

Full wwPDB X-ray Structure Validation Report (i)

May 13, 2020 - 01:15 am BST

PDB ID	:	5NK9
Title	:	Crystal Structure of Ephrin A2 (EphA2) Receptor Protein Kinase with Com-
		pound 2e
Authors	:	Kudlinzki, D.; Linhard, V.L.; Witt, K.; Gande, S.L.; Saxena, K.; Heinzlmeir,
		S.; Medard, G.; Kuester, B.; Schwalbe, H.
Deposited on	:	2017-03-31
$\operatorname{Resolution}$:	1.59 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 (i) symbol.

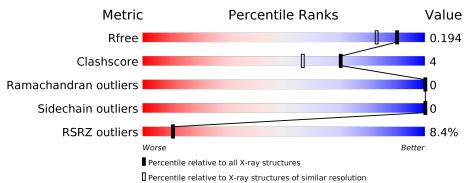
The following versions of software and data (see references (1)) were used in the production of this report:

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: X-RAY DIFFRACTION

The reported resolution of this entry is 1.59 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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f Similar\ resolution}\ (\#{ m Entries},{ m resolution\ range}({ m \AA}))$
R_{free}	130704	$5534 \ (1.60-1.56)$
Clashscore	141614	5861(1.60-1.56)
Ramachandran outliers	138981	5708 (1.60-1.56)
Sidechain outliers	138945	5703 (1.60-1.56)
RSRZ outliers	127900	5431 (1.60-1.56)

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 on 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 <=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							
			8%							
1	A	306	86%	7%	7%					

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	912	А	1001[A]	Х	-	-	-
2	912	А	1001[B]	Х	-	-	-



2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 2653 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.

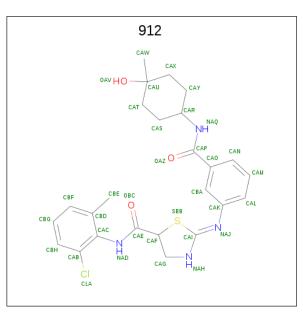
• Molecule 1 is a protein called Ephrin type-A receptor 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Λ	285	Total	С	Ν	Ο	\mathbf{S}	0	6	0
	A 285	200	2324	1483	399	424	18	0	Ö	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
А	595	GLY	-	expression tag	UNP P29317

• Molecule 2 is (2 {Z})- {N}-(2-chloranyl-6-methyl-phenyl)-2-[3-[(4-methyl-4-oxidanyl-cy clohexyl)carbamoyl]phenyl]imino-1,3-thiazolidine-5-carboxamide (three-letter code: 912) (formula: $C_{25}H_{29}ClN_4O_3S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
2	А	1	Total 68		$\begin{array}{c} \mathrm{Cl} \\ 2 \end{array}$			$\frac{S}{2}$	0	1

• Molecule 3 is water.

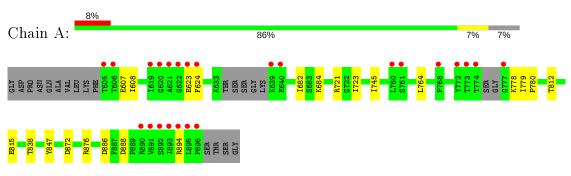


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	А	261	Total O 261 261	0	0



3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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: Ephrin type-A receptor 2



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants	32.79Å 107.63Å 40.50 Å	Depositor
a, b, c, α , β , γ	90.00° 108.75° 90.00°	Depositor
Resolution (Å)	38.35 - 1.59	Depositor
Resolution (A)	38.35 - 1.59	EDS
% Data completeness	98.6(38.35-1.59)	Depositor
(in resolution range)	98.6(38.35 - 1.59)	EDS
R _{merge}	(Not available)	Depositor
R _{sym}	(Not available)	Depositor
$< I/\sigma(I) > 1$	1.82 (at 1.59 Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
D D	0.162 , 0.195	Depositor
R, R_{free}	0.162 , 0.194	DCC
R_{free} test set	1766 reflections $(5.00%)$	wwPDB-VP
Wilson B-factor (Å ²)	14.7	Xtriage
Anisotropy	0.182	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$, $B_{sol}(Å^2)$	0.36 , 51.8	EDS
L-test for twinning ²	$ L > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	2653	wwPDB-VP
Average B, all atoms $(Å^2)$	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 8.88% of the height of the origin peak. No significant pseudotranslation is detected.

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.



¹Intensities estimated from amplitudes.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: 912

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		
	Chain	RMSZ	# Z > 5	RMSZ	# Z > 5	
1	А	0.40	0/2372	0.56	0/3201	

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	А	2324	0	2336	15	0
2	А	68	0	0	2	0
3	А	261	0	0	3	0
All	All	2653	0	2336	17	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 4.

All (17) 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:838[B]:THR:HG21	1:A:886:ASP:O	1.83	0.79

Continued on next page...



Atom-1	Atom-2	Interatomic	Clash
		distance (Å)	overlap (Å)
1:A:894:ARG:NH2	3:A:1101:HOH:O	2.15	0.78
1:A:721[A]:ARG:HD2	1:A:872[A]:ASP:OD1	2.00	0.60
1:A:838[A]:THR:HG22	1:A:847:TYR:CE2	2.36	0.59
1:A:888:ASP:OD2	3:A:1102:HOH:O	2.17	0.58
1:A:764:LEU:HD22	1:A:780:PRO:HD3	1.86	0.56
2:A:1001[A]:912:CBA	2:A:1001[A]:912:SBB	3.04	0.46
2:A:1001[B]:912:SBB	2:A:1001[B]:912:CBA	3.04	0.46
1:A:778:LYS:O	1:A:779:ILE:HD12	2.16	0.46
1:A:608:ILE:O	1:A:682:ILE:HG12	2.17	0.45
1:A:812:THR:HB	1:A:815[A]:GLU:HG3	2.00	0.44
1:A:723:ILE:HD13	1:A:745[B]:ILE:HD13	2.01	0.42
1:A:838[B]:THR:HG22	3:A:1254:HOH:O	2.19	0.41
1:A:623:GLU:HG2	1:A:624:PHE:CE2	2.55	0.41
1:A:607:GLU:HG2	1:A:684:LYS:HD2	2.03	0.41
1:A:838[A]:THR:HG22	1:A:847:TYR:CD2	2.55	0.40
1:A:872[B]:ASP:OD2	1:A:876:ARG:NH2	2.53	0.40

Continued from previous page...

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	А	285/306~(93%)	280~(98%)	5(2%)	0	100 100

There are no Ramachandran outliers to report.

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	А	252/262~(96%)	252~(100%)	0	100 100	

There are no protein residues with a non-rotameric sidechain to report.

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	А	824	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 carbohydrates in this entry.

5.6 Ligand geometry (i)

2 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	True	Chain	Dec	Bog Link Bond lengths			E	Bond ang	gles	
	Type	Chain	Res	Link	Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z >2
2	912	А	1001[B]	-	$36,\!37,\!37$	<mark>3.27</mark>	17 (47%)	47,53,53	<mark>3.47</mark>	21 (44%)
2	912	А	1001[A]	-	$36,\!37,\!37$	<mark>3.21</mark>	16 (44%)	47,53,53	<mark>3.43</mark>	22 (46%)



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	912	А	1001[B]	-	1/1/6/9	4/20/41/41	0/4/4/4
2	912	А	1001[A]	-	1/1/6/9	4/20/41/41	0/4/4/4

Ζ Observed(Å) Ideal(Å) Mol Chain Res Type Atoms 21001[B]912 CAF-CAE -8.741.381.52А 21.39А 1001[A]912CAF-CAE -8.621.522А 1001[B]CAF-SBB 912 -7.441.681.822 А 1001[A] 912 CAF-SBB 1.691.82-7.10 $\overline{2}$ Α 1001[A]912CAK-NAJ -7.091.301.422А 1001[B]912CAK-NAJ -7.091.301.42 $\overline{2}$ А 1001[A]912 CBE-CBD -5.161.401.51 $\overline{2}$ А 912 CAG-NAH -5.031.451001[A]1.33 $\mathbf{2}$ А 1001[B] 912 CAG-NAH -5.031.331.45 $\overline{2}$ А 1001[B]912 -4.841.401.50CAO-CAP $\overline{2}$ А 1001[A]912 CAO-CAP -4.841.401.50 $\overline{2}$ А 1001[B] 912 CAB-CLA -4.571.621.732А 1001[A]912 CAT-CAU -4.241.481.53 $\overline{2}$ А 1001B 912 CAT-CAU -4.211.481.53 $\overline{2}$ А 1.431001[B] 912 CBE-CBD -3.881.512А 1001[B]912 CAC-NAD -3.681.361.43 $\overline{2}$ А CAT-CAS 1.531001[B]912 -3.621.452А 912 CAT-CAS -3.591.531001[A]1.452А 1001[A]912 CAC-NAD -3.43 1.361.43А 21001[B]912 CAY-CAR -3.321.521.44 $\overline{2}$ А 1001[A]912 CAY-CAR -3.311.521.44 $\overline{2}$ А 1001[A]912 CAI-SBB -3.141.681.76 $\mathbf{2}$ А CAI-SBB 1001[B]912 -3.121.681.76 $\overline{2}$ А 1001[B]912 OAV-CAU -3.011.401.44 2А OAV-CAU -2.981001[A]912 1.401.442 А 1001[B] 912 CAL-CAK -2.651.341.39 $\overline{2}$ А CAL-CAK -2.611.341.391001[A]912 2А 1001[A] 912 **OBC-CAE** -2.611.18 1.23 $\overline{2}$ 912^{-1} А 1001[B]OBC-CAE -2.481.181.232А 1001[A]912CAM-CAN -2.051.341.38 $\overline{2}$ А 1001[B] 912 CAS-CAR -2.021.471.52 $\overline{2}$ А 1001[A]912 CAS-CAR -2.021.471.52

All (33) bond length outliers are listed below:

Continued on next page...



Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1001[B]	912	CAM-CAN	-2.00	1.34	1.38

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
2	А	1001[A]	912	CAR-NAQ-CAP	11.04	137.84	122.55
2	А	1001[B]	912	CAR-NAQ-CAP	11.03	137.82	122.55
2	А	1001[A]	912	CAE-CAF-SBB	10.00	122.52	107.90
2	А	1001[B]	912	CAE-CAF-SBB	9.98	122.49	107.90
2	А	1001[A]	912	CAS-CAT-CAU	-7.76	107.21	112.97
2	А	1001[B]	912	CAS-CAT-CAU	-7.70	107.25	112.97
2	А	1001[A]	912	CAT-CAS-CAR	-7.30	99.52	110.65
2	А	1001[B]	912	CAT-CAS-CAR	-7.27	99.55	110.65
2	А	1001[A]	912	CAX-CAY-CAR	-6.00	101.49	110.65
2	А	1001[B]	912	CAX-CAY-CAR	-5.98	101.53	110.65
2	А	1001[B]	912	CAW-CAU-CAX	-5.53	104.73	111.32
2	А	1001[A]	912	CAW-CAU-CAX	-5.50	104.76	111.32
2	А	1001[B]	912	CAY-CAR-NAQ	5.17	121.27	110.56
2	А	1001[A]	912	CAY-CAR-NAQ	5.14	121.20	110.56
2	А	1001[B]	912	CAM-CAL-CAK	3.75	124.78	119.74
2	А	1001[A]	912	CAM-CAL-CAK	3.73	124.75	119.74
2	А	1001[A]	912	CBA-CAK-NAJ	3.14	127.93	120.45
2	А	1001[B]	912	CBA-CAK-NAJ	3.14	127.92	120.45
2	А	1001[B]	912	OAV-CAU-CAX	3.05	114.63	107.67
2	А	1001[A]	912	OAV-CAU-CAX	3.04	114.60	107.67
2	А	1001[A]	912	CAX-CAU-CAT	3.03	114.46	109.88
2	А	1001[B]	912	CAX-CAU-CAT	3.02	114.44	109.88
2	А	1001[B]	912	CAF-SBB-CAI	2.83	95.16	91.38
2	А	1001[A]	912	CAF-SBB-CAI	2.80	95.12	91.38
2	А	1001[B]	912	CBE-CBD-CAC	2.76	125.00	121.44
2	А	1001[B]	912	OBC-CAE-CAF	-2.69	117.71	121.61
2	А	1001[A]	912	OAV-CAU-CAT	-2.66	101.61	107.67
2	А	1001[B]	912	OAV-CAU-CAT	-2.63	101.66	107.67
2	А	1001[B]	912	CAO-CAP-NAQ	-2.58	112.12	117.06
2	А	1001[A]	912	CAO-CAP-NAQ	-2.58	112.12	117.06
2	А	1001[A]	912	OBC-CAE-CAF	-2.57	117.89	121.61
2	А	1001[B]	912	CAL-CAM-CAN	-2.37	116.88	120.25
2	А	1001[A]	912	CAL-CAM-CAN	-2.36	116.89	120.25
2	А	1001[A]	912	CAM-CAN-CAO	2.24	122.99	120.34
2	А	1001[B]	912	CAM-CAN-CAO	2.23	122.98	120.34
2	А	1001[A]	912	CAC-CAB-CLA	2.12	121.70	119.27
2	А	1001[B]	912	CAS-CAR-NAQ	-2.12	106.18	110.56

Continued on next page...



Mol	Chain	Res	Type	Atoms		$Observed(^{o})$	$Ideal(^{o})$
2	А	1001[A]	912	CAS-CAR-NAQ	-2.11	106.20	110.56
2	А	1001[B]	912	CAL-CAK-CBA	-2.09	116.97	119.45
2	А	1001[A]	912	CAL-CAK-CBA	-2.07	116.99	119.45
2	А	1001[B]	912	OAZ-CAP-CAO	2.05	124.59	120.94
2	А	1001[A]	912	OAZ-CAP-CAO	2.05	124.59	120.94
2	А	1001[A]	912	CAL-CAK-NAJ	-2.01	115.07	120.44

Continued from previous page...

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	А	1001[B]	912	CAF
2	А	1001[A]	912	CAF

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	А	1001[A]	912	NAD-CAE-CAF-SBB
2	А	1001[B]	912	CAY-CAR-NAQ-CAP
2	А	1001[A]	912	CAY-CAR-NAQ-CAP
2	А	1001[B]	912	OBC-CAE-CAF-SBB
2	А	1001[A]	912	OBC-CAE-CAF-SBB
2	А	1001[B]	912	NAD-CAE-CAF-SBB
2	А	1001[B]	912	CBA-CAK-NAJ-CAI
2	А	1001[A]	912	CBA-CAK-NAJ-CAI

There are no ring outliers.

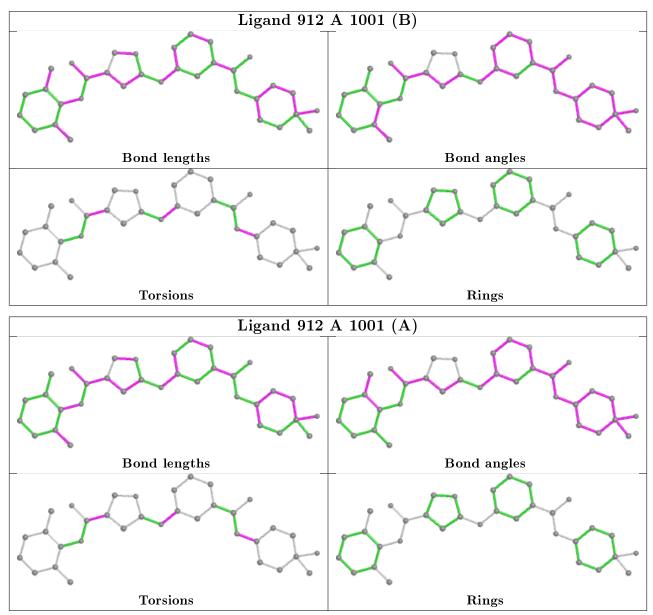
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	А	1001[B]	912	1	0
2	А	1001[A]	912	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.



The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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 $>$	$\# RSRZ {>}2$		$\mathbf{OWAB}(\mathrm{\AA}^2)$	Q<0.9
1	А	285/306~(93%)	0.41	24 (8%) 11	11	9, 20, 48, 68	0

All (24) RSRZ outliers are listed below:

Mol			Type	RSRZ	
1	А	621	ALA	6.6	
1	А	772	TYR	5.8	
1	А	624	PHE	5.7	
1	А	774	THR	5.5	
1	А	619	ILE	5.3	
1	А	639	LYS	4.9	
1	А	773	THR	4.1	
1	А	894	ARG	4.0	
1	А	892	SER	3.8	
1	А	895	LEU	3.7	
1	А	605	THR	3.7	
1	А	891	VAL	3.5	
1	А	768	PRO	3.2	
1	А	640	GLU	3.1	
1	А	777	GLY	3.1	
1	А	623	GLU	3.1	
1	А	761	SER	3.0	
1	А	760	LEU	3.0	
1	А	622	GLY	2.9	
1	А	896	PRO	2.9	
1	А	893	ILE	2.8	
1	А	890	ARG	2.8	
1	А	620	GLY	2.7	
1	А	606	THR	2.3	



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 carbohydrates in this entry.

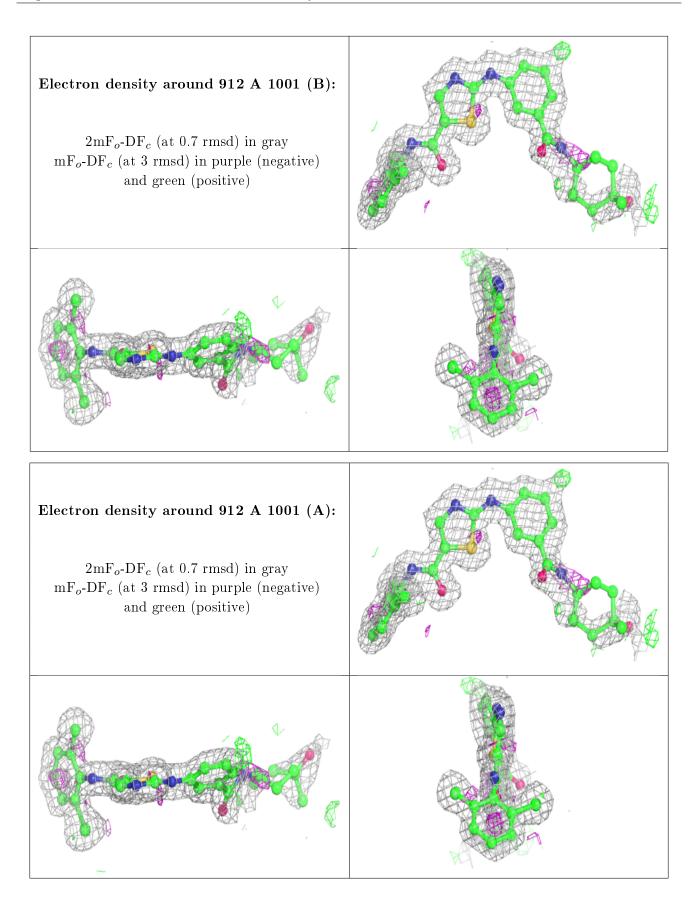
6.4 Ligands (i)

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, 95^{th} 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	$\mathbf{B} ext{-factors}(\mathbf{\AA}^2)$	Q<0.9
2	912	А	1001[B]	34/34	0.95	0.14	$14,\!21,\!56,\!59$	34
2	912	А	1001[A]	34/34	0.95	0.14	$14,\!21,\!56,\!59$	34

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.







6.5 Other polymers (i)

There are no such residues in this entry.

