



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 10:32 AM UTC

PDB ID : 2PLF / pdb\_00002plf  
Title : The structure of aIF2 $\gamma$  subunit from the archaeon *Sulfolobus solfataricus* in the nucleotide-free form.  
Authors : Nikonov, O.S.; Stolboushkina, E.A.; Nikulin, A.D.; Hasenohrl, D.; Blaesl, U.; Manstein, D.J.; Fedorov, R.V.; Garber, M.B.; Nikonov, S.V.  
Deposited on : 2007-04-19  
Resolution : 2.90 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  
Xtriage (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

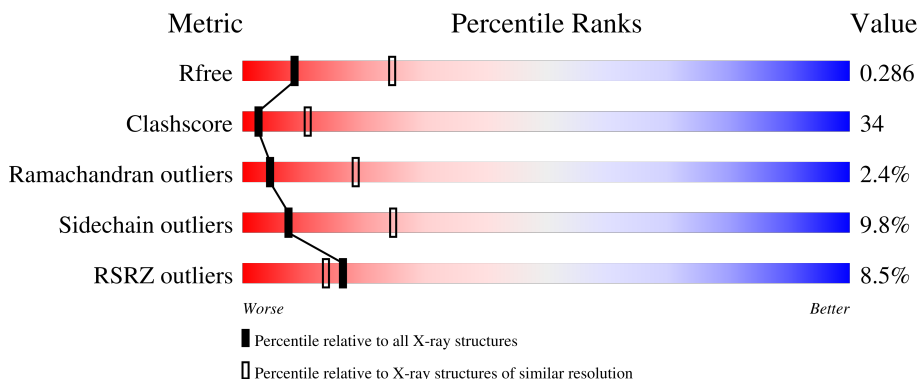
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 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	2481 (2.90-2.90)
Clashscore	190562	2690 (2.90-2.90)
Ramachandran outliers	187476	2623 (2.90-2.90)
Sidechain outliers	187428	2625 (2.90-2.90)
RSRZ outliers	180081	2481 (2.90-2.90)

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	414	

## 2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 3311 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 Translation initiation factor 2 gamma subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	414	3213	2058	548	595	12	0	0	0

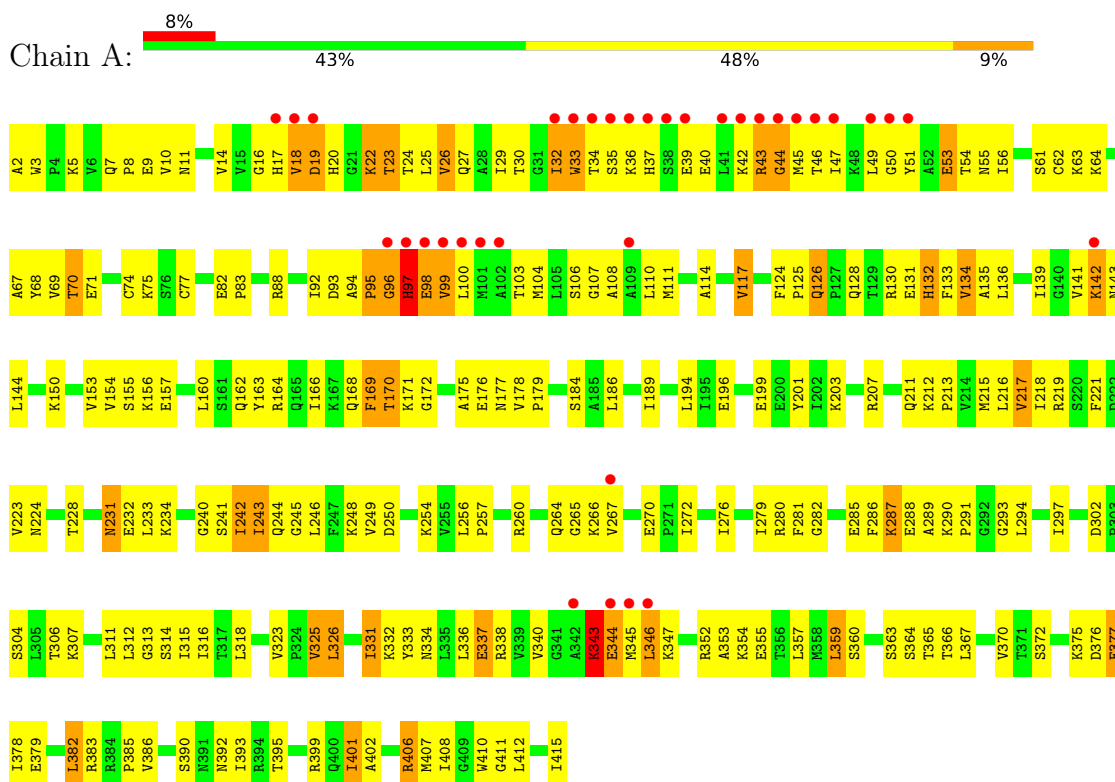
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	98	Total	O	0	0
			98	98		

### 3 Residue-property plots

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: Translation initiation factor 2 gamma subunit



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	94.84Å 94.84Å 166.43Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	20.00 – 2.90 20.00 – 2.90	Depositor EDS
% Data completeness (in resolution range)	98.1 (20.00-2.90) 99.1 (20.00-2.90)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.79 (at 2.89Å)	Xtrriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.222 , 0.288 0.226 , 0.286	Depositor DCC
$R_{free}$ test set	984 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	56.4	Xtrriage
Anisotropy	0.600	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 71.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.046 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	3311	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.63% 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	0.58	0/3272	1.11	23/4430 (0.5%)

There are no bond length outliers.

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	18	VAL	CB-CA-C	-9.92	102.42	111.74
1	A	23	THR	N-CA-C	-9.80	101.45	113.41
1	A	95	PRO	CA-N-CD	-8.74	99.76	112.00
1	A	343	LYS	N-CA-C	8.09	119.73	111.07
1	A	70	THR	N-CA-C	-7.11	103.71	112.88
1	A	26	VAL	N-CA-C	-7.02	103.63	110.72
1	A	169	PHE	N-CA-C	-6.85	104.80	113.43
1	A	97	HIS	CA-CB-CG	-6.53	107.28	113.80
1	A	401	ILE	N-CA-C	-6.46	101.25	109.58
1	A	132	HIS	N-CA-C	-6.13	104.60	111.28
1	A	323	VAL	CA-C-N	-5.99	114.10	120.03
1	A	323	VAL	C-N-CA	-5.99	114.10	120.03
1	A	297	ILE	N-CA-C	5.74	116.12	107.80
1	A	344	GLU	N-CA-C	5.65	119.44	112.03
1	A	243	ILE	N-CA-C	5.62	116.27	110.82
1	A	331	ILE	N-CA-C	5.59	116.17	108.12
1	A	377	GLU	N-CA-C	5.55	118.50	109.24
1	A	170	THR	N-CA-C	-5.41	106.52	113.01
1	A	221	PHE	N-CA-C	5.39	116.72	108.42
1	A	382	LEU	N-CA-C	5.29	117.96	110.50
1	A	114	ALA	N-CA-C	5.24	115.97	108.74
1	A	62	CYS	N-CA-C	5.02	117.93	110.14
1	A	346	LEU	N-CA-C	5.01	117.32	110.55

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	3213	0	3332	222	0
2	A	98	0	0	4	0
All	All	3311	0	3332	222	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 34.

All (222) 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:32:ILE:HD11	1:A:39:GLU:HG3	1.47	0.94
1:A:390:SER:H	1:A:393:ILE:HD11	1.33	0.92
1:A:100:LEU:HB3	1:A:104:MET:HB2	1.52	0.91
1:A:43:ARG:HD3	1:A:280:ARG:HH21	1.35	0.91
1:A:40:GLU:HG2	1:A:45:MET:HA	1.48	0.91
1:A:337:GLU:CD	1:A:337:GLU:H	1.71	0.91
1:A:144:LEU:HD23	1:A:178:VAL:HG11	1.54	0.90
1:A:51:TYR:CE2	1:A:294:LEU:HG	2.06	0.89
1:A:338:ARG:HB3	1:A:338:ARG:NH1	1.92	0.85
1:A:287:LYS:HE3	1:A:287:LYS:H	1.38	0.85
1:A:16:GLY:HA2	1:A:117:VAL:HG13	1.58	0.84
1:A:132:HIS:O	1:A:136:LEU:HD13	1.81	0.80
1:A:135:ALA:HB2	1:A:407:MET:HE1	1.64	0.80
1:A:47:ILE:HG22	1:A:219:ARG:HE	1.47	0.80
1:A:340:VAL:HA	1:A:345:MET:HA	1.64	0.79
1:A:24:THR:HA	1:A:27:GLN:HB3	1.63	0.79
1:A:352:ARG:HD3	1:A:355:GLU:HB3	1.65	0.78
1:A:33:TRP:O	1:A:37:HIS:HB3	1.84	0.77
1:A:184:SER:HB3	1:A:189:ILE:HB	1.65	0.77
1:A:135:ALA:CB	1:A:407:MET:HE1	2.15	0.76
1:A:333:TYR:CE2	1:A:378:ILE:HG23	2.20	0.76
1:A:325:VAL:O	1:A:325:VAL:CG2	2.33	0.75
1:A:340:VAL:CG1	1:A:345:MET:HG3	2.18	0.74
1:A:107:GLY:O	1:A:111:MET:HB2	1.88	0.74
1:A:46:THR:HB	1:A:49:LEU:HB2	1.70	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:176:GLU:C	1:A:177:ASN:HD22	1.98	0.71
1:A:218:ILE:HG12	1:A:240:GLY:HA2	1.73	0.71
1:A:74:CYS:SG	1:A:83:PRO:HB3	2.31	0.70
1:A:312:LEU:HD12	1:A:313:GLY:N	2.07	0.70
1:A:352:ARG:CD	1:A:355:GLU:HB3	2.24	0.68
1:A:50:GLY:O	1:A:92:ILE:HA	1.94	0.68
1:A:337:GLU:O	1:A:347:LYS:HD2	1.95	0.67
1:A:143:ASN:HB3	1:A:201:TYR:O	1.94	0.67
1:A:338:ARG:HB3	1:A:338:ARG:HH11	1.57	0.67
1:A:287:LYS:H	1:A:287:LYS:CE	2.09	0.66
1:A:340:VAL:HG12	1:A:345:MET:HG3	1.77	0.66
1:A:19:ASP:HA	1:A:96:GLY:HA2	1.76	0.66
1:A:360:SER:CB	1:A:365:THR:HG22	2.27	0.65
1:A:280:ARG:HH11	1:A:280:ARG:HB2	1.62	0.65
1:A:46:THR:HB	1:A:49:LEU:CB	2.27	0.64
1:A:281:PHE:HB2	1:A:286:PHE:CE2	2.33	0.64
1:A:99:VAL:O	1:A:99:VAL:HG12	1.98	0.64
1:A:249:VAL:O	1:A:250:ASP:HB2	1.97	0.63
1:A:313:GLY:O	1:A:364:SER:HB3	1.96	0.63
1:A:406:ARG:HB3	1:A:406:ARG:HH11	1.64	0.63
1:A:51:TYR:OH	1:A:294:LEU:N	2.27	0.63
1:A:325:VAL:O	1:A:325:VAL:HG22	1.97	0.62
1:A:360:SER:HB2	1:A:365:THR:HG22	1.81	0.62
1:A:55:ASN:O	1:A:56:ILE:HD13	1.98	0.62
1:A:260:ARG:NH2	1:A:267:VAL:HG11	2.15	0.62
1:A:16:GLY:HA3	1:A:22:LYS:HG2	1.80	0.62
1:A:352:ARG:O	1:A:370:VAL:HG21	2.00	0.61
1:A:18:VAL:CG1	1:A:128:GLN:HE22	2.14	0.61
1:A:46:THR:HB	1:A:49:LEU:CD1	2.31	0.61
1:A:51:TYR:CD2	1:A:294:LEU:HG	2.35	0.61
1:A:280:ARG:HB2	1:A:280:ARG:NH1	2.17	0.59
1:A:142:LYS:HE2	1:A:143:ASN:HD21	1.68	0.58
1:A:343:LYS:HB3	1:A:344:GLU:OE1	2.04	0.58
1:A:256:LEU:HA	1:A:257:PRO:C	2.28	0.58
1:A:264:GLN:C	1:A:266:LYS:H	2.11	0.58
1:A:340:VAL:HG13	1:A:345:MET:HG3	1.84	0.57
1:A:69:VAL:HG21	1:A:83:PRO:HG3	1.86	0.57
1:A:30:THR:HG22	1:A:54:THR:OG1	2.05	0.57
1:A:354:LYS:H	1:A:370:VAL:HG23	1.69	0.57
1:A:156:LYS:HD3	2:A:490:HOH:O	2.05	0.57
1:A:228:THR:HG21	1:A:233:LEU:HD23	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:168:GLN:OE1	1:A:171:LYS:HD2	2.05	0.56
1:A:54:THR:HG22	1:A:55:ASN:N	2.20	0.56
1:A:100:LEU:HA	1:A:103:THR:OG1	2.06	0.56
1:A:100:LEU:HD22	1:A:104:MET:HB2	1.88	0.56
1:A:18:VAL:HG13	1:A:128:GLN:HE22	1.72	0.55
1:A:40:GLU:OE2	1:A:45:MET:HG2	2.06	0.55
1:A:264:GLN:HB3	1:A:266:LYS:HE2	1.87	0.55
1:A:7:GLN:HE22	1:A:290:LYS:H	1.55	0.55
1:A:50:GLY:HA3	1:A:93:ASP:OD1	2.07	0.55
1:A:150:LYS:O	1:A:153:VAL:HG22	2.07	0.55
1:A:43:ARG:CD	1:A:280:ARG:HH21	2.14	0.55
1:A:344:GLU:O	1:A:345:MET:CB	2.52	0.55
1:A:281:PHE:HB2	1:A:286:PHE:HE2	1.73	0.54
1:A:231:ASN:ND2	1:A:232:GLU:HG2	2.21	0.54
1:A:8:PRO:HA	1:A:88:ARG:O	2.08	0.54
1:A:124:PHE:CE1	1:A:125:PRO:HB3	2.43	0.54
1:A:316:ILE:HD12	1:A:316:ILE:N	2.22	0.54
1:A:395:THR:HG22	1:A:411:GLY:O	2.08	0.54
1:A:94:ALA:HB2	1:A:100:LEU:HD21	1.90	0.54
1:A:337:GLU:CD	1:A:337:GLU:N	2.53	0.54
1:A:410:TRP:HZ3	1:A:412:LEU:HG	1.73	0.54
1:A:199:GLU:O	1:A:203:LYS:HE3	2.07	0.53
1:A:280:ARG:NH1	1:A:280:ARG:CB	2.72	0.53
1:A:344:GLU:O	1:A:345:MET:HB3	2.08	0.53
1:A:17:HIS:O	1:A:18:VAL:HG13	2.09	0.53
1:A:98:GLU:HG2	1:A:100:LEU:HD12	1.91	0.53
1:A:338:ARG:HH12	1:A:347:LYS:HD3	1.72	0.53
1:A:49:LEU:HD12	1:A:219:ARG:HD2	1.89	0.53
1:A:287:LYS:HG2	1:A:288:GLU:HG3	1.91	0.53
1:A:22:LYS:HB3	1:A:117:VAL:HG11	1.91	0.53
1:A:242:ILE:O	1:A:291:PRO:HA	2.08	0.53
1:A:325:VAL:HA	1:A:386:VAL:O	2.08	0.53
1:A:22:LYS:NZ	1:A:94:ALA:O	2.41	0.52
1:A:47:ILE:C	1:A:49:LEU:H	2.17	0.52
1:A:171:LYS:HA	1:A:176:GLU:OE2	2.10	0.52
1:A:360:SER:HB3	1:A:365:THR:HG22	1.91	0.52
1:A:401:ILE:O	1:A:402:ALA:HB3	2.08	0.52
1:A:155:SER:OG	1:A:157:GLU:HG2	2.09	0.52
1:A:172:GLY:H	1:A:176:GLU:CD	2.17	0.52
1:A:302:ASP:OD1	1:A:304:SER:HB3	2.10	0.52
1:A:383:ARG:HG3	1:A:383:ARG:HH11	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:54:THR:HG21	1:A:70:THR:HB	1.92	0.51
1:A:125:PRO:HG3	1:A:169:PHE:CE2	2.45	0.51
1:A:218:ILE:O	1:A:219:ARG:HG2	2.10	0.51
1:A:100:LEU:HB3	1:A:104:MET:CB	2.34	0.51
1:A:338:ARG:HB2	1:A:346:LEU:O	2.10	0.51
1:A:176:GLU:C	1:A:177:ASN:ND2	2.67	0.51
1:A:54:THR:HG22	1:A:55:ASN:H	1.75	0.51
1:A:217:VAL:HG11	1:A:314:SER:HB2	1.91	0.51
1:A:47:ILE:HG22	1:A:219:ARG:NE	2.22	0.51
1:A:213:PRO:HA	1:A:245:GLY:HA3	1.93	0.50
1:A:215:MET:HA	1:A:242:ILE:HA	1.94	0.50
1:A:3:TRP:CZ2	1:A:83:PRO:HG2	2.46	0.50
1:A:64:LYS:HG2	1:A:67:ALA:HB3	1.94	0.50
1:A:184:SER:CB	1:A:189:ILE:HB	2.37	0.50
1:A:110:LEU:HG	1:A:241:SER:HB3	1.93	0.50
1:A:354:LYS:N	1:A:370:VAL:HG23	2.27	0.49
1:A:325:VAL:O	1:A:325:VAL:HG23	2.11	0.49
1:A:367:LEU:HD23	1:A:367:LEU:H	1.76	0.49
1:A:231:ASN:N	1:A:231:ASN:HD22	2.09	0.49
1:A:415:ILE:OXT	1:A:415:ILE:HG13	2.13	0.49
1:A:224:ASN:HD21	1:A:234:LYS:H	1.59	0.49
1:A:372:SER:HB3	1:A:379:GLU:HB2	1.94	0.49
1:A:124:PHE:CE2	1:A:166:ILE:HA	2.48	0.49
1:A:98:GLU:O	1:A:99:VAL:HB	2.13	0.49
1:A:130:ARG:O	1:A:133:PHE:HB3	2.12	0.48
1:A:25:LEU:O	1:A:29:ILE:HG13	2.13	0.48
1:A:37:HIS:C	1:A:39:GLU:H	2.22	0.48
1:A:280:ARG:HD2	1:A:285:GLU:OE2	2.14	0.48
1:A:346:LEU:HD12	2:A:431:HOH:O	2.12	0.48
1:A:179:PRO:HG3	1:A:201:TYR:CD2	2.48	0.48
1:A:5:LYS:HE3	1:A:286:PHE:CE1	2.48	0.48
1:A:367:LEU:O	1:A:383:ARG:HB2	2.14	0.48
1:A:142:LYS:HE2	1:A:143:ASN:ND2	2.27	0.48
1:A:47:ILE:CG2	1:A:219:ARG:HH21	2.27	0.48
1:A:17:HIS:CE1	1:A:126:GLN:HG3	2.47	0.48
1:A:75:LYS:C	1:A:77:CYS:N	2.71	0.48
1:A:16:GLY:O	1:A:98:GLU:OE1	2.32	0.48
1:A:249:VAL:HA	1:A:276:ILE:CG2	2.44	0.47
1:A:280:ARG:CZ	1:A:280:ARG:HB3	2.45	0.47
1:A:170:THR:HB	1:A:175:ALA:O	2.13	0.47
1:A:14:VAL:HB	1:A:93:ASP:HB3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:228:THR:CG2	1:A:233:LEU:HD23	2.44	0.47
1:A:367:LEU:H	1:A:367:LEU:CD2	2.28	0.47
1:A:160:LEU:O	1:A:164:ARG:HG2	2.15	0.46
1:A:18:VAL:HG13	1:A:128:GLN:NE2	2.29	0.46
1:A:160:LEU:O	1:A:163:TYR:HB3	2.15	0.46
1:A:19:ASP:CA	1:A:96:GLY:HA2	2.45	0.46
1:A:98:GLU:O	1:A:99:VAL:CB	2.63	0.46
1:A:16:GLY:CA	1:A:117:VAL:HG13	2.40	0.46
1:A:11:ASN:OD1	1:A:293:GLY:HA2	2.16	0.46
1:A:32:ILE:HD11	1:A:39:GLU:CG	2.33	0.46
1:A:51:TYR:CE2	1:A:294:LEU:CG	2.91	0.46
1:A:212:LYS:O	1:A:244:GLN:HG3	2.15	0.46
1:A:325:VAL:HG23	1:A:385:PRO:HB2	1.97	0.46
1:A:332:LYS:NZ	2:A:424:HOH:O	2.48	0.46
1:A:213:PRO:CG	1:A:318:LEU:HG	2.45	0.46
1:A:53:GLU:HG3	1:A:88:ARG:NH2	2.31	0.46
1:A:35:SER:O	1:A:36:LYS:HB2	2.15	0.45
1:A:213:PRO:HG2	1:A:318:LEU:HG	1.99	0.45
1:A:359:LEU:N	1:A:359:LEU:HD23	2.32	0.45
1:A:264:GLN:O	1:A:266:LYS:N	2.50	0.45
1:A:399:ARG:HB2	1:A:408:ILE:HD13	1.99	0.45
1:A:338:ARG:HH11	1:A:338:ARG:CB	2.26	0.45
1:A:53:GLU:HG3	1:A:88:ARG:HH21	1.81	0.44
1:A:68:TYR:CE1	1:A:196:GLU:HB2	2.53	0.44
1:A:280:ARG:CB	1:A:280:ARG:CZ	2.96	0.44
1:A:338:ARG:HB3	1:A:338:ARG:CZ	2.46	0.44
1:A:242:ILE:HD11	1:A:291:PRO:HD3	1.99	0.44
1:A:316:ILE:N	1:A:316:ILE:CD1	2.81	0.44
1:A:2:ALA:HA	1:A:82:GLU:OE1	2.18	0.44
1:A:175:ALA:O	1:A:176:GLU:C	2.60	0.44
1:A:170:THR:O	1:A:176:GLU:HA	2.16	0.44
1:A:33:TRP:HZ3	1:A:36:LYS:HZ2	1.66	0.44
1:A:254:LYS:HA	1:A:272:ILE:O	2.18	0.43
1:A:280:ARG:NH2	1:A:282:GLY:O	2.51	0.43
1:A:392:ASN:HB3	1:A:412:LEU:HD22	2.01	0.43
1:A:46:THR:HB	1:A:49:LEU:HD12	2.01	0.43
1:A:131:GLU:O	1:A:134:VAL:HG12	2.19	0.43
1:A:231:ASN:ND2	1:A:231:ASN:C	2.77	0.43
1:A:43:ARG:HB3	1:A:280:ARG:NH2	2.34	0.43
1:A:96:GLY:C	1:A:98:GLU:H	2.26	0.43
1:A:410:TRP:CZ3	1:A:412:LEU:HG	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:GLU:HA	1:A:44:GLY:C	2.43	0.43
1:A:306:THR:O	1:A:307:LYS:C	2.62	0.43
1:A:216:LEU:N	1:A:216:LEU:HD22	2.34	0.43
1:A:153:VAL:HG23	1:A:154:VAL:HG13	2.01	0.42
1:A:332:LYS:HA	1:A:376:ASP:O	2.19	0.42
1:A:242:ILE:O	1:A:242:ILE:HG13	2.19	0.42
1:A:279:ILE:HG21	1:A:289:ALA:HB2	2.00	0.42
1:A:312:LEU:HD12	1:A:312:LEU:C	2.44	0.42
1:A:401:ILE:HG23	1:A:406:ARG:HD3	2.01	0.42
1:A:42:LYS:O	1:A:42:LYS:HG2	2.19	0.42
1:A:106:SER:C	1:A:108:ALA:N	2.77	0.42
1:A:23:THR:HG21	1:A:35:SER:HB2	2.01	0.42
1:A:246:LEU:CD2	1:A:248:LYS:HG3	2.49	0.42
1:A:110:LEU:HG	1:A:241:SER:CB	2.50	0.42
1:A:334:ASN:HB3	2:A:504:HOH:O	2.20	0.41
1:A:26:VAL:HG11	1:A:34:THR:CG2	2.50	0.41
1:A:279:ILE:CG2	1:A:289:ALA:HB2	2.49	0.41
1:A:162:GLN:O	1:A:166:ILE:HG13	2.20	0.41
1:A:326:LEU:O	1:A:382:LEU:HD12	2.21	0.41
1:A:5:LYS:O	1:A:286:PHE:HE1	2.04	0.41
1:A:352:ARG:HG2	1:A:353:ALA:O	2.21	0.41
1:A:375:LYS:HE3	1:A:376:ASP:OD1	2.20	0.41
1:A:313:GLY:HA2	1:A:363:SER:O	2.21	0.41
1:A:18:VAL:HG12	1:A:97:HIS:CD2	2.55	0.41
1:A:287:LYS:CD	1:A:287:LYS:N	2.84	0.41
1:A:331:ILE:O	1:A:377:GLU:HA	2.21	0.41
1:A:18:VAL:HG12	1:A:97:HIS:HD2	1.85	0.41
1:A:290:LYS:HB3	1:A:291:PRO:HD2	2.03	0.41
1:A:315:ILE:C	1:A:316:ILE:HD12	2.46	0.40
1:A:75:LYS:O	1:A:77:CYS:N	2.54	0.40
1:A:357:LEU:O	1:A:367:LEU:HB2	2.20	0.40
1:A:142:LYS:H	1:A:142:LYS:HG2	1.64	0.40
1:A:175:ALA:O	1:A:178:VAL:HG22	2.21	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	412/414 (100%)	358 (87%)	44 (11%)	10 (2%)	4 18

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	22	LYS
1	A	32	ILE
1	A	98	GLU
1	A	99	VAL
1	A	96	GLY
1	A	142	LYS
1	A	43	ARG
1	A	19	ASP
1	A	44	GLY
1	A	265	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	A	356/356 (100%)	321 (90%)	35 (10%)	7 25

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	9	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	10	VAL
1	A	20	HIS
1	A	33	TRP
1	A	53	GLU
1	A	61	SER
1	A	63	LYS
1	A	71	GLU
1	A	95	PRO
1	A	97	HIS
1	A	117	VAL
1	A	126	GLN
1	A	134	VAL
1	A	139	ILE
1	A	141	VAL
1	A	186	LEU
1	A	194	LEU
1	A	207	ARG
1	A	211	GLN
1	A	217	VAL
1	A	223	VAL
1	A	231	ASN
1	A	242	ILE
1	A	243	ILE
1	A	270	GLU
1	A	287	LYS
1	A	311	LEU
1	A	325	VAL
1	A	326	LEU
1	A	336	LEU
1	A	337	GLU
1	A	343	LYS
1	A	359	LEU
1	A	366	THR
1	A	406	ARG

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

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	7	GLN
1	A	17	HIS
1	A	55	ASN
1	A	97	HIS

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Mol	Chain	Res	Type
1	A	126	GLN
1	A	128	GLN
1	A	143	ASN
1	A	165	GLN
1	A	177	ASN
1	A	187	HIS
1	A	190	ASN
1	A	211	GLN
1	A	224	ASN
1	A	229	GLN
1	A	231	ASN
1	A	310	ASN
1	A	400	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	414/414 (100%)	0.25	35 (8%) <b>16</b> <b>14</b>	29, 50, 122, 165	0

All (35) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	35	SER	6.5
1	A	99	VAL	5.8
1	A	41	LEU	5.3
1	A	47	ILE	5.2
1	A	46	THR	5.1
1	A	100	LEU	4.7
1	A	37	HIS	4.5
1	A	51	TYR	4.2
1	A	36	LYS	4.2
1	A	102	ALA	3.7
1	A	39	GLU	3.7
1	A	33	TRP	3.4
1	A	42	LYS	3.4
1	A	44	GLY	3.4
1	A	43	ARG	3.3
1	A	38	SER	3.1
1	A	34	THR	3.1
1	A	45	MET	3.1
1	A	17	HIS	2.9
1	A	50	GLY	2.8
1	A	267	VAL	2.7
1	A	32	ILE	2.7
1	A	109	ALA	2.6
1	A	97	HIS	2.6
1	A	345	MET	2.4
1	A	342	ALA	2.4
1	A	18	VAL	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	49	LEU	2.3
1	A	142	LYS	2.2
1	A	346	LEU	2.2
1	A	98	GLU	2.2
1	A	101	MET	2.1
1	A	96	GLY	2.0
1	A	19	ASP	2.0
1	A	344	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 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.