



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 11:08 PM UTC

PDB ID : 8QMD / pdb_00008qmd
Title : Human NK cell receptor NKp80, extracellular domain
Authors : Blaha, J.; Pazderova, K.; Kalouskova, B.; Wilmanns, M.; Vanek, O.
Deposited on : 2023-09-22
Resolution : 2.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
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

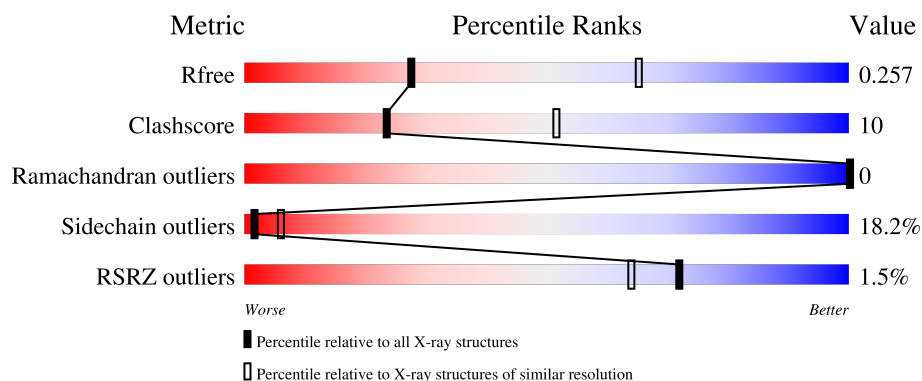
1 Overall quality at a glance

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 ≥ 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	182	2% 39% 19% 8% • 32%
1	B	182	44% 15% 7% • 32%
1	C	182	2% 40% 16% 10% • 32%
1	D	182	• 46% 14% 7% 33%
1	E	182	• 42% 19% 5% • 32%

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Mol	Chain	Length	Quality of chain
1	F	182	% 46% 15% 6% • 32%
1	G	182	% 40% 19% 8% • 34%
1	H	182	% 45% 16% 5% • 32%
1	I	182	2% 42% 18% 7% • 32%
1	J	182	43% 16% 7% • 32%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10402 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 Killer cell lectin-like receptor subfamily F member 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	123	Total	C	N	O	S	0	0	0
			1021	667	163	182	9			
1	D	122	Total	C	N	O	S	0	0	0
			1014	663	162	180	9			
1	A	123	Total	C	N	O	S	0	0	0
			1021	667	163	182	9			
1	B	124	Total	C	N	O	S	0	0	0
			1030	672	165	184	9			
1	E	124	Total	C	N	O	S	0	0	0
			1030	672	165	184	9			
1	F	124	Total	C	N	O	S	0	0	0
			1030	672	165	184	9			
1	G	121	Total	C	N	O	S	0	0	0
			1007	658	161	179	9			
1	H	123	Total	C	N	O	S	0	0	0
			1021	667	163	182	9			
1	I	123	Total	C	N	O	S	0	0	0
			1021	667	163	182	9			
1	J	123	Total	C	N	O	S	0	0	0
			1024	669	165	181	9			

There are 150 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	1	ILE	-	expression tag	UNP Q9NZS2
C	2	THR	-	expression tag	UNP Q9NZS2
C	3	GLY	-	expression tag	UNP Q9NZS2
C	43	SER	CYS	engineered mutation	UNP Q9NZS2
C	172	GLY	-	expression tag	UNP Q9NZS2
C	173	THR	-	expression tag	UNP Q9NZS2
C	174	HIS	-	expression tag	UNP Q9NZS2
C	175	HIS	-	expression tag	UNP Q9NZS2
C	176	HIS	-	expression tag	UNP Q9NZS2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	177	HIS	-	expression tag	UNP Q9NZS2
C	178	HIS	-	expression tag	UNP Q9NZS2
C	179	HIS	-	expression tag	UNP Q9NZS2
C	180	HIS	-	expression tag	UNP Q9NZS2
C	181	HIS	-	expression tag	UNP Q9NZS2
C	182	GLY	-	expression tag	UNP Q9NZS2
D	1	ILE	-	expression tag	UNP Q9NZS2
D	2	THR	-	expression tag	UNP Q9NZS2
D	3	GLY	-	expression tag	UNP Q9NZS2
D	43	SER	CYS	engineered mutation	UNP Q9NZS2
D	172	GLY	-	expression tag	UNP Q9NZS2
D	173	THR	-	expression tag	UNP Q9NZS2
D	174	HIS	-	expression tag	UNP Q9NZS2
D	175	HIS	-	expression tag	UNP Q9NZS2
D	176	HIS	-	expression tag	UNP Q9NZS2
D	177	HIS	-	expression tag	UNP Q9NZS2
D	178	HIS	-	expression tag	UNP Q9NZS2
D	179	HIS	-	expression tag	UNP Q9NZS2
D	180	HIS	-	expression tag	UNP Q9NZS2
D	181	HIS	-	expression tag	UNP Q9NZS2
D	182	GLY	-	expression tag	UNP Q9NZS2
A	1	ILE	-	expression tag	UNP Q9NZS2
A	2	THR	-	expression tag	UNP Q9NZS2
A	3	GLY	-	expression tag	UNP Q9NZS2
A	43	SER	CYS	engineered mutation	UNP Q9NZS2
A	172	GLY	-	expression tag	UNP Q9NZS2
A	173	THR	-	expression tag	UNP Q9NZS2
A	174	HIS	-	expression tag	UNP Q9NZS2
A	175	HIS	-	expression tag	UNP Q9NZS2
A	176	HIS	-	expression tag	UNP Q9NZS2
A	177	HIS	-	expression tag	UNP Q9NZS2
A	178	HIS	-	expression tag	UNP Q9NZS2
A	179	HIS	-	expression tag	UNP Q9NZS2
A	180	HIS	-	expression tag	UNP Q9NZS2
A	181	HIS	-	expression tag	UNP Q9NZS2
A	182	GLY	-	expression tag	UNP Q9NZS2
B	1	ILE	-	expression tag	UNP Q9NZS2
B	2	THR	-	expression tag	UNP Q9NZS2
B	3	GLY	-	expression tag	UNP Q9NZS2
B	43	SER	CYS	engineered mutation	UNP Q9NZS2
B	172	GLY	-	expression tag	UNP Q9NZS2
B	173	THR	-	expression tag	UNP Q9NZS2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	174	HIS	-	expression tag	UNP Q9NZS2
B	175	HIS	-	expression tag	UNP Q9NZS2
B	176	HIS	-	expression tag	UNP Q9NZS2
B	177	HIS	-	expression tag	UNP Q9NZS2
B	178	HIS	-	expression tag	UNP Q9NZS2
B	179	HIS	-	expression tag	UNP Q9NZS2
B	180	HIS	-	expression tag	UNP Q9NZS2
B	181	HIS	-	expression tag	UNP Q9NZS2
B	182	GLY	-	expression tag	UNP Q9NZS2
E	1	ILE	-	expression tag	UNP Q9NZS2
E	2	THR	-	expression tag	UNP Q9NZS2
E	3	GLY	-	expression tag	UNP Q9NZS2
E	43	SER	CYS	engineered mutation	UNP Q9NZS2
E	172	GLY	-	expression tag	UNP Q9NZS2
E	173	THR	-	expression tag	UNP Q9NZS2
E	174	HIS	-	expression tag	UNP Q9NZS2
E	175	HIS	-	expression tag	UNP Q9NZS2
E	176	HIS	-	expression tag	UNP Q9NZS2
E	177	HIS	-	expression tag	UNP Q9NZS2
E	178	HIS	-	expression tag	UNP Q9NZS2
E	179	HIS	-	expression tag	UNP Q9NZS2
E	180	HIS	-	expression tag	UNP Q9NZS2
E	181	HIS	-	expression tag	UNP Q9NZS2
E	182	GLY	-	expression tag	UNP Q9NZS2
F	1	ILE	-	expression tag	UNP Q9NZS2
F	2	THR	-	expression tag	UNP Q9NZS2
F	3	GLY	-	expression tag	UNP Q9NZS2
F	43	SER	CYS	engineered mutation	UNP Q9NZS2
F	172	GLY	-	expression tag	UNP Q9NZS2
F	173	THR	-	expression tag	UNP Q9NZS2
F	174	HIS	-	expression tag	UNP Q9NZS2
F	175	HIS	-	expression tag	UNP Q9NZS2
F	176	HIS	-	expression tag	UNP Q9NZS2
F	177	HIS	-	expression tag	UNP Q9NZS2
F	178	HIS	-	expression tag	UNP Q9NZS2
F	179	HIS	-	expression tag	UNP Q9NZS2
F	180	HIS	-	expression tag	UNP Q9NZS2
F	181	HIS	-	expression tag	UNP Q9NZS2
F	182	GLY	-	expression tag	UNP Q9NZS2
G	1	ILE	-	expression tag	UNP Q9NZS2
G	2	THR	-	expression tag	UNP Q9NZS2
G	3	GLY	-	expression tag	UNP Q9NZS2

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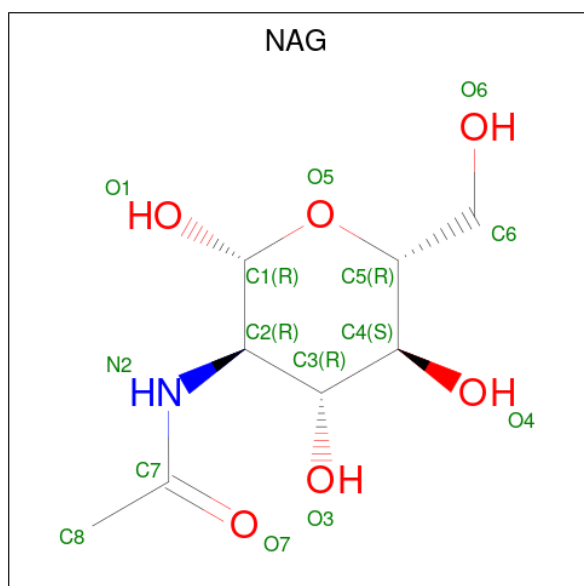
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G	43	SER	CYS	engineered mutation	UNP Q9NZS2
G	172	GLY	-	expression tag	UNP Q9NZS2
G	173	THR	-	expression tag	UNP Q9NZS2
G	174	HIS	-	expression tag	UNP Q9NZS2
G	175	HIS	-	expression tag	UNP Q9NZS2
G	176	HIS	-	expression tag	UNP Q9NZS2
G	177	HIS	-	expression tag	UNP Q9NZS2
G	178	HIS	-	expression tag	UNP Q9NZS2
G	179	HIS	-	expression tag	UNP Q9NZS2
G	180	HIS	-	expression tag	UNP Q9NZS2
G	181	HIS	-	expression tag	UNP Q9NZS2
G	182	GLY	-	expression tag	UNP Q9NZS2
H	1	ILE	-	expression tag	UNP Q9NZS2
H	2	THR	-	expression tag	UNP Q9NZS2
H	3	GLY	-	expression tag	UNP Q9NZS2
H	43	SER	CYS	engineered mutation	UNP Q9NZS2
H	172	GLY	-	expression tag	UNP Q9NZS2
H	173	THR	-	expression tag	UNP Q9NZS2
H	174	HIS	-	expression tag	UNP Q9NZS2
H	175	HIS	-	expression tag	UNP Q9NZS2
H	176	HIS	-	expression tag	UNP Q9NZS2
H	177	HIS	-	expression tag	UNP Q9NZS2
H	178	HIS	-	expression tag	UNP Q9NZS2
H	179	HIS	-	expression tag	UNP Q9NZS2
H	180	HIS	-	expression tag	UNP Q9NZS2
H	181	HIS	-	expression tag	UNP Q9NZS2
H	182	GLY	-	expression tag	UNP Q9NZS2
I	1	ILE	-	expression tag	UNP Q9NZS2
I	2	THR	-	expression tag	UNP Q9NZS2
I	3	GLY	-	expression tag	UNP Q9NZS2
I	43	SER	CYS	engineered mutation	UNP Q9NZS2
I	172	GLY	-	expression tag	UNP Q9NZS2
I	173	THR	-	expression tag	UNP Q9NZS2
I	174	HIS	-	expression tag	UNP Q9NZS2
I	175	HIS	-	expression tag	UNP Q9NZS2
I	176	HIS	-	expression tag	UNP Q9NZS2
I	177	HIS	-	expression tag	UNP Q9NZS2
I	178	HIS	-	expression tag	UNP Q9NZS2
I	179	HIS	-	expression tag	UNP Q9NZS2
I	180	HIS	-	expression tag	UNP Q9NZS2
I	181	HIS	-	expression tag	UNP Q9NZS2
I	182	GLY	-	expression tag	UNP Q9NZS2

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Chain	Residue	Modelled	Actual	Comment	Reference
J	1	ILE	-	expression tag	UNP Q9NZS2
J	2	THR	-	expression tag	UNP Q9NZS2
J	3	GLY	-	expression tag	UNP Q9NZS2
J	43	SER	CYS	engineered mutation	UNP Q9NZS2
J	172	GLY	-	expression tag	UNP Q9NZS2
J	173	THR	-	expression tag	UNP Q9NZS2
J	174	HIS	-	expression tag	UNP Q9NZS2
J	175	HIS	-	expression tag	UNP Q9NZS2
J	176	HIS	-	expression tag	UNP Q9NZS2
J	177	HIS	-	expression tag	UNP Q9NZS2
J	178	HIS	-	expression tag	UNP Q9NZS2
J	179	HIS	-	expression tag	UNP Q9NZS2
J	180	HIS	-	expression tag	UNP Q9NZS2
J	181	HIS	-	expression tag	UNP Q9NZS2
J	182	GLY	-	expression tag	UNP Q9NZS2

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	C	1	Total	C	N	O	0	0
			14	8	1	5		
2	D	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	E	1	Total	C	N	O	0	0
			14	8	1	5		
2	F	1	Total	C	N	O	0	0
			14	8	1	5		
2	G	1	Total	C	N	O	0	0
			14	8	1	5		
2	H	1	Total	C	N	O	0	0
			14	8	1	5		
2	I	1	Total	C	N	O	0	0
			14	8	1	5		
2	J	1	Total	C	N	O	0	0
			14	8	1	5		

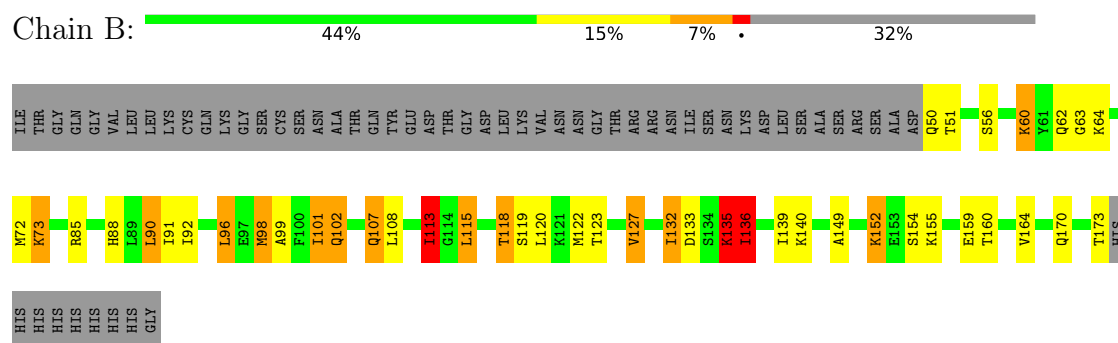
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	6	Total	O	0	0
			6	6		
3	D	8	Total	O	0	0
			8	8		
3	A	3	Total	O	0	0
			3	3		
3	B	3	Total	O	0	0
			3	3		
3	E	2	Total	O	0	0
			2	2		
3	F	3	Total	O	0	0
			3	3		
3	G	5	Total	O	0	0
			5	5		
3	H	3	Total	O	0	0
			3	3		
3	I	5	Total	O	0	0
			5	5		
3	J	5	Total	O	0	0
			5	5		

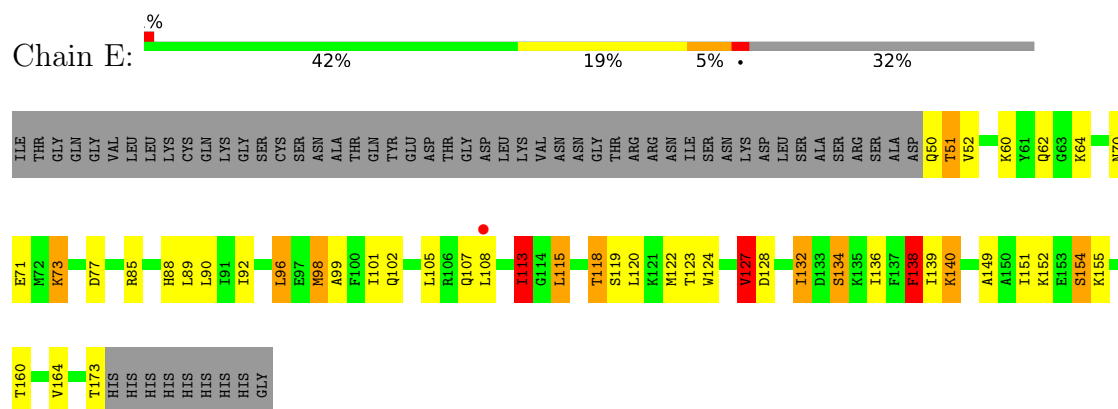
- Molecule 1: Killer cell lectin-like receptor subfamily F member 1



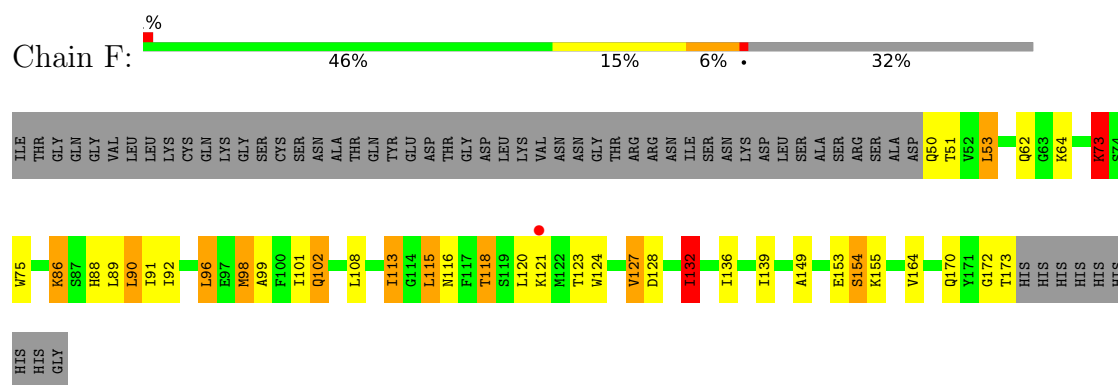
- Molecule 1: Killer cell lectin-like receptor subfamily F member 1



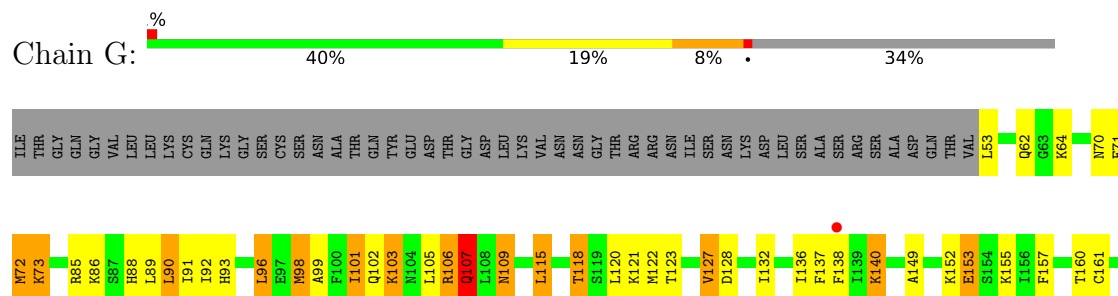
- Molecule 1: Killer cell lectin-like receptor subfamily F member 1

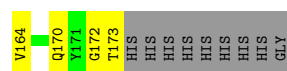


- Molecule 1: Killer cell lectin-like receptor subfamily F member 1

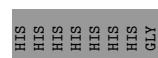
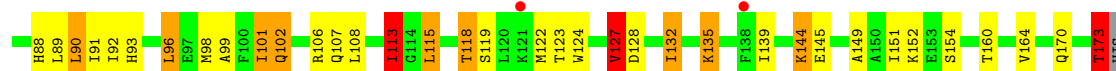
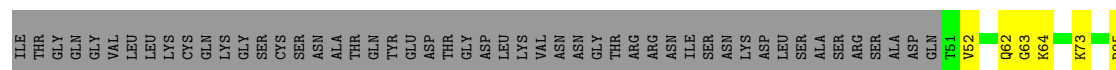


- Molecule 1: Killer cell lectin-like receptor subfamily F member 1

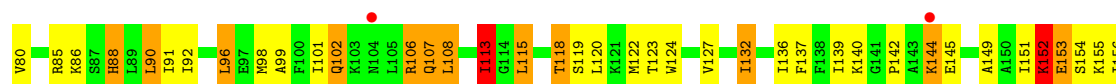
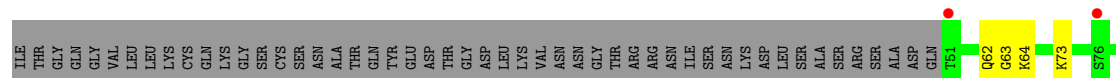




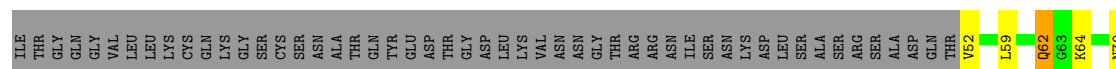
- Molecule 1: Killer cell lectin-like receptor subfamily F member 1



- Molecule 1: Killer cell lectin-like receptor subfamily F member 1



- Molecule 1: Killer cell lectin-like receptor subfamily F member 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	183.54Å 183.54Å 123.67Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	97.61 – 2.90 97.61 – 2.90	Depositor EDS
% Data completeness (in resolution range)	93.9 (97.61-2.90) 93.9 (97.61-2.90)	Depositor EDS
R_{merge}	0.64	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.09 (at 2.91Å)	Xtriage
Refinement program	REFMAC 5.8.0419	Depositor
R, R_{free}	0.221 , 0.257 0.221 , 0.257	Depositor DCC
R_{free} test set	2340 reflections (4.74%)	wwPDB-VP
Wilson B-factor (Å ²)	63.4	Xtriage
Anisotropy	0.139	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 102.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.037 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	10402	wwPDB-VP
Average B, all atoms (Å ²)	96.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.02% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG

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	0.73	0/1051	1.56	16/1420 (1.1%)
1	B	0.71	0/1060	1.46	10/1432 (0.7%)
1	C	0.83	0/1051	1.62	23/1420 (1.6%)
1	D	0.78	1/1044 (0.1%)	1.52	10/1410 (0.7%)
1	E	0.79	0/1060	1.57	14/1432 (1.0%)
1	F	0.84	0/1060	1.67	17/1432 (1.2%)
1	G	0.77	0/1037	1.57	17/1400 (1.2%)
1	H	0.70	0/1051	1.48	8/1420 (0.6%)
1	I	0.71	0/1051	1.56	10/1420 (0.7%)
1	J	0.75	0/1055	1.59	16/1425 (1.1%)
All	All	0.76	1/10520 (0.0%)	1.56	141/14211 (1.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	D	0	1
1	G	0	1
1	I	0	1
All	All	0	4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	172	GLY	C-O	5.21	1.33	1.23

The worst 5 of 141 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	116	ASN	N-CA-CB	-15.13	86.40	111.66
1	F	116	ASN	CB-CA-C	-12.12	84.40	110.45
1	J	173	THR	CB-CA-C	11.25	128.38	111.17
1	E	173	THR	CA-CB-OG1	11.18	126.37	109.60
1	C	128	ASP	CB-CA-C	-10.46	92.90	110.68

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	51	THR	Peptide
1	D	106	ARG	Sidechain
1	G	172	GLY	Peptide
1	I	137	PHE	Peptide

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	1021	0	994	27	0
1	B	1030	0	1002	23	0
1	C	1021	0	994	29	0
1	D	1014	0	987	22	0
1	E	1030	0	1002	22	0
1	F	1030	0	1002	18	0
1	G	1007	0	978	21	0
1	H	1021	0	994	20	0
1	I	1021	0	994	24	0
1	J	1024	0	994	20	0
2	A	14	0	13	0	0
2	B	14	0	13	0	0
2	C	14	0	13	1	0
2	D	14	0	13	1	0
2	E	14	0	13	1	0
2	F	14	0	13	2	0
2	G	14	0	13	0	0
2	H	14	0	13	1	0
2	I	14	0	13	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	J	14	0	13	1	0
3	A	3	0	0	1	0
3	B	3	0	0	0	0
3	C	6	0	0	0	0
3	D	8	0	0	7	0
3	E	2	0	0	1	0
3	F	3	0	0	0	0
3	G	5	0	0	2	0
3	H	3	0	0	0	0
3	I	5	0	0	0	0
3	J	5	0	0	1	0
All	All	10402	0	10071	209	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 10.

The worst 5 of 209 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:D:128:ASP:HA	3:D:305:HOH:O	1.55	1.04
1:I:102:GLN:OE1	1:I:154:SER:HB3	1.64	0.96
1:G:161:CYS:HB2	3:G:303:HOH:O	1.68	0.94
1:F:102:GLN:OE1	1:F:154:SER:HB3	1.69	0.91
1:J:102:GLN:OE1	1:J:154:SER:HB3	1.70	0.89

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	121/182 (66%)	116 (96%)	5 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	122/182 (67%)	117 (96%)	5 (4%)	0	100	100
1	C	121/182 (66%)	118 (98%)	3 (2%)	0	100	100
1	D	120/182 (66%)	116 (97%)	4 (3%)	0	100	100
1	E	122/182 (67%)	117 (96%)	5 (4%)	0	100	100
1	F	122/182 (67%)	118 (97%)	4 (3%)	0	100	100
1	G	119/182 (65%)	117 (98%)	2 (2%)	0	100	100
1	H	121/182 (66%)	116 (96%)	5 (4%)	0	100	100
1	I	121/182 (66%)	115 (95%)	6 (5%)	0	100	100
1	J	121/182 (66%)	116 (96%)	5 (4%)	0	100	100
All	All	1210/1820 (66%)	1166 (96%)	44 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	114/164 (70%)	88 (77%)	26 (23%)	1	3
1	B	115/164 (70%)	91 (79%)	24 (21%)	1	4
1	C	114/164 (70%)	93 (82%)	21 (18%)	1	6
1	D	113/164 (69%)	97 (86%)	16 (14%)	3	11
1	E	115/164 (70%)	93 (81%)	22 (19%)	1	5
1	F	115/164 (70%)	96 (84%)	19 (16%)	2	8
1	G	112/164 (68%)	92 (82%)	20 (18%)	2	6
1	H	114/164 (70%)	96 (84%)	18 (16%)	2	8
1	I	114/164 (70%)	94 (82%)	20 (18%)	2	6
1	J	114/164 (70%)	93 (82%)	21 (18%)	1	6
All	All	1140/1640 (70%)	933 (82%)	207 (18%)	2	6

5 of 207 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	98	MET
1	G	127	VAL
1	J	118	THR
1	F	115	LEU
1	G	73	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	88	HIS
1	J	95	GLN
1	H	95	GLN
1	I	170	GLN
1	J	107	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

10 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	F	201	1	14,14,15	0.76	0	17,19,21	2.87	7 (41%)
2	NAG	E	201	1	14,14,15	0.68	0	17,19,21	2.48	7 (41%)
2	NAG	C	201	1	14,14,15	0.64	0	17,19,21	3.34	7 (41%)
2	NAG	J	201	1	14,14,15	0.56	0	17,19,21	2.71	6 (35%)
2	NAG	A	201	1	14,14,15	0.51	0	17,19,21	2.77	6 (35%)
2	NAG	I	201	1	14,14,15	0.73	1 (7%)	17,19,21	2.67	2 (11%)
2	NAG	G	201	1	14,14,15	0.56	0	17,19,21	2.07	3 (17%)
2	NAG	H	201	1	14,14,15	0.63	0	17,19,21	1.64	4 (23%)
2	NAG	B	201	1	14,14,15	0.58	0	17,19,21	2.79	3 (17%)
2	NAG	D	201	1	14,14,15	0.47	0	17,19,21	2.95	5 (29%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	F	201	1	-	3/6/23/26	0/1/1/1
2	NAG	E	201	1	-	4/6/23/26	0/1/1/1
2	NAG	C	201	1	-	5/6/23/26	0/1/1/1
2	NAG	J	201	1	-	4/6/23/26	0/1/1/1
2	NAG	A	201	1	-	5/6/23/26	0/1/1/1
2	NAG	I	201	1	-	2/6/23/26	0/1/1/1
2	NAG	G	201	1	-	4/6/23/26	0/1/1/1
2	NAG	H	201	1	-	4/6/23/26	0/1/1/1
2	NAG	B	201	1	-	2/6/23/26	0/1/1/1
2	NAG	D	201	1	-	0/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	I	201	NAG	C1-C2	2.34	1.55	1.52

The worst 5 of 50 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	201	NAG	C1-C2-N2	10.21	126.53	110.43
2	B	201	NAG	C1-C2-N2	9.70	125.72	110.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	201	NAG	C2-N2-C7	8.77	134.65	122.90
2	D	201	NAG	O5-C1-C2	7.81	123.37	111.29
2	C	201	NAG	O4-C4-C3	-7.14	93.55	110.38

There are no chirality outliers.

5 of 33 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	201	NAG	C8-C7-N2-C2
2	C	201	NAG	O7-C7-N2-C2
2	A	201	NAG	C8-C7-N2-C2
2	A	201	NAG	O7-C7-N2-C2
2	B	201	NAG	C8-C7-N2-C2

There are no ring outliers.

6 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	201	NAG	2	0
2	E	201	NAG	1	0
2	C	201	NAG	1	0
2	J	201	NAG	1	0
2	H	201	NAG	1	0
2	D	201	NAG	1	0

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	123/182 (67%)	0.07	4 (3%) 49 40	55, 100, 166, 191	0
1	B	124/182 (68%)	-0.06	0 100 100	62, 111, 166, 184	0
1	C	123/182 (67%)	-0.20	4 (3%) 49 40	45, 78, 147, 172	0
1	D	122/182 (67%)	-0.38	1 (0%) 82 77	47, 78, 131, 152	0
1	E	124/182 (68%)	-0.27	1 (0%) 82 77	40, 80, 152, 188	0
1	F	124/182 (68%)	-0.26	1 (0%) 82 77	46, 79, 142, 171	0
1	G	121/182 (66%)	-0.30	1 (0%) 82 77	49, 82, 139, 193	0
1	H	123/182 (67%)	-0.01	2 (1%) 70 62	63, 106, 165, 188	0
1	I	123/182 (67%)	0.08	4 (3%) 49 40	61, 106, 168, 202	0
1	J	123/182 (67%)	-0.15	0 100 100	49, 88, 147, 170	0
All	All	1230/1820 (67%)	-0.15	18 (1%) 72 64	40, 90, 160, 202	0

The worst 5 of 18 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	121	LYS	4.1
1	C	51	THR	3.9
1	C	108	LEU	3.5
1	C	138	PHE	3.5
1	E	108	LEU	3.4

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](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	NAG	H	201	14/15	0.92	0.08	79,90,99,102	0
2	NAG	E	201	14/15	0.93	0.09	76,87,102,114	0
2	NAG	J	201	14/15	0.93	0.07	80,93,112,120	0
2	NAG	D	201	14/15	0.94	0.09	73,92,128,133	0
2	NAG	C	201	14/15	0.95	0.07	71,85,106,110	0
2	NAG	G	201	14/15	0.95	0.07	74,83,114,126	0
2	NAG	F	201	14/15	0.96	0.07	54,71,97,101	0
2	NAG	B	201	14/15	0.96	0.06	69,77,109,113	0
2	NAG	I	201	14/15	0.97	0.06	81,95,106,108	0
2	NAG	A	201	14/15	0.97	0.06	73,81,96,103	0

6.5 Other polymers [i](#)

There are no such residues in this entry.