



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 7, 2023 – 09:58 PM EDT

PDB ID : 1NUD
Title : Role of Calcium Ions in the Activation and Activity of the Transglutaminase 3 Enzyme (3 calciums, active form)
Authors : Ahvazi, B.
Deposited on : 2003-01-31
Resolution : 2.70 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
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35

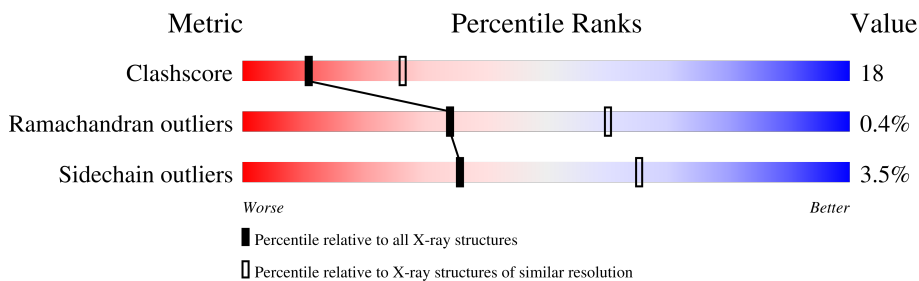
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	692	
1	B	692	

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 10921 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-glutamine glutamyltransferase E.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	673	5250	3313	913	1001	23	0	0	0
1	B	673	5250	3313	913	1001	23	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	250	ASP	ASN	SEE REMARK 999	UNP Q08188
A	264	LEU	PHE	engineered mutation	UNP Q08188
A	561	ARG	LYS	SEE REMARK 999	UNP Q08188
A	653	ARG	GLY	SEE REMARK 999	UNP Q08188
B	250	ASP	ASN	SEE REMARK 999	UNP Q08188
B	264	LEU	PHE	engineered mutation	UNP Q08188
B	561	ARG	LYS	SEE REMARK 999	UNP Q08188
B	653	ARG	GLY	SEE REMARK 999	UNP Q08188

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total 3	Ca 3	0	0
2	B	3	Total 3	Ca 3	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	4	Total 4	Cl 4	0	0
3	B	4	Total 4	Cl 4	0	0

- Molecule 4 is BROMIDE ION (three-letter code: BR) (formula: Br).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	4	Total 4	Br 4	0	0
4	B	5	Total 5	Br 5	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	193	Total 193	O 193	0	0
5	B	205	Total 205	O 205	0	0

4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	57.54Å 115.37Å 121.39Å 90.00° 92.66° 90.00°	Depositor
Resolution (Å)	20.00 – 2.70	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-2.70)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.199 , 0.265	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	10921	wwPDB-VP
Average B, all atoms (Å ²)	20.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BR, CL, 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	A	0.37	0/5360	0.62	0/7270
1	B	0.35	0/5360	0.62	0/7270
All	All	0.36	0/10720	0.62	0/14540

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	5250	0	5194	169	0
1	B	5250	0	5194	212	0
2	A	3	0	0	0	0
2	B	3	0	0	0	0
3	A	4	0	0	0	0
3	B	4	0	0	1	0
4	A	4	0	0	1	0
4	B	5	0	0	2	0
5	A	193	0	0	9	0
5	B	205	0	0	11	0
All	All	10921	0	10388	381	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 18.

All (381) 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:576:LYS:HD3	1:A:582:GLU:HG3	1.35	1.08
1:B:448:GLU:HG3	1:B:449:ARG:HD2	1.47	0.94
1:A:611:ASN:HB3	1:A:657:ARG:NH2	1.82	0.92
1:B:611:ASN:HD22	1:B:657:ARG:HH22	1.21	0.89
1:A:82:GLY:HA2	1:A:102:PRO:HB3	1.54	0.88
1:A:138:LEU:HD22	1:A:140:VAL:HG22	1.55	0.88
1:B:75:LEU:HD11	1:B:87:LEU:HB2	1.56	0.85
1:A:141:ASP:OD2	1:A:143:VAL:HG22	1.76	0.84
1:A:586:GLU:HB2	4:B:712:BR:BR	2.33	0.84
1:B:82:GLY:HA2	1:B:102:PRO:HB3	1.58	0.84
1:A:555:SER:H	1:A:558:GLN:HE21	1.22	0.83
1:B:459:LEU:O	1:B:460:LYS:HD2	1.78	0.83
1:B:623:PRO:HB3	1:B:649:GLY:HA2	1.59	0.83
1:B:570:ARG:HD3	1:B:588:ASP:OD1	1.79	0.82
1:A:657:ARG:HB3	1:A:657:ARG:NH1	1.95	0.81
1:B:563:LEU:HD11	1:B:567:ASN:HA	1.62	0.81
1:B:440:LYS:HE2	1:B:443:GLU:OE2	1.80	0.81
1:A:611:ASN:HB3	1:A:657:ARG:HH21	1.44	0.80
1:B:235:ASN:ND2	1:B:237:SER:H	1.80	0.80
1:B:611:ASN:HB3	1:B:657:ARG:HH12	1.47	0.78
1:A:629:LEU:HD23	1:A:630:MET:N	2.00	0.77
1:B:139:ASN:HD22	1:B:140:VAL:N	1.83	0.77
1:B:380:GLN:HG2	5:B:849:HOH:O	1.84	0.77
1:B:520:ALA:HB3	1:B:534:TRP:HB3	1.68	0.76
1:A:139:ASN:OD1	1:A:140:VAL:HG13	1.86	0.75
1:A:65:GLU:OE1	1:A:70:LYS:HD3	1.86	0.75
1:A:289:PRO:HB2	1:A:336:TRP:HB3	1.69	0.75
1:B:363:VAL:HG12	1:B:365:GLN:HG2	1.70	0.74
1:A:637:LEU:HD21	1:A:660:ILE:HG22	1.71	0.73
1:B:606:VAL:HG23	1:B:691:ALA:O	1.87	0.73
1:A:607:ARG:HH11	1:A:607:ARG:HB2	1.54	0.72
1:A:380:GLN:HG3	1:A:458:LYS:HD3	1.71	0.71
1:B:214:TYR:O	1:B:218:VAL:HG23	1.91	0.71
1:A:691:ALA:O	1:A:692:GLU:HB2	1.91	0.71
1:B:102:PRO:HG2	1:B:105:ALA:HB2	1.73	0.70
1:B:449:ARG:O	1:B:453:GLN:HG2	1.91	0.70
1:B:138:LEU:HD22	1:B:140:VAL:HG22	1.74	0.70

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:570:ARG:HD3	1:A:588:ASP:OD1	1.92	0.70
1:A:23:LYS:HE3	1:A:180:PHE:CE2	2.27	0.69
1:B:446:ASP:O	1:B:450:GLN:HB2	1.91	0.69
1:B:606:VAL:CG2	1:B:665:SER:HB3	2.22	0.69
1:B:68:MET:HB2	5:B:737:HOH:O	1.92	0.68
1:A:114:LEU:HB2	1:A:127:LEU:HD11	1.74	0.68
1:A:280:ASN:HB2	1:A:333:ASN:HD21	1.57	0.68
1:B:12:THR:O	1:B:13:ALA:HB2	1.94	0.68
1:B:6:GLN:HE21	1:B:44:ASN:HA	1.60	0.67
1:A:299:ALA:HB1	1:A:308:VAL:HG11	1.75	0.67
1:A:602:ASN:HD21	1:A:611:ASN:H	1.43	0.66
1:A:280:ASN:HB2	1:A:333:ASN:ND2	2.10	0.66
1:A:342:LEU:HD22	1:A:381:LEU:HD13	1.76	0.66
1:B:657:ARG:HG2	1:B:657:ARG:HH11	1.58	0.66
1:A:607:ARG:HB2	1:A:607:ARG:NH1	2.11	0.66
1:A:56:ILE:HG12	1:A:72:VAL:HG22	1.77	0.65
1:A:138:LEU:CD2	1:A:140:VAL:HG22	2.26	0.65
1:B:602:ASN:HD21	1:B:611:ASN:H	1.43	0.65
1:A:375:ARG:HG3	1:A:440:LYS:HA	1.78	0.65
1:A:19:HIS:O	1:A:21:THR:HG23	1.98	0.64
1:B:139:ASN:HD22	1:B:140:VAL:H	1.43	0.64
1:B:313:ASP:OD2	1:B:317:ASN:HB2	1.96	0.64
1:B:611:ASN:HB3	1:B:657:ARG:NH1	2.12	0.64
1:A:613:GLN:OE1	1:A:655:ARG:HD3	1.98	0.64
1:B:36:ASN:HB2	1:B:99:ILE:O	1.98	0.64
1:B:244:ARG:HD2	5:B:839:HOH:O	1.98	0.64
1:A:196:LEU:HG	1:A:228:ASP:HB3	1.79	0.63
1:A:629:LEU:HD22	1:A:631:VAL:HG23	1.80	0.63
1:B:611:ASN:ND2	1:B:657:ARG:HH22	1.94	0.63
1:A:29:LEU:HD23	1:A:130:PHE:HB3	1.80	0.63
1:B:629:LEU:HD22	1:B:631:VAL:HG23	1.81	0.63
1:A:555:SER:H	1:A:558:GLN:NE2	1.96	0.62
1:A:210:ASN:HD22	1:A:210:ASN:H	1.47	0.62
1:A:334:GLU:HA	1:A:350:GLN:O	2.00	0.61
1:B:542:LEU:HD21	1:B:548:ALA:HB2	1.81	0.61
1:B:134:PHE:HB3	1:B:143:VAL:HG21	1.82	0.61
1:B:107:ILE:HD13	1:B:134:PHE:CE2	2.36	0.61
1:A:299:ALA:HB2	1:A:418:ILE:HD13	1.83	0.60
1:A:378:ASP:HB3	5:A:806:HOH:O	2.01	0.60
1:B:637:LEU:HD21	1:B:660:ILE:HG22	1.83	0.60
1:A:235:ASN:ND2	1:A:237:SER:H	2.00	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:235:ASN:HD22	1:B:237:SER:H	1.49	0.59
1:B:611:ASN:HD22	1:B:657:ARG:NH2	1.96	0.59
1:A:484:GLY:HA2	1:A:503:LEU:O	2.02	0.59
1:B:12:THR:O	1:B:13:ALA:CB	2.49	0.59
1:B:601:LEU:HD21	1:B:613:GLN:HG2	1.83	0.59
1:A:102:PRO:HG2	1:A:105:ALA:HB2	1.84	0.59
1:A:416:HIS:HA	1:A:443:GLU:OE1	2.03	0.59
1:A:54:GLU:HB2	1:A:115:GLN:HB3	1.84	0.58
1:A:599:GLU:O	1:A:612:VAL:HG13	2.03	0.58
1:A:382:ASN:HB3	1:A:383:PHE:CG	2.38	0.58
1:B:488:VAL:HG22	1:B:500:LEU:HD11	1.85	0.58
1:A:58:SER:HB2	1:A:63:PRO:HB3	1.86	0.58
1:A:576:LYS:CD	1:A:582:GLU:HG3	2.22	0.58
1:B:382:ASN:HB3	1:B:383:PHE:CG	2.39	0.58
1:A:602:ASN:ND2	1:A:611:ASN:H	2.02	0.58
1:B:235:ASN:HD22	1:B:236:TRP:N	2.02	0.57
1:B:606:VAL:HG21	1:B:665:SER:HB3	1.84	0.57
1:A:459:LEU:O	1:A:460:LYS:HD2	2.04	0.57
1:B:42:ILE:HG12	1:B:94:THR:OG1	2.03	0.57
1:A:513:THR:O	1:A:578:PRO:HD3	2.05	0.57
1:A:488:VAL:HA	1:A:500:LEU:HD23	1.87	0.57
1:B:484:GLY:HA2	1:B:503:LEU:O	2.04	0.57
1:B:627:CYS:HB2	1:B:645:VAL:HB	1.86	0.57
1:A:42:ILE:HG12	1:A:94:THR:OG1	2.04	0.57
1:A:78:GLY:O	1:A:86:VAL:HG22	2.05	0.57
1:A:502:LEU:HD11	1:A:504:LEU:HD21	1.84	0.57
1:A:676:CYS:SG	1:A:679:PHE:HB2	2.44	0.56
1:B:228:ASP:O	1:B:229:ASN:HB2	2.04	0.56
1:B:211:ASP:CG	1:B:213:LYS:HZ2	2.09	0.56
1:B:259:TRP:CZ2	1:B:264:LEU:HD22	2.40	0.56
1:A:482:ILE:HD13	1:A:577:VAL:HG21	1.87	0.56
1:A:657:ARG:HB3	1:A:657:ARG:CZ	2.35	0.56
1:A:544:PRO:O	1:A:545:GLU:HB2	2.06	0.56
1:B:526:ASN:ND2	1:B:528:THR:H	2.03	0.56
1:A:259:TRP:CH2	1:A:264:LEU:HD22	2.40	0.55
1:A:630:MET:O	1:A:672:ALA:HA	2.06	0.55
1:B:586:GLU:HB3	5:B:858:HOH:O	2.05	0.55
1:A:459:LEU:C	1:A:460:LYS:HD2	2.25	0.55
1:B:488:VAL:HA	1:B:500:LEU:HD12	1.89	0.55
1:B:613:GLN:HA	1:B:656:VAL:O	2.06	0.55
1:A:306:LEU:HD13	1:A:459:LEU:HD12	1.88	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:524:ILE:HB	1:A:526:ASN:OD1	2.06	0.55
1:B:169:ARG:HD2	1:B:590:ILE:HB	1.88	0.55
1:A:607:ARG:HH11	1:A:607:ARG:CB	2.20	0.55
1:B:268:ARG:HB3	1:B:269:TYR:CD2	2.42	0.55
1:A:629:LEU:HD23	1:A:630:MET:H	1.72	0.55
1:B:617:SER:O	1:B:619:PRO:HD3	2.07	0.55
1:A:52:ARG:HB3	1:A:117:PHE:HB2	1.88	0.54
1:A:217:ARG:NH2	1:A:365:GLN:NE2	2.55	0.54
1:B:532:GLU:OE1	1:B:535:LYS:HE3	2.08	0.54
1:A:19:HIS:CE1	1:A:35:GLN:HB3	2.41	0.54
1:A:54:GLU:HB2	1:A:115:GLN:HE21	1.72	0.54
1:B:615:LEU:CD2	1:B:655:ARG:HG2	2.37	0.54
1:A:629:LEU:CD2	1:A:631:VAL:HG23	2.37	0.54
1:B:206:VAL:HA	1:B:209:ARG:HD2	1.89	0.54
1:B:417:THR:HG23	1:B:418:ILE:HD12	1.89	0.54
1:A:657:ARG:HD3	5:A:841:HOH:O	2.07	0.54
1:B:65:GLU:HA	1:B:70:LYS:O	2.07	0.54
1:A:657:ARG:HB3	1:A:657:ARG:HH11	1.69	0.54
1:A:9:ASN:HB3	1:A:40:LEU:HB2	1.90	0.53
1:A:44:ASN:OD1	1:A:45:LYS:HG2	2.08	0.53
1:B:520:ALA:CB	1:B:534:TRP:HB3	2.36	0.53
1:B:37:PHE:CD1	1:B:37:PHE:N	2.76	0.53
1:A:622:GLU:OE1	1:A:678:LYS:HE2	2.08	0.53
1:A:183:ASP:O	1:A:187:ILE:HG13	2.09	0.53
1:B:53:LEU:CD2	1:B:116:ILE:HG12	2.38	0.53
1:B:610:VAL:HG13	1:B:660:ILE:CG1	2.39	0.53
1:A:447:GLN:OE1	1:A:447:GLN:N	2.30	0.53
1:A:64:SER:HB3	1:A:67:ALA:HB3	1.90	0.53
1:B:169:ARG:HH11	1:B:590:ILE:HB	1.74	0.53
1:B:235:ASN:HD21	1:B:237:SER:CB	2.22	0.52
1:B:139:ASN:ND2	1:B:140:VAL:HG13	2.25	0.52
1:B:524:ILE:HA	1:B:566:ASP:OD2	2.09	0.52
1:A:612:VAL:HG12	1:A:613:GLN:N	2.24	0.52
1:B:382:ASN:HB3	1:B:383:PHE:CD2	2.45	0.52
1:B:664:ARG:HD2	1:B:668:LYS:NZ	2.25	0.52
1:B:451:VAL:HB	5:B:746:HOH:O	2.09	0.52
1:B:497:GLU:HG3	1:B:499:ASN:ND2	2.24	0.52
1:B:139:ASN:ND2	1:B:140:VAL:N	2.56	0.52
1:B:497:GLU:HG3	1:B:499:ASN:HD21	1.75	0.52
1:A:318:PRO:HG2	1:A:570:ARG:HG2	1.91	0.52
1:B:515:THR:HG22	1:B:539:THR:OG1	2.10	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:174:GLY:HA3	1:A:671:LEU:HD21	1.92	0.51
1:B:560:GLU:HG3	1:B:561:ARG:N	2.25	0.51
1:A:235:ASN:HD22	1:A:236:TRP:N	2.09	0.51
1:A:360:SER:HB3	1:A:365:GLN:HG3	1.92	0.51
1:A:627:CYS:CB	1:A:645:VAL:HB	2.40	0.51
1:A:83:TRP:HA	1:A:100:SER:O	2.10	0.51
1:B:657:ARG:HH11	1:B:657:ARG:CG	2.23	0.51
1:B:491:MET:HG2	1:B:496:LYS:HE2	1.93	0.51
1:B:36:ASN:H	1:B:36:ASN:ND2	2.08	0.51
1:A:631:VAL:CG1	1:A:670:LEU:HD11	2.41	0.51
1:B:19:HIS:O	1:B:21:THR:HG23	2.11	0.50
1:B:167:THR:HG21	1:B:297:ASN:ND2	2.25	0.50
1:B:679:PHE:HB3	1:B:682:ILE:HD11	1.94	0.50
1:B:169:ARG:HG2	4:B:708:BR:BR	2.66	0.50
1:B:303:ASP:HB3	1:B:305:ASN:ND2	2.26	0.50
3:B:706:CL:CL	5:B:824:HOH:O	2.57	0.50
1:B:34:GLY:HA3	1:B:138:LEU:HD12	1.94	0.50
1:B:164:VAL:HG12	1:B:329:PHE:CZ	2.47	0.50
1:A:296:PHE:O	1:A:297:ASN:HB2	2.11	0.50
1:B:268:ARG:HB3	1:B:269:TYR:CE2	2.46	0.50
1:A:163:PHE:CZ	1:A:432:ARG:HA	2.47	0.50
1:B:252:SER:HB3	1:B:278:THR:HA	1.94	0.50
1:B:511:THR:O	1:B:512:LYS:HD3	2.12	0.50
1:A:259:TRP:CZ2	1:A:264:LEU:HD22	2.47	0.50
1:B:67:ALA:O	1:B:68:MET:HB2	2.12	0.49
1:B:313:ASP:OD1	1:B:315:MET:N	2.45	0.49
1:B:488:VAL:HA	1:B:500:LEU:CD1	2.42	0.49
1:A:380:GLN:HE22	1:A:381:LEU:HG	1.77	0.49
1:A:627:CYS:HB2	1:A:645:VAL:HB	1.94	0.49
1:A:612:VAL:HG12	1:A:613:GLN:H	1.78	0.49
1:B:161:ILE:HB	1:B:425:LYS:HD2	1.94	0.49
1:A:342:LEU:HD22	1:A:381:LEU:HD22	1.95	0.49
1:A:380:GLN:HE21	1:A:380:GLN:C	2.15	0.49
1:B:610:VAL:HG13	1:B:660:ILE:HG12	1.94	0.49
1:A:23:LYS:NZ	5:A:738:HOH:O	2.46	0.49
1:A:231:VAL:HA	1:A:259:TRP:CD1	2.48	0.49
1:A:511:THR:HB	1:B:607:ARG:NH2	2.28	0.49
1:B:629:LEU:CD2	1:B:631:VAL:HG23	2.43	0.49
1:A:601:LEU:HD11	1:A:613:GLN:NE2	2.28	0.49
1:B:217:ARG:NH2	1:B:365:GLN:NE2	2.61	0.49
1:A:576:LYS:HD3	1:A:582:GLU:CG	2.25	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:5:VAL:CG2	1:A:114:LEU:HD23	2.42	0.48
1:A:564:LYS:C	1:A:566:ASP:H	2.17	0.48
1:B:106:PRO:HG3	1:B:210:ASN:HB3	1.95	0.48
1:A:247:ARG:HG2	1:A:273:TRP:CZ2	2.48	0.48
1:B:673:ASP:OD1	1:B:683:LYS:HE3	2.14	0.48
1:B:6:GLN:NE2	1:B:44:ASN:HA	2.27	0.48
1:B:506:ASN:O	1:B:545:GLU:HA	2.13	0.48
1:A:107:ILE:HD13	1:A:134:PHE:CE2	2.49	0.48
1:A:210:ASN:H	1:A:210:ASN:ND2	2.11	0.48
1:B:405:THR:OG1	1:B:407:LYS:HB2	2.14	0.48
1:B:599:GLU:O	1:B:612:VAL:HG13	2.14	0.48
1:A:361:GLN:NE2	5:A:747:HOH:O	2.46	0.47
1:B:63:PRO:HB3	1:B:70:LYS:HB2	1.96	0.47
1:B:77:ASN:HA	1:B:86:VAL:HG13	1.95	0.47
1:B:196:LEU:HG	1:B:228:ASP:HB3	1.96	0.47
1:B:289:PRO:HB2	1:B:336:TRP:HB3	1.95	0.47
1:A:360:SER:O	1:A:361:GLN:HB2	2.15	0.47
1:B:59:THR:HA	5:B:853:HOH:O	2.13	0.47
1:B:163:PHE:CZ	1:B:432:ARG:HA	2.49	0.47
1:B:330:HIS:CD2	1:B:332:TRP:HE3	2.32	0.47
1:B:359:ARG:NH1	1:B:362:GLY:O	2.46	0.47
1:B:543:ASP:O	1:B:546:GLU:HB3	2.14	0.47
1:A:544:PRO:O	1:A:545:GLU:CB	2.62	0.47
1:A:315:MET:O	1:A:517:ASN:HB3	2.13	0.47
1:A:635:GLY:HA3	1:A:668:LYS:HE2	1.97	0.47
1:B:503:LEU:HD23	1:B:549:GLU:HG2	1.96	0.47
1:B:235:ASN:HD22	1:B:235:ASN:C	2.17	0.47
1:B:151:ARG:HG2	1:B:151:ARG:HH11	1.79	0.47
1:A:138:LEU:HD22	1:A:140:VAL:H	1.80	0.47
1:A:266:PRO:HB2	5:A:797:HOH:O	2.13	0.47
4:A:711:BR:BR	1:B:38:GLN:HB2	2.70	0.47
1:B:607:ARG:NH1	1:B:607:ARG:HB2	2.30	0.47
1:A:206:VAL:HA	1:A:209:ARG:HD2	1.97	0.47
1:A:482:ILE:N	1:A:482:ILE:HD12	2.29	0.47
1:B:615:LEU:HD21	1:B:655:ARG:HG2	1.96	0.47
1:A:382:ASN:HA	1:A:383:PHE:HA	1.67	0.46
1:B:396:ARG:HB2	1:B:418:ILE:HD13	1.97	0.46
1:A:312:TYR:CE2	1:A:572:THR:HG21	2.50	0.46
1:B:317:ASN:OD1	1:B:519:THR:HG21	2.15	0.46
1:A:268:ARG:HA	1:A:269:TYR:HA	1.69	0.46
1:B:154:TYR:CE1	1:B:291:ARG:HD3	2.51	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:664:ARG:HD2	1:B:668:LYS:HZ3	1.80	0.46
1:B:252:SER:CB	1:B:278:THR:HA	2.45	0.46
1:A:500:LEU:HD13	1:A:571:ILE:HG13	1.97	0.46
1:A:447:GLN:H	1:A:447:GLN:CD	2.17	0.46
1:B:382:ASN:HA	1:B:383:PHE:HA	1.69	0.46
1:A:247:ARG:HG2	1:A:273:TRP:CH2	2.51	0.46
1:A:53:LEU:HD22	1:A:116:ILE:HG12	1.96	0.46
1:A:435:VAL:O	1:A:438:LYS:HB2	2.16	0.46
1:B:303:ASP:CB	1:B:305:ASN:ND2	2.79	0.46
1:B:492:LEU:HD13	1:B:589:ILE:HB	1.98	0.45
1:B:570:ARG:HA	1:B:588:ASP:OD1	2.16	0.45
1:B:597:THR:HG22	1:B:598:LEU:N	2.30	0.45
1:A:139:ASN:HA	1:A:144:PHE:CG	2.51	0.45
1:B:250:ASP:HB2	1:B:632:GLU:OE2	2.15	0.45
1:A:139:ASN:HA	1:A:144:PHE:CD1	2.52	0.45
1:A:169:ARG:NH2	1:A:592:ASP:OD1	2.50	0.45
1:A:43:MET:O	1:A:93:ASN:HB3	2.15	0.45
1:B:247:ARG:NH1	1:B:566:ASP:OD1	2.50	0.45
1:B:492:LEU:CD1	1:B:589:ILE:HB	2.46	0.45
1:A:570:ARG:NH2	1:A:588:ASP:OD2	2.50	0.45
1:B:234:GLY:HA2	1:B:270:GLY:O	2.16	0.45
1:B:563:LEU:CD1	1:B:567:ASN:HA	2.42	0.45
1:A:502:LEU:CD2	1:A:516:VAL:HG11	2.47	0.45
1:B:36:ASN:CB	1:B:99:ILE:O	2.64	0.45
1:B:206:VAL:HA	1:B:209:ARG:CD	2.46	0.45
1:B:415:SER:HB2	1:B:449:ARG:NH1	2.31	0.45
1:A:653:ARG:NE	5:A:792:HOH:O	2.50	0.45
1:B:58:SER:HB2	1:B:63:PRO:CG	2.47	0.44
1:B:318:PRO:HD2	1:B:521:TRP:CD1	2.52	0.44
1:B:268:ARG:HA	1:B:269:TYR:HA	1.66	0.44
1:B:385:MET:O	1:B:386:PRO:C	2.54	0.44
1:B:405:THR:C	1:B:407:LYS:H	2.20	0.44
1:B:491:MET:CG	1:B:496:LYS:HE2	2.46	0.44
1:B:500:LEU:HD22	1:B:571:ILE:HG13	1.99	0.44
1:A:42:ILE:HA	1:A:94:THR:HA	1.99	0.44
1:A:420:ARG:HG2	5:A:735:HOH:O	2.17	0.44
1:B:213:LYS:HB2	1:B:213:LYS:NZ	2.32	0.44
1:B:535:LYS:O	1:B:536:ASP:HB2	2.17	0.44
1:B:645:VAL:HG12	5:B:875:HOH:O	2.16	0.44
1:A:55:PHE:O	1:A:72:VAL:HA	2.17	0.44
1:B:563:LEU:HD11	1:B:567:ASN:CA	2.43	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:612:VAL:HG12	1:B:613:GLN:N	2.31	0.44
1:A:158:ASP:HA	1:A:179:GLN:OE1	2.17	0.44
1:A:228:ASP:O	1:A:229:ASN:HB2	2.18	0.44
1:B:34:GLY:HA3	1:B:138:LEU:CD1	2.47	0.44
1:B:229:ASN:HD22	1:B:229:ASN:HA	1.58	0.44
1:A:448:GLU:OE2	1:A:449:ARG:NE	2.47	0.44
1:A:564:LYS:O	1:A:566:ASP:N	2.50	0.44
1:B:213:LYS:HZ2	1:B:213:LYS:HB2	1.81	0.44
1:B:402:ASP:OD1	1:B:404:THR:N	2.51	0.44
1:A:370:SER:O	1:A:374:VAL:HG23	2.18	0.44
1:B:544:PRO:C	1:B:546:GLU:H	2.20	0.44
1:A:25:SER:OG	1:A:182:GLU:HG2	2.18	0.44
1:B:417:THR:HG23	1:B:418:ILE:CD1	2.46	0.43
1:B:646:PRO:HG2	5:B:875:HOH:O	2.17	0.43
1:B:53:LEU:HD22	1:B:116:ILE:HG12	2.00	0.43
1:B:679:PHE:CB	1:B:682:ILE:HD11	2.48	0.43
1:A:235:ASN:HD22	1:A:235:ASN:C	2.20	0.43
1:B:224:ASN:O	1:B:230:GLY:HA3	2.17	0.43
1:B:396:ARG:HH22	1:B:586:GLU:CD	2.21	0.43
1:B:524:ILE:HB	1:B:526:ASN:ND2	2.32	0.43
1:B:526:ASN:N	1:B:526:ASN:HD22	2.16	0.43
1:B:73:PHE:CD1	1:B:73:PHE:N	2.86	0.43
1:B:363:VAL:CG1	1:B:364:PHE:N	2.81	0.43
1:B:502:LEU:HG	1:B:504:LEU:HD13	1.99	0.43
1:B:62:TYR:O	1:B:63:PRO:C	2.57	0.43
1:B:259:TRP:CH2	1:B:264:LEU:HD22	2.53	0.43
1:A:377:GLY:O	1:A:454:LYS:HE2	2.19	0.43
1:A:382:ASN:HB3	1:A:383:PHE:CD2	2.53	0.43
1:A:182:GLU:O	1:A:257:LYS:HE2	2.19	0.43
1:A:221:ALA:HB2	1:A:365:GLN:HB3	2.00	0.43
1:A:564:LYS:C	1:A:566:ASP:N	2.72	0.43
1:B:245:ASP:OD1	1:B:565:SER:HB3	2.19	0.43
1:B:154:TYR:CD1	1:B:291:ARG:HB3	2.54	0.43
1:A:306:LEU:CD1	1:A:459:LEU:HD12	2.49	0.42
1:B:296:PHE:O	1:B:297:ASN:HB2	2.19	0.42
1:B:601:LEU:N	1:B:601:LEU:HD22	2.34	0.42
1:A:190:SER:O	1:A:194:ARG:HG2	2.18	0.42
1:B:651:LYS:HE3	5:B:790:HOH:O	2.20	0.42
1:B:380:GLN:HG3	1:B:458:LYS:HD3	2.00	0.42
1:B:503:LEU:O	1:B:504:LEU:HD12	2.19	0.42
1:B:526:ASN:HD21	1:B:528:THR:HB	1.83	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:311:TYR:CD2	1:B:399:TRP:HB2	2.54	0.42
1:B:622:GLU:OE1	1:B:678:LYS:HD2	2.20	0.42
1:B:138:LEU:CD2	1:B:140:VAL:HG22	2.45	0.42
1:A:161:ILE:HG13	1:A:430:ASN:OD1	2.20	0.42
1:A:520:ALA:HB3	1:A:534:TRP:HB3	2.02	0.42
1:A:401:TYR:HD2	1:A:408:GLN:HB2	1.84	0.42
1:A:621:ASP:OD1	1:A:651:LYS:NZ	2.53	0.42
1:B:179:GLN:HA	1:B:184:ILE:HG21	2.01	0.42
1:A:225:SER:HA	1:A:230:GLY:CA	2.50	0.42
1:A:416:HIS:HD1	1:A:443:GLU:HB3	1.84	0.42
1:A:448:GLU:HG3	1:A:449:ARG:N	2.35	0.42
1:B:313:ASP:OD1	1:B:313:ASP:C	2.58	0.42
1:A:34:GLY:HA3	1:A:138:LEU:CD1	2.50	0.42
1:B:602:ASN:HD21	1:B:610:VAL:HA	1.84	0.41
1:A:53:LEU:CD2	1:A:116:ILE:HG12	2.50	0.41
1:B:105:ALA:HA	1:B:106:PRO:HD3	1.93	0.41
1:B:582:GLU:N	1:B:582:GLU:OE1	2.54	0.41
1:A:318:PRO:HD2	1:A:521:TRP:CD1	2.56	0.41
1:A:510:ASP:C	1:A:544:PRO:HG3	2.41	0.41
1:B:337:PHE:CE1	1:B:350:GLN:HG3	2.55	0.41
1:B:448:GLU:OE1	1:B:449:ARG:NH1	2.54	0.41
1:B:657:ARG:NH1	1:B:657:ARG:CG	2.83	0.41
1:B:36:ASN:ND2	1:B:36:ASN:N	2.67	0.41
1:B:36:ASN:N	1:B:36:ASN:HD22	2.17	0.41
1:B:208:SER:C	1:B:210:ASN:H	2.24	0.41
1:B:272:CYS:HG	1:B:525:TYR:HH	1.62	0.41
1:B:293:ILE:O	1:B:331:VAL:HG13	2.21	0.41
1:B:295:ASN:O	1:B:329:PHE:HA	2.21	0.41
1:B:512:LYS:NZ	1:B:580:GLU:OE2	2.54	0.41
1:A:311:TYR:CD2	1:A:399:TRP:HB2	2.56	0.41
1:A:528:THR:HA	5:A:870:HOH:O	2.20	0.41
1:B:137:TRP:CD2	1:B:151:ARG:HD2	2.56	0.41
1:B:357:GLN:HE21	1:B:357:GLN:HB2	1.67	0.41
1:B:510:ASP:C	1:B:544:PRO:HG3	2.40	0.41
1:B:602:ASN:ND2	1:B:611:ASN:H	2.13	0.41
1:A:359:ARG:HD3	1:A:362:GLY:O	2.20	0.41
1:A:630:MET:HB3	1:A:640:ASN:HD21	1.85	0.41
1:B:168:ASN:HD22	1:B:168:ASN:HA	1.63	0.41
1:A:195:SER:HA	1:A:222:MET:SD	2.61	0.41
1:B:327:TRP:CD1	1:B:327:TRP:N	2.89	0.41
1:B:611:ASN:ND2	1:B:657:ARG:NH2	2.63	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:240:TYR:CG	1:A:246:PRO:HD3	2.56	0.41
1:B:111:THR:HG22	5:B:864:HOH:O	2.21	0.41
1:B:448:GLU:HG3	1:B:449:ARG:N	2.35	0.41
1:B:625:ARG:O	1:B:626:ASP:HB2	2.20	0.41
1:B:515:THR:HG22	1:B:539:THR:HG23	2.03	0.40
1:A:114:LEU:O	1:A:124:SER:HA	2.20	0.40
1:A:577:VAL:HG12	1:A:578:PRO:HD2	2.04	0.40
1:B:423:SER:HB3	1:B:432:ARG:HG3	2.03	0.40
1:B:445:SER:O	1:B:448:GLU:HB3	2.21	0.40
1:A:573:ALA:HB3	1:A:585:VAL:HB	2.04	0.40
1:A:607:ARG:C	1:A:608:LYS:HD2	2.41	0.40
1:A:608:LYS:HA	1:A:609:PRO:HD3	1.99	0.40
1:B:182:GLU:OE2	1:B:182:GLU:HA	2.21	0.40
1:B:219:LEU:O	1:B:223:ILE:HG12	2.21	0.40
1:B:483:ILE:HD13	1:B:507:LEU:HD21	2.04	0.40
1:A:390:ALA:HB3	5:A:849:HOH:O	2.20	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	669/692 (97%)	627 (94%)	39 (6%)	3 (0%)	34	60
1	B	669/692 (97%)	619 (92%)	47 (7%)	3 (0%)	34	60
All	All	1338/1384 (97%)	1246 (93%)	86 (6%)	6 (0%)	34	60

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	13	ALA
1	A	565	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	201	ASP
1	A	201	ASP
1	B	227	ASP
1	A	227	ASP

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	579/595 (97%)	558 (96%)	21 (4%)	35	64
1	B	579/595 (97%)	559 (96%)	20 (4%)	36	65
All	All	1158/1190 (97%)	1117 (96%)	41 (4%)	36	65

All (41) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	LEU
1	A	65	GLU
1	A	138	LEU
1	A	142	SER
1	A	210	ASN
1	A	235	ASN
1	A	303	ASP
1	A	380	GLN
1	A	400	LEU
1	A	448	GLU
1	A	449	ARG
1	A	506	ASN
1	A	507	LEU
1	A	545	GLU
1	A	597	THR
1	A	601	LEU
1	A	608	LYS
1	A	614	MET
1	A	630	MET

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	689	ASP
1	A	692	GLU
1	B	8	ILE
1	B	36	ASN
1	B	37	PHE
1	B	138	LEU
1	B	139	ASN
1	B	164	VAL
1	B	169	ARG
1	B	183	ASP
1	B	229	ASN
1	B	235	ASN
1	B	357	GLN
1	B	380	GLN
1	B	507	LEU
1	B	509	ARG
1	B	526	ASN
1	B	560	GLU
1	B	586	GLU
1	B	614	MET
1	B	629	LEU
1	B	655	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	20	HIS
1	A	115	GLN
1	A	210	ASN
1	A	229	ASN
1	A	235	ASN
1	A	271	GLN
1	A	280	ASN
1	A	361	GLN
1	A	365	GLN
1	A	408	GLN
1	A	506	ASN
1	A	550	HIS
1	A	558	GLN
1	A	602	ASN
1	A	611	ASN
1	B	6	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	20	HIS
1	B	36	ASN
1	B	38	GLN
1	B	77	ASN
1	B	119	GLN
1	B	139	ASN
1	B	226	ASN
1	B	229	ASN
1	B	235	ASN
1	B	357	GLN
1	B	361	GLN
1	B	365	GLN
1	B	408	GLN
1	B	450	GLN
1	B	526	ASN
1	B	602	ASN
1	B	611	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 23 ligands modelled in this entry, 23 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 [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

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.