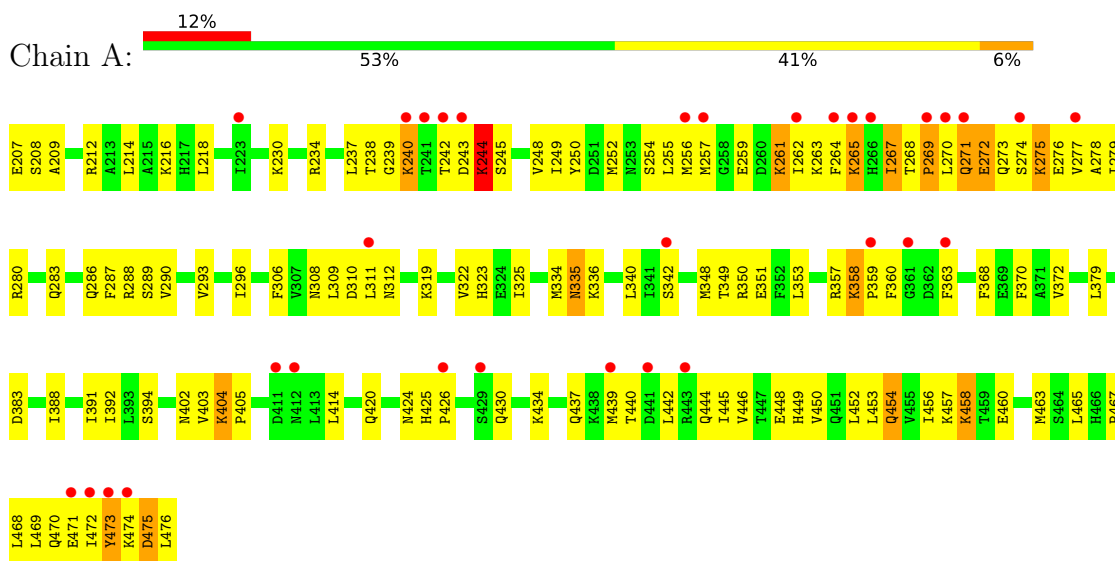
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	288	Total	O	0	0
			288	288		
2	B	277	Total	O	0	0
			277	277		

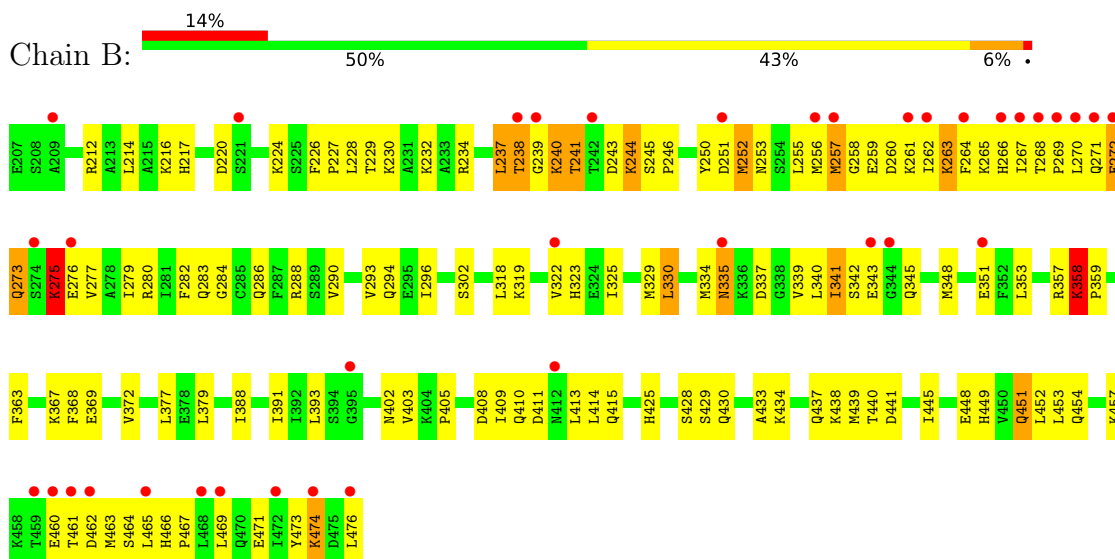
### 3 Residue-property plots [i](#)

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: PROTEIN (PEROXISOME PROLIFERATOR ACTIVATED RECEPTOR GAMMA)



- Molecule 1: PROTEIN (PEROXISOME PROLIFERATOR ACTIVATED RECEPTOR GAMMA)



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	91.87Å 62.00Å 118.34Å 90.00° 102.66° 90.00°	Depositor
Resolution (Å)	60.00 – 2.20 60.00 – 2.20	Depositor EDS
% Data completeness (in resolution range)	83.8 (60.00-2.20) 83.8 (60.00-2.20)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.82 (at 2.00Å)	Xtrriage
Refinement program	CNS 0. 0.3	Depositor
R, $R_{free}$	0.246 , 0.318 0.245 , 0.319	Depositor DCC
$R_{free}$ test set	1342 reflections (4.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.1	Xtrriage
Anisotropy	0.563	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 74.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	4897	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	50.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.26% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.42	0/2203	0.99	10/2967 (0.3%)
1	B	0.41	0/2203	0.95	3/2967 (0.1%)
All	All	0.41	0/4406	0.97	13/5934 (0.2%)

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	243	ASP	N-CA-C	-6.90	105.01	113.50
1	A	403	VAL	N-CA-C	6.58	117.36	110.72
1	A	240	LYS	N-CA-C	-6.17	104.56	111.28
1	A	335	ASN	N-CA-C	-6.01	100.00	108.96
1	A	245	SER	CA-C-N	6.01	126.51	120.14
1	A	245	SER	C-N-CA	6.01	126.51	120.14
1	B	335	ASN	N-CA-C	-5.67	100.51	108.96
1	B	403	VAL	N-CA-C	5.64	118.15	111.09
1	A	248	VAL	N-CA-C	5.60	116.17	107.99
1	B	429	SER	N-CA-C	5.52	118.24	109.96
1	A	473	TYR	N-CA-C	5.34	117.34	107.73
1	A	306	PHE	N-CA-C	5.15	117.30	111.02
1	A	334	MET	N-CA-C	5.02	117.92	110.14

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	2166	0	2232	157	0
1	B	2166	0	2232	156	0
2	A	288	0	0	17	0
2	B	277	0	0	19	0
All	All	4897	0	4464	308	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 35.

All (308) 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:A:259:GLU:HG2	1:A:264:PHE:HB2	1.44	1.00
1:B:325:ILE:HD12	1:B:388:ILE:HG23	1.47	0.97
1:A:293:VAL:HG22	1:A:322:VAL:HG21	1.54	0.89
1:A:357:ARG:HG2	1:A:359:PRO:HD2	1.55	0.89
1:A:349:THR:HG22	1:A:351:GLU:H	1.38	0.87
1:B:466:HIS:N	1:B:467:PRO:HD2	1.90	0.87
1:A:293:VAL:HG11	1:A:468:LEU:HD11	1.57	0.87
1:B:268:THR:HB	1:B:269:PRO:HD2	1.56	0.86
1:B:293:VAL:HG22	1:B:322:VAL:HG21	1.59	0.84
1:B:263:LYS:HE3	1:B:263:LYS:HA	1.60	0.83
1:A:325:ILE:HG23	1:A:388:ILE:HD12	1.62	0.82
1:B:267:ILE:HD13	1:B:280:ARG:HG2	1.62	0.81
1:B:275:LYS:HE3	1:B:275:LYS:HA	1.62	0.81
1:B:286:GLN:HG3	2:B:644:HOH:O	1.80	0.81
1:B:451:GLN:O	1:B:454:GLN:HG2	1.79	0.81
1:A:261:LYS:H	1:A:261:LYS:HD2	1.44	0.80
1:A:212:ARG:O	1:A:216:LYS:HD3	1.82	0.80
1:B:284:GLY:O	1:B:288:ARG:HG2	1.82	0.79
1:B:430:GLN:HE21	1:B:433:ALA:HB2	1.47	0.79
1:B:476:LEU:H	1:B:476:LEU:HD23	1.50	0.77
1:B:325:ILE:HG22	1:B:329:MET:HE2	1.67	0.77
1:A:430:GLN:O	1:A:434:LYS:HG2	1.84	0.76
1:A:249:ILE:HD12	1:A:255:LEU:HA	1.67	0.76
1:A:440:THR:HB	1:B:440:THR:HG22	1.67	0.73
1:A:348:MET:SD	1:A:353:LEU:HD21	2.28	0.73
1:B:269:PRO:HA	1:B:280:ARG:NH2	2.03	0.73
1:B:258:GLY:O	1:B:262:ILE:HG22	1.89	0.72
1:B:340:LEU:O	1:B:341:ILE:HD12	1.89	0.72
1:A:458:LYS:NZ	1:A:458:LYS:HB3	2.05	0.72
1:B:463:MET:HB2	1:B:466:HIS:HD2	1.53	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:349:THR:HG22	1:A:351:GLU:N	2.04	0.71
1:A:238:THR:O	1:A:240:LYS:N	2.23	0.71
1:A:270:LEU:HD13	1:A:271:GLN:N	2.06	0.70
1:B:252:MET:O	1:B:256:MET:HG2	1.92	0.70
1:A:287:PHE:O	1:A:290:VAL:HG12	1.91	0.70
1:A:325:ILE:HD13	1:A:388:ILE:HG23	1.75	0.69
1:A:244:LYS:HA	2:A:694:HOH:O	1.92	0.68
1:A:358:LYS:HB2	1:A:359:PRO:CD	2.22	0.68
1:B:430:GLN:HG3	1:B:433:ALA:HB3	1.76	0.68
1:A:271:GLN:HE21	1:A:276:GLU:HA	1.59	0.67
1:B:270:LEU:HD22	2:B:708:HOH:O	1.94	0.67
1:B:252:MET:HE2	2:B:712:HOH:O	1.95	0.67
1:B:276:GLU:CB	1:B:357:ARG:HH22	2.07	0.67
1:B:323:HIS:HE1	1:B:476:LEU:HB2	1.61	0.66
1:A:296:ILE:HB	2:A:605:HOH:O	1.94	0.66
1:A:319:LYS:HE2	1:A:472:ILE:HA	1.77	0.66
1:A:267:ILE:HB	1:A:280:ARG:CZ	2.25	0.66
1:B:267:ILE:HG12	1:B:268:THR:H	1.60	0.66
1:B:469:LEU:HD13	1:B:469:LEU:O	1.96	0.65
1:A:268:THR:N	1:A:269:PRO:HD2	2.11	0.65
1:A:265:LYS:HB3	1:A:265:LYS:NZ	2.11	0.65
1:B:270:LEU:H	1:B:280:ARG:CZ	2.09	0.65
1:A:402:ASN:HB3	2:A:675:HOH:O	1.95	0.65
1:A:293:VAL:HG22	1:A:322:VAL:CG2	2.27	0.65
1:A:437:GLN:O	1:A:440:THR:HG22	1.96	0.64
1:A:458:LYS:HB3	1:A:458:LYS:HZ3	1.62	0.64
1:B:271:GLN:NE2	1:B:277:VAL:HG23	2.13	0.64
1:A:475:ASP:HB3	2:A:565:HOH:O	1.98	0.64
1:B:214:LEU:HD21	1:B:413:LEU:HD23	1.80	0.64
1:A:271:GLN:O	1:A:276:GLU:HA	1.97	0.63
1:A:475:ASP:O	1:A:476:LEU:HB3	1.99	0.63
1:A:279:ILE:HG22	1:A:283:GLN:HE21	1.63	0.62
1:A:363:PHE:CE2	1:A:456:ILE:HD11	2.34	0.62
1:B:358:LYS:HE3	1:B:358:LYS:N	2.14	0.62
1:A:336:LYS:HD3	1:A:350:ARG:NH1	2.16	0.61
1:B:430:GLN:HE21	1:B:433:ALA:CB	2.14	0.60
1:A:244:LYS:HB2	1:A:244:LYS:NZ	2.16	0.60
1:A:357:ARG:HH12	1:A:460:GLU:CD	2.10	0.59
1:B:275:LYS:HA	1:B:275:LYS:CE	2.31	0.59
1:B:473:TYR:O	1:B:474:LYS:C	2.45	0.59
1:A:276:GLU:OE2	1:A:278:ALA:HB3	2.03	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:270:LEU:H	1:B:280:ARG:NH2	1.99	0.59
1:A:256:MET:O	1:A:268:THR:HG23	2.02	0.59
1:A:261:LYS:HB2	2:A:710:HOH:O	2.02	0.59
1:A:230:LYS:HE2	1:A:379:LEU:O	2.02	0.59
1:B:358:LYS:HB2	1:B:359:PRO:HD3	1.85	0.59
1:A:271:GLN:HA	1:A:280:ARG:HH12	1.68	0.59
1:B:272:GLU:O	1:B:272:GLU:HG2	2.03	0.59
1:A:359:PRO:HG2	1:A:360:PHE:CD1	2.37	0.59
1:A:259:GLU:OE2	1:A:268:THR:HA	2.03	0.58
1:A:271:GLN:NE2	1:A:277:VAL:H	2.02	0.58
1:A:336:LYS:HD3	1:A:350:ARG:HH12	1.67	0.58
1:B:279:ILE:O	1:B:283:GLN:HG3	2.02	0.58
1:B:260:ASP:HB2	1:B:269:PRO:HG3	1.85	0.58
1:B:263:LYS:HA	1:B:263:LYS:CE	2.33	0.58
1:A:476:LEU:C	1:A:476:LEU:HD23	2.28	0.58
1:B:454:GLN:O	1:B:457:LYS:HB3	2.03	0.57
1:B:451:GLN:OE1	1:B:451:GLN:C	2.48	0.57
1:A:310:ASP:OD2	1:A:312:ASN:HB2	2.03	0.57
1:B:330:LEU:CD2	1:B:334:MET:HE3	2.34	0.57
1:B:269:PRO:HA	1:B:280:ARG:HH22	1.69	0.57
1:A:448:GLU:O	1:A:452:LEU:HG	2.05	0.57
1:A:471:GLU:C	1:A:473:TYR:H	2.11	0.57
1:B:216:LYS:HD3	1:B:216:LYS:O	2.05	0.57
1:B:471:GLU:O	1:B:474:LYS:HG3	2.05	0.57
1:A:286:GLN:NE2	1:A:465:LEU:HD12	2.19	0.56
1:A:288:ARG:HD3	1:A:289:SER:N	2.19	0.56
1:B:256:MET:C	1:B:258:GLY:H	2.12	0.56
1:A:276:GLU:CG	1:A:279:ILE:HG12	2.36	0.56
1:A:454:GLN:O	1:A:457:LYS:HB3	2.05	0.56
1:A:388:ILE:HG13	2:A:693:HOH:O	2.06	0.56
1:B:271:GLN:O	1:B:272:GLU:HB3	2.06	0.56
1:B:358:LYS:HE3	1:B:358:LYS:CA	2.36	0.56
1:B:368:PHE:O	1:B:372:VAL:HG23	2.06	0.56
1:A:368:PHE:O	1:A:372:VAL:HG23	2.06	0.55
1:B:212:ARG:HB3	1:B:212:ARG:NH1	2.21	0.55
1:A:242:THR:O	1:A:242:THR:HG22	2.07	0.55
1:A:270:LEU:HD13	1:A:270:LEU:C	2.31	0.55
1:B:466:HIS:N	1:B:467:PRO:CD	2.67	0.55
1:A:391:ILE:HG12	1:A:439:MET:HE3	1.88	0.55
1:B:330:LEU:HD22	1:B:334:MET:HE3	1.87	0.55
1:A:268:THR:HB	1:A:269:PRO:CD	2.37	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:404:LYS:HE3	2:A:567:HOH:O	2.07	0.55
1:B:271:GLN:O	1:B:271:GLN:HG3	2.07	0.55
1:A:275:LYS:O	1:A:280:ARG:HD3	2.07	0.54
1:A:276:GLU:HG2	1:A:279:ILE:HG12	1.88	0.54
1:A:440:THR:O	1:A:444:GLN:HG2	2.08	0.54
1:A:467:PRO:HB2	2:A:704:HOH:O	2.07	0.54
1:B:282:PHE:O	1:B:286:GLN:HG2	2.07	0.54
1:A:263:LYS:HZ3	1:A:265:LYS:HG3	1.71	0.54
1:A:359:PRO:HG2	1:A:360:PHE:HD1	1.73	0.54
1:A:268:THR:H	1:A:269:PRO:HD2	1.72	0.54
1:B:465:LEU:C	1:B:467:PRO:HD2	2.33	0.54
1:B:267:ILE:HG12	1:B:268:THR:N	2.23	0.54
1:A:288:ARG:HD3	1:A:288:ARG:C	2.33	0.54
1:A:449:HIS:O	1:A:453:LEU:HB2	2.07	0.54
1:B:260:ASP:OD1	1:B:260:ASP:O	2.26	0.54
1:A:267:ILE:HD12	1:A:280:ARG:HD2	1.90	0.53
1:A:424:ASN:C	1:A:426:PRO:HD3	2.33	0.53
1:B:269:PRO:O	1:B:270:LEU:HD23	2.08	0.53
1:B:276:GLU:HB2	1:B:357:ARG:NH2	2.23	0.53
1:A:212:ARG:HH12	1:A:420:GLN:HA	1.74	0.53
1:A:474:LYS:O	1:A:475:ASP:O	2.25	0.53
1:B:358:LYS:HE3	1:B:358:LYS:HA	1.91	0.53
1:B:273:GLN:OE1	1:B:273:GLN:N	2.42	0.53
1:B:276:GLU:HB2	1:B:357:ARG:HH22	1.72	0.53
1:A:319:LYS:CE	1:A:472:ILE:HA	2.39	0.53
1:B:296:ILE:HG22	2:B:686:HOH:O	2.09	0.53
1:B:256:MET:HE1	1:B:271:GLN:CB	2.39	0.53
1:A:311:LEU:C	1:A:311:LEU:HD23	2.34	0.52
1:A:370:PHE:CZ	1:A:442:LEU:HD21	2.43	0.52
1:B:259:GLU:HG2	1:B:268:THR:HA	1.91	0.52
1:B:266:HIS:HE1	2:B:602:HOH:O	1.91	0.52
1:A:265:LYS:HB3	1:A:265:LYS:HZ2	1.73	0.52
1:B:273:GLN:HB2	2:B:548:HOH:O	2.09	0.52
1:A:267:ILE:HD12	1:A:275:LYS:HB3	1.92	0.52
1:A:335:ASN:HA	2:A:515:HOH:O	2.10	0.52
1:B:237:LEU:HD21	1:B:340:LEU:HG	1.91	0.52
1:B:408:ASP:HB3	2:B:558:HOH:O	2.08	0.52
1:A:349:THR:HG23	2:A:691:HOH:O	2.09	0.52
1:A:468:LEU:HD13	1:A:468:LEU:C	2.35	0.52
1:B:275:LYS:O	1:B:280:ARG:HD2	2.09	0.52
1:B:441:ASP:O	1:B:445:ILE:HG12	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:230:LYS:O	1:A:234:ARG:HG2	2.10	0.52
1:A:257:MET:C	1:A:259:GLU:H	2.16	0.52
1:A:279:ILE:HD13	1:A:360:PHE:CZ	2.46	0.51
1:A:357:ARG:O	1:A:358:LYS:C	2.53	0.51
1:A:370:PHE:HB2	1:A:445:ILE:HD11	1.92	0.51
1:B:393:LEU:O	1:B:410:GLN:HB2	2.10	0.51
1:A:383:ASP:OD2	1:A:425:HIS:HE1	1.93	0.51
1:B:230:LYS:O	1:B:234:ARG:HG2	2.10	0.51
1:B:294:GLN:HG2	2:B:611:HOH:O	2.10	0.51
1:A:244:LYS:HB2	1:A:244:LYS:HZ2	1.75	0.50
1:A:467:PRO:HA	1:A:470:GLN:HB3	1.93	0.50
1:A:336:LYS:HE2	1:A:372:VAL:HG21	1.92	0.50
1:A:252:MET:HB2	2:A:666:HOH:O	2.10	0.50
1:A:358:LYS:HB2	1:A:359:PRO:HD3	1.92	0.50
1:A:388:ILE:HG21	2:A:693:HOH:O	2.10	0.50
1:A:262:ILE:HD12	2:A:660:HOH:O	2.10	0.50
1:A:271:GLN:NE2	1:A:272:GLU:N	2.60	0.50
1:A:288:ARG:HB2	2:A:551:HOH:O	2.11	0.50
1:B:325:ILE:CD1	1:B:388:ILE:HG23	2.30	0.50
1:A:261:LYS:HD2	1:A:261:LYS:N	2.21	0.50
1:B:271:GLN:HA	1:B:271:GLN:HE21	1.76	0.50
1:A:207:GLU:HG3	1:A:209:ALA:HB3	1.94	0.50
1:B:460:GLU:HB2	2:B:590:HOH:O	2.11	0.49
1:B:265:LYS:O	1:B:265:LYS:HG3	2.10	0.49
1:B:339:VAL:HG13	1:B:341:ILE:CD1	2.41	0.49
1:B:411:ASP:O	1:B:415:GLN:HG3	2.12	0.49
1:B:318:LEU:HG	2:B:686:HOH:O	2.12	0.49
1:B:425:HIS:HB3	1:B:428:SER:HB3	1.95	0.49
1:B:216:LYS:HE3	1:B:220:ASP:OD2	2.13	0.49
1:A:286:GLN:NE2	1:A:465:LEU:HA	2.28	0.49
1:B:408:ASP:HA	2:B:643:HOH:O	2.13	0.49
1:B:448:GLU:O	1:B:451:GLN:HB3	2.13	0.48
1:A:238:THR:C	1:A:240:LYS:H	2.21	0.48
1:A:259:GLU:HA	1:A:262:ILE:O	2.13	0.48
1:A:430:GLN:HG2	1:B:414:LEU:HD13	1.94	0.48
1:B:264:PHE:HE2	1:B:267:ILE:HG22	1.76	0.48
1:A:456:ILE:HG21	1:A:463:MET:HE1	1.95	0.48
1:B:294:GLN:HE21	1:B:294:GLN:HA	1.78	0.48
1:B:363:PHE:HE1	1:B:449:HIS:NE2	2.12	0.48
1:A:261:LYS:HG2	1:A:262:ILE:HG13	1.93	0.48
1:A:267:ILE:CD1	1:A:275:LYS:HB3	2.44	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:463:MET:HB2	1:B:466:HIS:CD2	2.42	0.48
1:A:319:LYS:CD	1:A:472:ILE:HA	2.45	0.47
1:B:391:ILE:HG12	1:B:439:MET:HE3	1.96	0.47
1:B:340:LEU:C	1:B:341:ILE:HD12	2.39	0.47
1:A:275:LYS:HB2	2:A:548:HOH:O	2.13	0.47
1:A:214:LEU:O	1:A:218:LEU:HG	2.15	0.47
1:A:359:PRO:HG2	1:A:360:PHE:H	1.79	0.47
1:B:240:LYS:O	1:B:241:THR:C	2.57	0.47
1:B:341:ILE:HG23	1:B:342:SER:N	2.30	0.47
1:B:369:GLU:HG2	2:B:727:HOH:O	2.15	0.47
1:A:471:GLU:C	1:A:473:TYR:N	2.72	0.47
1:B:243:ASP:HB3	2:B:704:HOH:O	2.14	0.47
1:A:257:MET:C	1:A:259:GLU:N	2.73	0.47
1:A:271:GLN:C	1:A:276:GLU:HA	2.40	0.47
1:B:434:LYS:O	1:B:437:GLN:HG2	2.15	0.46
1:B:438:LYS:O	1:B:441:ASP:HB2	2.16	0.46
1:B:457:LYS:HD2	1:B:457:LYS:O	2.15	0.46
1:A:430:GLN:HG2	1:B:414:LEU:CD1	2.45	0.46
1:B:348:MET:SD	1:B:353:LEU:HD21	2.56	0.46
1:A:264:PHE:HE1	1:A:342:SER:HB3	1.81	0.46
1:B:351:GLU:C	1:B:351:GLU:CD	2.84	0.46
1:B:267:ILE:CD1	1:B:280:ARG:HG2	2.40	0.45
1:B:341:ILE:CG2	1:B:342:SER:N	2.78	0.45
1:B:268:THR:O	1:B:270:LEU:HG	2.17	0.45
1:A:468:LEU:HD12	1:A:469:LEU:HD12	1.99	0.45
1:B:268:THR:HB	1:B:269:PRO:CD	2.36	0.45
1:B:268:THR:HG21	2:B:600:HOH:O	2.16	0.45
1:B:402:ASN:OD1	1:B:405:PRO:HD2	2.17	0.45
1:A:276:GLU:HG3	1:A:279:ILE:H	1.81	0.45
1:B:262:ILE:HD11	1:B:345:GLN:HB2	1.98	0.45
1:A:276:GLU:OE2	1:A:357:ARG:CZ	2.65	0.45
1:A:425:HIS:N	1:A:426:PRO:HD3	2.31	0.45
1:B:212:ARG:HA	1:B:212:ARG:HH11	1.81	0.45
1:B:276:GLU:CB	1:B:357:ARG:NH2	2.78	0.45
1:B:463:MET:CB	1:B:466:HIS:HD2	2.25	0.44
1:A:311:LEU:HD23	1:A:311:LEU:O	2.17	0.44
1:B:290:VAL:HG21	1:B:473:TYR:CD1	2.53	0.44
1:A:208:SER:O	1:A:212:ARG:HG2	2.17	0.44
1:B:319:LYS:HG3	1:B:476:LEU:HD11	1.98	0.44
1:A:212:ARG:NH1	1:A:420:GLN:HA	2.32	0.44
1:B:277:VAL:HA	1:B:280:ARG:HD3	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:234:ARG:HD3	2:B:554:HOH:O	2.17	0.44
1:B:430:GLN:NE2	1:B:433:ALA:HB2	2.24	0.44
1:A:453:LEU:CD2	1:A:473:TYR:CE2	3.00	0.44
1:A:336:LYS:HE2	1:A:372:VAL:HG11	1.99	0.44
1:A:277:VAL:HG13	1:A:278:ALA:N	2.32	0.44
1:A:325:ILE:HD11	1:A:392:ILE:CG1	2.48	0.44
1:B:272:GLU:O	1:B:273:GLN:C	2.61	0.44
1:B:256:MET:C	1:B:258:GLY:N	2.76	0.43
1:A:271:GLN:HE21	1:A:271:GLN:C	2.25	0.43
1:A:308:ASN:ND2	2:A:696:HOH:O	2.51	0.43
1:A:276:GLU:OE2	1:A:357:ARG:NE	2.51	0.43
1:A:237:LEU:HD21	1:A:340:LEU:HG	2.01	0.43
1:A:287:PHE:CD1	1:A:287:PHE:C	2.97	0.43
1:A:383:ASP:OD2	1:A:425:HIS:CE1	2.71	0.43
1:B:217:HIS:HE1	1:B:302:SER:O	2.01	0.43
1:B:245:SER:HA	1:B:246:PRO:HD3	1.80	0.43
1:B:257:MET:O	1:B:261:LYS:HD2	2.19	0.43
1:A:273:GLN:OE1	1:A:273:GLN:HA	2.18	0.43
1:A:286:GLN:HE21	1:A:465:LEU:CD1	2.32	0.42
1:B:256:MET:HE1	1:B:271:GLN:HB2	1.99	0.42
1:B:220:ASP:O	1:B:224:LYS:HG2	2.18	0.42
1:B:237:LEU:O	1:B:238:THR:C	2.62	0.42
1:B:255:LEU:CD2	1:B:277:VAL:HG13	2.49	0.42
1:A:309:LEU:O	1:A:310:ASP:C	2.62	0.42
1:B:237:LEU:O	1:B:239:GLY:N	2.52	0.42
1:B:296:ILE:HD12	1:B:322:VAL:HG23	2.01	0.42
1:B:476:LEU:H	1:B:476:LEU:CD2	2.26	0.42
1:B:440:THR:HB	2:B:636:HOH:O	2.19	0.42
1:A:259:GLU:CD	1:A:268:THR:HG1	2.28	0.42
1:A:434:LYS:NZ	1:B:410:GLN:HE21	2.18	0.42
1:B:460:GLU:OE2	1:B:466:HIS:NE2	2.53	0.42
1:B:212:ARG:HH11	1:B:212:ARG:CA	2.32	0.42
1:B:244:LYS:O	1:B:244:LYS:HG3	2.19	0.42
1:B:451:GLN:OE1	1:B:452:LEU:N	2.53	0.42
1:B:343:GLU:HG3	1:B:343:GLU:O	2.20	0.42
1:B:226:PHE:HA	1:B:227:PRO:HD3	1.92	0.42
1:B:460:GLU:C	1:B:460:GLU:OE1	2.63	0.42
1:B:457:LYS:O	1:B:461:THR:CG2	2.68	0.41
1:A:271:GLN:NE2	1:A:271:GLN:C	2.78	0.41
1:A:271:GLN:HB2	1:A:277:VAL:N	2.35	0.41
1:A:335:ASN:OD1	1:A:335:ASN:C	2.63	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:458:LYS:NZ	1:A:458:LYS:CB	2.81	0.41
1:B:357:ARG:O	1:B:358:LYS:C	2.63	0.41
1:B:437:GLN:HB2	2:B:593:HOH:O	2.21	0.41
2:A:749:HOH:O	1:B:438:LYS:HE2	2.20	0.41
1:B:240:LYS:HE3	2:B:515:HOH:O	2.21	0.41
1:B:259:GLU:OE2	1:B:267:ILE:HG23	2.21	0.41
1:A:268:THR:N	1:A:269:PRO:CD	2.81	0.41
1:A:319:LYS:HD3	1:A:472:ILE:HA	2.01	0.41
1:A:446:VAL:O	1:A:450:VAL:HG23	2.20	0.41
1:B:253:ASN:O	1:B:257:MET:HG3	2.21	0.41
1:B:377:LEU:HB2	1:B:379:LEU:HD13	2.01	0.41
1:B:434:LYS:HA	1:B:437:GLN:NE2	2.35	0.41
1:A:404:LYS:N	1:A:405:PRO:HD2	2.35	0.41
1:A:437:GLN:C	1:A:439:MET:N	2.78	0.41
1:B:250:TYR:HD1	1:B:251:ASP:OD2	2.04	0.41
1:B:267:ILE:HD11	1:B:270:LEU:HD12	2.02	0.41
1:B:335:ASN:ND2	1:B:337:ASP:HB2	2.36	0.41
1:A:349:THR:CG2	1:A:351:GLU:H	2.20	0.41
1:A:268:THR:HB	1:A:269:PRO:HD3	2.01	0.41
1:A:271:GLN:HA	1:A:280:ARG:NH1	2.35	0.41
1:A:272:GLU:C	1:A:274:SER:H	2.29	0.41
1:A:414:LEU:CB	1:B:430:GLN:HG2	2.51	0.41
1:A:476:LEU:C	1:A:476:LEU:CD2	2.92	0.41
1:B:227:PRO:HG2	2:B:589:HOH:O	2.21	0.41
1:A:250:TYR:CE2	1:A:254:SER:OG	2.70	0.41
1:B:367:LYS:HZ1	1:B:449:HIS:HB2	1.85	0.41
1:B:451:GLN:C	1:B:453:LEU:N	2.76	0.40
1:A:286:GLN:NE2	1:A:465:LEU:CD1	2.83	0.40
1:A:323:HIS:NE2	1:A:472:ILE:HD11	2.36	0.40
1:A:325:ILE:HD11	1:A:392:ILE:HG13	2.03	0.40
1:B:229:THR:OG1	1:B:232:LYS:HB2	2.22	0.40
1:B:405:PRO:O	1:B:409:ILE:HG13	2.22	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	268/270 (99%)	242 (90%)	17 (6%)	9 (3%)	3	1
1	B	268/270 (99%)	236 (88%)	20 (8%)	12 (4%)	2	1
All	All	536/540 (99%)	478 (89%)	37 (7%)	21 (4%)	2	1

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	239	GLY
1	A	272	GLU
1	A	475	ASP
1	B	237	LEU
1	B	240	LYS
1	B	272	GLU
1	B	474	LYS
1	A	267	ILE
1	A	394	SER
1	B	244	LYS
1	B	257	MET
1	B	464	SER
1	A	269	PRO
1	B	238	THR
1	B	241	THR
1	B	275	LYS
1	B	462	ASP
1	A	244	LYS
1	A	358	LYS
1	A	275	LYS
1	B	358	LYS

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	243/243 (100%)	236 (97%)	7 (3%)	37	51
1	B	243/243 (100%)	234 (96%)	9 (4%)	30	41
All	All	486/486 (100%)	470 (97%)	16 (3%)	33	45

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	244	LYS
1	A	261	LYS
1	A	265	LYS
1	A	271	GLN
1	A	404	LYS
1	A	454	GLN
1	A	458	LYS
1	B	228	LEU
1	B	252	MET
1	B	263	LYS
1	B	273	GLN
1	B	275	LYS
1	B	330	LEU
1	B	341	ILE
1	B	358	LYS
1	B	451	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	271	GLN
1	A	283	GLN
1	A	286	GLN
1	A	308	ASN
1	A	314	GLN
1	A	345	GLN
1	A	402	ASN
1	A	410	GLN
1	A	425	HIS
1	A	449	HIS
1	A	451	GLN
1	A	454	GLN
1	B	217	HIS
1	B	253	ASN

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Mol	Chain	Res	Type
1	B	266	HIS
1	B	271	GLN
1	B	283	GLN
1	B	294	GLN
1	B	308	ASN
1	B	323	HIS
1	B	410	GLN
1	B	412	ASN
1	B	430	GLN
1	B	444	GLN
1	B	449	HIS
1	B	466	HIS
1	B	470	GLN

### 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 oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	270/270 (100%)	0.83	32 (11%) <b>9</b> <b>7</b>	27, 43, 82, 90	0
1	B	270/270 (100%)	0.87	37 (13%) <b>6</b> <b>5</b>	26, 45, 83, 93	0
All	All	540/540 (100%)	0.85	69 (12%) <b>7</b> <b>5</b>	26, 44, 83, 93	0

All (69) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	268	THR	6.7
1	B	269	PRO	4.7
1	A	243	ASP	4.4
1	B	469	LEU	4.3
1	B	270	LEU	3.9
1	B	239	GLY	3.8
1	A	242	THR	3.7
1	B	274	SER	3.6
1	A	472	ILE	3.6
1	B	264	PHE	3.5
1	A	256	MET	3.4
1	B	266	HIS	3.4
1	A	270	LEU	3.4
1	B	476	LEU	3.4
1	A	361	GLY	3.4
1	B	242	THR	3.4
1	A	241	THR	3.1
1	A	269	PRO	3.1
1	B	461	THR	3.1
1	A	429	SER	3.1
1	B	459	THR	3.0
1	A	266	HIS	2.9
1	B	221	SER	2.9
1	B	344	GLY	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	265	LYS	2.9
1	B	343	GLU	2.8
1	A	274	SER	2.8
1	A	257	MET	2.8
1	A	264	PHE	2.8
1	B	238	THR	2.7
1	B	272	GLU	2.7
1	B	276	GLU	2.7
1	B	209	ALA	2.7
1	A	474	LYS	2.6
1	A	271	GLN	2.6
1	B	462	ASP	2.6
1	B	460	GLU	2.6
1	A	426	PRO	2.6
1	A	342	SER	2.6
1	B	261	LYS	2.6
1	A	412	ASN	2.5
1	B	251	ASP	2.5
1	A	262	ILE	2.5
1	B	267	ILE	2.5
1	A	439	MET	2.5
1	A	363	PHE	2.4
1	A	443	ARG	2.4
1	A	473	TYR	2.4
1	B	262	ILE	2.4
1	A	311	LEU	2.4
1	B	271	GLN	2.3
1	B	472	ILE	2.3
1	B	465	LEU	2.3
1	A	411	ASP	2.3
1	B	395	GLY	2.2
1	B	322	VAL	2.2
1	B	335	ASN	2.2
1	A	240	LYS	2.2
1	A	441	ASP	2.1
1	A	471	GLU	2.1
1	B	474	LYS	2.1
1	B	412	ASN	2.1
1	A	359	PRO	2.1
1	B	257	MET	2.1
1	B	351	GLU	2.1
1	B	468	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	277	VAL	2.1
1	B	256	MET	2.0
1	A	223	ILE	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 oligosaccharides in this entry.

## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.