



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 10:02 PM EDT

PDB ID : 1HYR
Title : CRYSTAL STRUCTURE OF HUMAN MICA IN COMPLEX WITH NATURAL KILLER CELL RECEPTOR NKG2D
Authors : Li, P.; Strong, R.K.
Deposited on : 2001-01-21
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) : 2.36.2

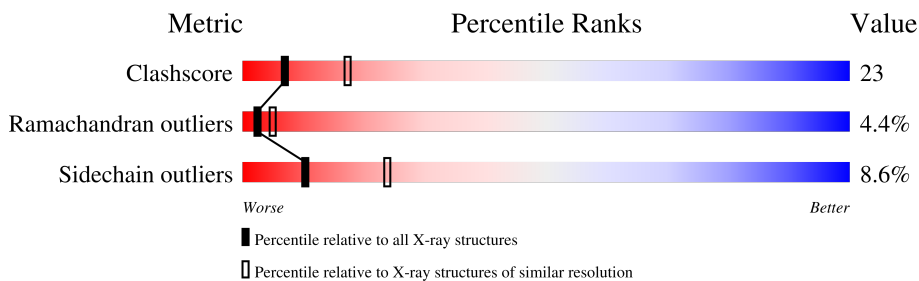
1 Overall quality at a glance

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	137	54% 31% 6% 9%
1	B	137	52% 31% 10% 7%
2	C	275	63% 31% 5% •

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 4309 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 NKG2-D TYPE II INTEGRAL MEMBRANE PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	128	Total 1034	C 659	N 165	O 198	S 12	0	0	0
1	A	124	Total 1004	C 638	N 161	O 193	S 12	0	0	0

- Molecule 2 is a protein called MHC CLASS I CHAIN-RELATED PROTEIN A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	275	Total 2225	C 1374	N 410	O 426	S 15	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	0	MET	-	INITIATING METHIONINE	UNP Q9TQ92

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	7	Total 7	O 7	0	0
3	A	3	Total 3	O 3	0	0
3	C	36	Total 36	O 36	0	0

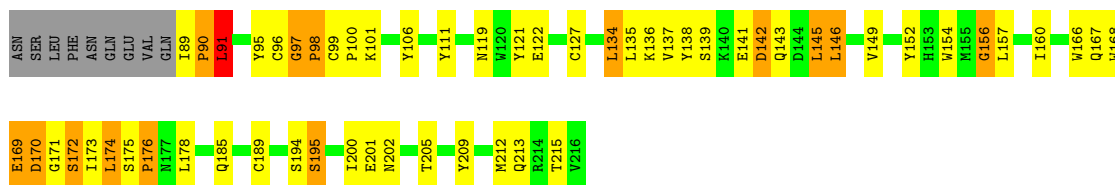
3 Residue-property plots [i](#)

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. 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. 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.

Note EDS was not executed.

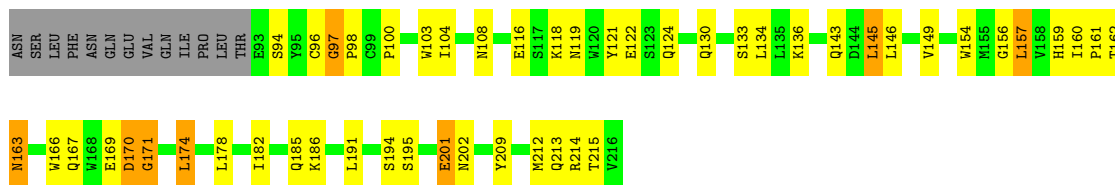
• Molecule 1: NKG2-D TYPE II INTEGRAL MEMBRANE PROTEIN

Chain B: 



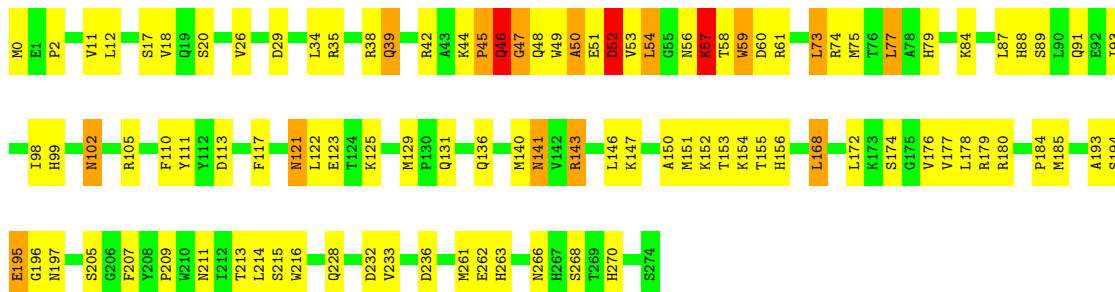
• Molecule 1: NKG2-D TYPE II INTEGRAL MEMBRANE PROTEIN

Chain A: 



• Molecule 2: MHC CLASS I CHAIN-RELATED PROTEIN A

Chain C: 



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 4 21 2	Depositor
Cell constants a, b, c, α , β , γ	122.78Å 122.78Å 101.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.78 – 2.70	Depositor
% Data completeness (in resolution range)	96.1 (29.78-2.70)	Depositor
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.227 , 0.282	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	4309	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

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	0.34	0/1032	0.62	0/1398
1	B	0.35	0/1063	0.68	0/1442
2	C	0.39	0/2278	0.69	0/3084
All	All	0.37	0/4373	0.67	0/5924

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 [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	1004	0	942	42	0
1	B	1034	0	978	68	0
2	C	2225	0	2119	88	0
3	A	3	0	0	1	0
3	B	7	0	0	0	0
3	C	36	0	0	4	0
All	All	4309	0	4039	191	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 23.

All (191) 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:C:216:TRP:H	2:C:228:GLN:HE22	1.09	0.97
2:C:153:THR:HG22	2:C:156:HIS:ND1	1.90	0.86
1:B:89:ILE:HG22	1:B:90:PRO:HD2	1.59	0.85
2:C:147:LYS:HE3	3:C:293:HOH:O	1.77	0.83
2:C:121:ASN:HD22	2:C:123:GLU:H	1.29	0.81
2:C:216:TRP:H	2:C:228:GLN:NE2	1.78	0.79
1:B:98:PRO:HD2	1:B:215:THR:CG2	2.12	0.79
1:B:201:GLU:HG2	1:B:202:ASN:H	1.48	0.79
2:C:213:THR:HB	2:C:262:GLU:HG3	1.63	0.78
2:C:121:ASN:HD21	2:C:123:GLU:HB2	1.49	0.78
2:C:174:SER:OG	2:C:176:VAL:HG23	1.82	0.77
1:B:119:ASN:HD22	1:B:122:GLU:H	1.33	0.76
2:C:47:GLY:HA3	2:C:49:TRP:CE3	2.21	0.75
1:B:138:TYR:H	1:B:143:GLN:NE2	1.84	0.74
1:B:139:SER:OG	1:B:142:ASP:HB2	1.87	0.74
1:B:137:VAL:HA	1:B:143:GLN:HE22	1.53	0.74
1:B:98:PRO:HD2	1:B:215:THR:HG21	1.69	0.74
1:A:154:TRP:HB2	1:A:209:TYR:HB3	1.68	0.73
1:B:149:VAL:O	1:B:194:SER:HB2	1.90	0.72
2:C:121:ASN:ND2	2:C:123:GLU:H	1.87	0.72
1:A:191:LEU:CD1	1:A:201:GLU:HG3	2.20	0.71
1:B:201:GLU:HG2	1:B:202:ASN:N	2.06	0.70
1:A:119:ASN:ND2	1:A:122:GLU:H	1.89	0.70
1:A:191:LEU:HD11	1:A:201:GLU:HG3	1.73	0.70
2:C:18:VAL:HG22	2:C:77:LEU:HD13	1.73	0.70
2:C:49:TRP:CZ3	2:C:54:LEU:HD22	2.26	0.70
1:A:170:ASP:CG	1:A:171:GLY:H	1.93	0.68
1:A:124:GLN:HG3	1:A:169:GLU:OE1	1.94	0.68
2:C:122:LEU:O	2:C:125:LYS:HE3	1.94	0.67
1:B:111:TYR:HE2	1:B:212:MET:HE2	1.58	0.67
1:B:202:ASN:HB3	1:B:205:THR:OG1	1.94	0.66
2:C:46:GLN:O	2:C:47:GLY:O	2.12	0.66
2:C:168:LEU:O	2:C:172:LEU:HG	1.96	0.65
1:A:185:GLN:HE21	1:A:202:ASN:H	1.43	0.65
1:B:175:SER:HB2	1:B:178:LEU:CD1	2.28	0.63
1:B:89:ILE:CG2	1:B:90:PRO:HD2	2.29	0.63
1:B:136:LYS:O	1:B:212:MET:HE1	1.99	0.62
2:C:0:MET:HE2	2:C:179:ARG:HH11	1.64	0.62
2:C:193:ALA:HA	2:C:197:ASN:O	2.00	0.61
1:B:170:ASP:O	1:B:172:SER:N	2.34	0.61
1:B:91:LEU:HD12	1:B:91:LEU:O	2.01	0.61
1:B:157:LEU:HD11	1:B:166:TRP:HB3	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:136:LYS:HA	1:B:168:TRP:CZ3	2.36	0.60
1:A:96:CYS:O	1:A:97:GLY:O	2.19	0.60
2:C:121:ASN:HD22	2:C:121:ASN:C	2.05	0.60
2:C:194:SER:O	2:C:195:GLU:HB2	2.02	0.59
2:C:18:VAL:HG12	2:C:74:ARG:HD2	1.85	0.59
1:B:119:ASN:HB3	1:B:122:GLU:CG	2.33	0.58
1:B:136:LYS:H	1:B:212:MET:HE1	1.68	0.58
2:C:261:MET:HG2	2:C:262:GLU:N	2.16	0.58
1:A:186:LYS:HG3	2:C:17:SER:HB2	1.86	0.58
1:B:160:ILE:HD11	1:B:167:GLN:HG2	1.87	0.57
1:B:168:TRP:O	1:B:170:ASP:N	2.32	0.57
2:C:11:VAL:HG22	2:C:73:LEU:HD13	1.87	0.56
2:C:213:THR:HB	2:C:262:GLU:CG	2.34	0.56
2:C:49:TRP:O	2:C:50:ALA:HB3	2.06	0.56
1:A:170:ASP:OD2	1:A:171:GLY:N	2.37	0.56
1:B:119:ASN:HD21	1:B:121:TYR:HD1	1.53	0.56
2:C:172:LEU:HD23	2:C:177:VAL:HG21	1.88	0.56
2:C:49:TRP:O	2:C:50:ALA:CB	2.54	0.55
2:C:49:TRP:CE3	2:C:54:LEU:HD22	2.41	0.55
1:A:100:PRO:HD3	1:A:213:GLN:OE1	2.07	0.55
1:B:157:LEU:HG	1:B:166:TRP:CE3	2.42	0.55
1:B:175:SER:HB2	1:B:178:LEU:HD12	1.89	0.54
1:B:138:TYR:H	1:B:143:GLN:HE22	1.55	0.54
2:C:216:TRP:N	2:C:228:GLN:HE22	1.93	0.54
1:B:119:ASN:HD22	1:B:122:GLU:N	2.02	0.54
1:B:119:ASN:HB3	1:B:122:GLU:HG3	1.90	0.54
2:C:56:ASN:O	2:C:59:TRP:N	2.38	0.54
1:B:119:ASN:HB3	1:B:122:GLU:HB2	1.90	0.54
2:C:141:ASN:C	2:C:141:ASN:HD22	2.10	0.53
2:C:153:THR:HG23	2:C:155:THR:N	2.23	0.53
1:A:170:ASP:CG	1:A:171:GLY:N	2.62	0.53
1:B:201:GLU:CG	1:B:202:ASN:H	2.17	0.52
1:A:108:ASN:HB3	1:A:215:THR:HG21	1.90	0.52
2:C:45:PRO:O	2:C:46:GLN:HB3	2.09	0.52
2:C:56:ASN:O	2:C:58:THR:N	2.42	0.52
1:B:127:CYS:SG	1:B:134:LEU:HD13	2.49	0.52
2:C:51:GLU:O	2:C:52:ASP:CB	2.58	0.52
1:B:152:TYR:CD1	1:B:152:TYR:N	2.78	0.52
2:C:153:THR:HG23	2:C:155:THR:H	1.74	0.52
1:B:119:ASN:ND2	1:B:121:TYR:HB2	2.25	0.51
1:B:136:LYS:H	1:B:212:MET:CE	2.23	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:0:MET:CE	2:C:179:ARG:HH11	2.24	0.51
2:C:2:PRO:HB3	2:C:99:HIS:HA	1.92	0.51
2:C:146:LEU:HA	2:C:150:ALA:HB3	1.92	0.51
1:B:202:ASN:HB3	1:B:205:THR:HG1	1.74	0.51
2:C:20:SER:O	2:C:38:ARG:HD2	2.10	0.51
1:B:100:PRO:HD3	1:B:213:GLN:NE2	2.25	0.51
1:B:136:LYS:HG3	1:B:168:TRP:CD2	2.45	0.51
1:B:201:GLU:CG	1:B:202:ASN:N	2.73	0.51
2:C:268:SER:OG	2:C:270:HIS:HE1	1.93	0.51
1:B:185:GLN:HB2	1:B:201:GLU:HA	1.92	0.51
2:C:51:GLU:O	2:C:52:ASP:HB3	2.10	0.51
1:A:163:ASN:C	1:A:163:ASN:HD22	2.15	0.50
2:C:18:VAL:CG1	2:C:74:ARG:HD2	2.41	0.50
1:B:106:TYR:CD1	1:A:104:ILE:HG12	2.46	0.50
1:B:170:ASP:C	1:B:172:SER:H	2.14	0.50
1:B:127:CYS:SG	1:B:134:LEU:CD1	2.99	0.50
1:B:185:GLN:O	1:B:200:ILE:HG22	2.12	0.50
2:C:184:PRO:HB3	2:C:207:PHE:HB3	1.94	0.50
1:A:191:LEU:HD12	1:A:201:GLU:HG3	1.94	0.50
1:A:136:LYS:HB3	1:A:212:MET:CE	2.42	0.50
2:C:84:LYS:O	2:C:88:HIS:HE1	1.95	0.49
1:A:149:VAL:O	1:A:194:SER:HB2	2.13	0.49
2:C:75:MET:O	2:C:79:HIS:HD2	1.94	0.49
2:C:143:ARG:NH1	3:C:293:HOH:O	2.40	0.49
2:C:194:SER:O	2:C:195:GLU:CB	2.59	0.49
1:B:96:CYS:O	1:B:97:GLY:O	2.31	0.49
2:C:59:TRP:HA	2:C:59:TRP:CE3	2.48	0.49
1:A:103:TRP:HZ2	1:A:130:GLN:NE2	2.12	0.48
1:A:159:HIS:HB2	1:A:166:TRP:CZ3	2.48	0.48
2:C:11:VAL:CG2	2:C:73:LEU:HD13	2.44	0.48
2:C:121:ASN:ND2	2:C:123:GLU:HB2	2.24	0.48
1:B:134:LEU:HB3	1:B:156:GLY:N	2.29	0.47
1:B:137:VAL:HA	1:B:143:GLN:NE2	2.25	0.47
1:B:119:ASN:HD21	1:B:121:TYR:HB2	1.77	0.47
1:B:154:TRP:HB2	1:B:209:TYR:HB3	1.96	0.47
1:B:160:ILE:HD11	1:B:167:GLN:CG	2.44	0.47
2:C:59:TRP:HA	2:C:59:TRP:HE3	1.79	0.47
2:C:42:ARG:HD2	3:C:276:HOH:O	2.14	0.47
1:A:133:SER:HB2	1:A:169:GLU:OE2	2.14	0.47
1:B:95:TYR:CZ	1:A:98:PRO:HG3	2.49	0.47
2:C:184:PRO:HD3	2:C:263:HIS:CD2	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:196:GLY:C	2:C:197:ASN:HD22	2.18	0.47
1:A:160:ILE:HD11	1:A:167:GLN:OE1	2.14	0.46
1:A:178:LEU:HB2	3:A:26:HOH:O	2.14	0.46
2:C:216:TRP:HB2	2:C:228:GLN:NE2	2.31	0.46
1:A:119:ASN:HD21	1:A:122:GLU:H	1.61	0.46
2:C:136:GLN:O	2:C:140:MET:HG2	2.16	0.46
1:A:154:TRP:HB2	1:A:209:TYR:CB	2.42	0.46
2:C:57:LYS:HD2	2:C:57:LYS:HA	1.77	0.46
2:C:93:ILE:HD12	2:C:111:TYR:CE1	2.51	0.46
1:B:119:ASN:HB3	1:B:122:GLU:CB	2.47	0.45
1:B:98:PRO:HA	1:A:94:SER:O	2.17	0.45
1:B:106:TYR:CD2	1:B:145:LEU:HG	2.51	0.45
1:A:212:MET:HG2	1:A:213:GLN:N	2.32	0.45
1:A:116:GLU:OE1	1:A:118:LYS:HE2	2.17	0.45
1:A:157:LEU:HD11	1:A:174:LEU:HD12	1.99	0.45
2:C:102:ASN:HD22	2:C:102:ASN:HA	1.56	0.45
1:B:145:LEU:HB3	1:A:104:ILE:HD11	1.98	0.44
2:C:26:VAL:HB	2:C:34:LEU:HB2	2.00	0.44
2:C:209:PRO:O	2:C:263:HIS:HE1	2.01	0.44
1:B:136:LYS:N	1:B:212:MET:HE1	2.31	0.44
1:A:159:HIS:HB2	1:A:166:TRP:CE3	2.52	0.44
1:B:136:LYS:HA	1:B:168:TRP:CE3	2.53	0.44
1:A:118:LYS:HD3	1:A:122:GLU:HG2	1.99	0.44
1:A:134:LEU:HB2	1:A:156:GLY:CA	2.48	0.44
1:B:160:ILE:HD11	1:B:167:GLN:CD	2.38	0.44
2:C:98:ILE:CD1	2:C:168:LEU:HD13	2.48	0.44
1:B:173:ILE:HG22	1:B:174:LEU:N	2.32	0.43
1:B:143:GLN:O	1:B:146:LEU:HB2	2.18	0.43
1:B:143:GLN:HB3	1:B:146:LEU:HD22	2.00	0.43
1:B:154:TRP:CZ3	1:B:189:CYS:HB3	2.53	0.42
2:C:29:ASP:OD1	2:C:177:VAL:HG11	2.19	0.42
1:A:182:ILE:HD13	2:C:79:HIS:CE1	2.53	0.42
2:C:205:SER:HB2	3:C:278:HOH:O	2.18	0.42
2:C:232:ASP:OD2	2:C:233:VAL:N	2.45	0.42
1:B:157:LEU:CD1	1:B:166:TRP:HB3	2.47	0.42
2:C:58:THR:C	2:C:60:ASP:H	2.21	0.42
2:C:88:HIS:HD2	2:C:113:ASP:OD2	2.01	0.42
2:C:35:ARG:CG	2:C:44:LYS:HD2	2.49	0.42
2:C:0:MET:HE2	2:C:179:ARG:NH1	2.33	0.42
2:C:121:ASN:HD22	2:C:123:GLU:N	2.08	0.42
1:B:137:VAL:HG22	1:B:168:TRP:CZ2	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:119:ASN:ND2	1:A:121:TYR:HB2	2.35	0.42
2:C:46:GLN:O	2:C:46:GLN:CG	2.66	0.42
1:B:169:GLU:O	1:B:170:ASP:HB3	2.20	0.41
2:C:110:PHE:HB3	2:C:117:PHE:CZ	2.54	0.41
2:C:214:LEU:HD12	2:C:261:MET:HB2	2.01	0.41
1:A:143:GLN:O	1:A:146:LEU:HB2	2.19	0.41
2:C:54:LEU:HG	2:C:56:ASN:OD1	2.20	0.41
1:A:103:TRP:HZ2	1:A:130:GLN:HE21	1.68	0.41
2:C:168:LEU:HD22	2:C:172:LEU:HD11	2.02	0.41
2:C:262:GLU:HA	2:C:266:ASN:O	2.21	0.41
1:A:136:LYS:HB3	1:A:212:MET:HE1	2.03	0.41
2:C:153:THR:OG1	2:C:154:LYS:N	2.54	0.41
2:C:12:LEU:CD2	2:C:89:SER:HB3	2.51	0.41
2:C:45:PRO:O	2:C:46:GLN:CB	2.68	0.41
1:A:161:PRO:O	1:A:162:THR:C	2.60	0.41
1:B:99:CYS:O	1:A:94:SER:HA	2.21	0.41
1:B:135:LEU:HD23	1:B:135:LEU:C	2.41	0.41
2:C:153:THR:HG23	2:C:156:HIS:H	1.86	0.41
2:C:214:LEU:CD1	2:C:261:MET:HB2	2.51	0.41
2:C:98:ILE:HD12	2:C:168:LEU:HD13	2.03	0.40
2:C:39:GLN:HE21	2:C:39:GLN:HB2	1.51	0.40
2:C:47:GLY:HA3	2:C:49:TRP:CZ3	2.55	0.40
1:A:145:LEU:HD13	1:A:146:LEU:N	2.35	0.40
2:C:53:VAL:O	2:C:54:LEU:O	2.39	0.40
1:B:175:SER:HA	1:B:176:PRO:HD3	1.80	0.40
2:C:91:GLN:HB2	2:C:111:TYR:HB2	2.03	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	122/137 (89%)	100 (82%)	19 (16%)	3 (2%)	5	14
1	B	126/137 (92%)	103 (82%)	11 (9%)	12 (10%)	0	0
2	C	273/275 (99%)	247 (90%)	18 (7%)	8 (3%)	4	10
All	All	521/549 (95%)	450 (86%)	48 (9%)	23 (4%)	2	5

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	90	PRO
1	B	91	LEU
1	B	97	GLY
1	B	101	LYS
1	B	170	ASP
1	A	97	GLY
2	C	47	GLY
2	C	50	ALA
2	C	54	LEU
2	C	195	GLU
1	B	169	GLU
1	B	171	GLY
2	C	45	PRO
2	C	52	ASP
2	C	57	LYS
1	B	156	GLY
1	A	170	ASP
1	B	172	SER
1	B	195	SER
2	C	46	GLN
1	A	171	GLY
1	B	98	PRO
1	B	176	PRO

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	114/127 (90%)	107 (94%)	7 (6%)	18	41
1	B	118/127 (93%)	110 (93%)	8 (7%)	16	36
2	C	246/246 (100%)	220 (89%)	26 (11%)	6	15
All	All	478/500 (96%)	437 (91%)	41 (9%)	10	24

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

Mol	Chain	Res	Type
1	B	91	LEU
1	B	134	LEU
1	B	141	GLU
1	B	142	ASP
1	B	145	LEU
1	B	146	LEU
1	B	174	LEU
1	B	195	SER
1	A	145	LEU
1	A	157	LEU
1	A	163	ASN
1	A	174	LEU
1	A	195	SER
1	A	201	GLU
1	A	214	ARG
2	C	39	GLN
2	C	46	GLN
2	C	48	GLN
2	C	52	ASP
2	C	57	LYS
2	C	59	TRP
2	C	61	ARG
2	C	73	LEU
2	C	77	LEU
2	C	87	LEU
2	C	102	ASN
2	C	105	ARG
2	C	121	ASN
2	C	129	MET
2	C	131	GLN
2	C	141	ASN
2	C	143	ARG
2	C	151	MET
2	C	152	LYS

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Mol	Chain	Res	Type
2	C	168	LEU
2	C	178	LEU
2	C	180	ARG
2	C	185	MET
2	C	211	ASN
2	C	215	SER
2	C	236	ASP

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

Mol	Chain	Res	Type
1	B	112	GLN
1	B	119	ASN
1	B	143	GLN
1	B	153	HIS
1	B	167	GLN
1	B	207	ASN
1	B	213	GLN
1	A	102	ASN
1	A	119	ASN
1	A	124	GLN
1	A	130	GLN
1	A	163	ASN
1	A	185	GLN
1	A	207	ASN
2	C	39	GLN
2	C	88	HIS
2	C	102	ASN
2	C	109	HIS
2	C	121	ASN
2	C	131	GLN
2	C	141	ASN
2	C	158	HIS
2	C	197	ASN
2	C	228	GLN
2	C	263	HIS
2	C	267	HIS
2	C	270	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides 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

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.