



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 10:59 AM UTC

PDB ID : 8OO4 / pdb_00008oo4
Title : X-ray structure of the adduct formed upon reaction of cisplatin with human angiogenin after 1 month soaking
Authors : Ferraro, G.; Merlino, A.
Deposited on : 2023-04-04
Resolution : 1.99 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

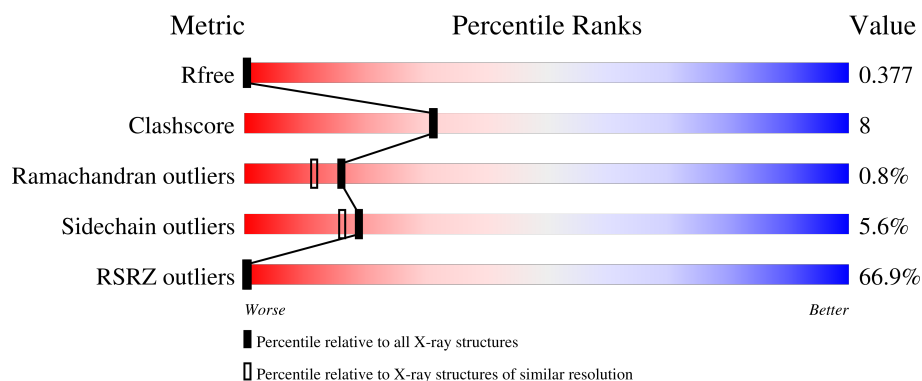
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.99 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	AAA	123	66% 78% 17% ..

2 Entry composition [i](#)

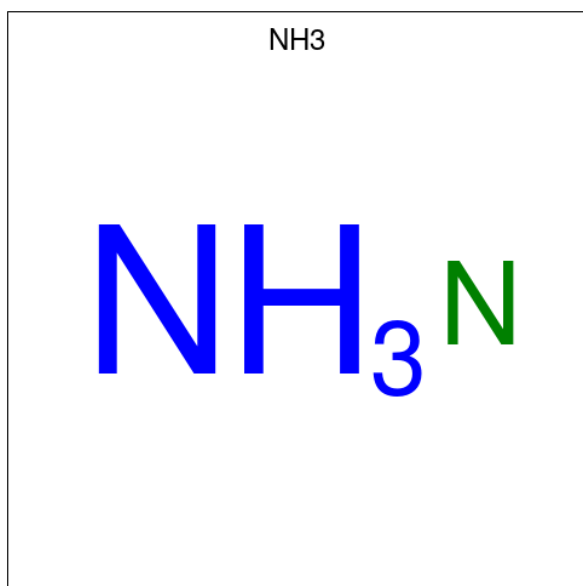
There are 4 unique types of molecules in this entry. The entry contains 1051 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Angiogenin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	AAA	121	Total	C	N	O	S	0	2	0
			993	609	199	178	7			

- Molecule 2 is AMMONIA (CCD ID: NH3) (formula: H₃N) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	AAA	1	Total	N	0	0
			1	1		

- Molecule 3 is PLATINUM (II) ION (CCD ID: PT) (formula: Pt) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	AAA	1	Total	Pt	0	0
			1	1		

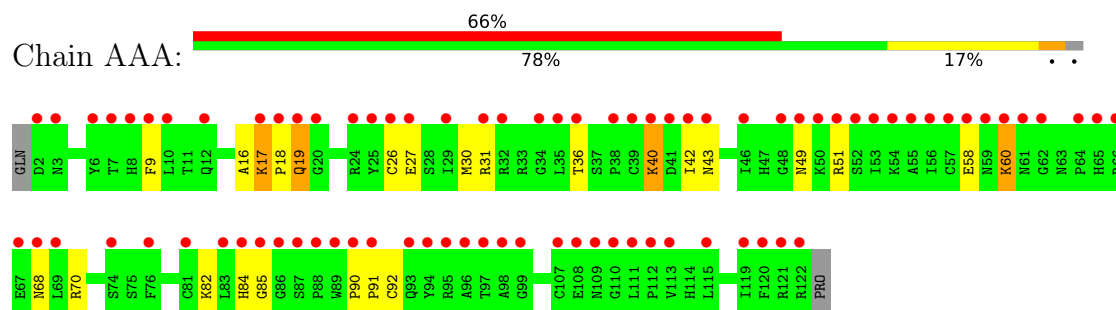
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	AAA	56	Total	O	0	0
			56	56		

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 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: Angiogenin



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	85.25Å 37.51Å 38.16Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.62 – 1.99 42.62 – 1.99	Depositor EDS
% Data completeness (in resolution range)	96.1 (42.62-1.99) 96.1 (42.62-1.99)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.55 (at 1.98Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.308 , 0.367 0.314 , 0.377	Depositor DCC
R_{free} test set	380 reflections (4.28%)	wwPDB-VP
Wilson B-factor (Å ²)	13.4	Xtriage
Anisotropy	0.182	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 28.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.036 for -h,l,k	Xtriage
F_o, F_c correlation	0.83	EDS
Total number of atoms	1051	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.41% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PT, NH3

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	AAA	1.04	0/1016	1.37	0/1368

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	AAA	993	0	963	16	0
2	AAA	1	0	0	0	0
3	AAA	1	0	0	0	0
4	AAA	56	0	0	6	0
All	All	1051	0	963	16	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 8.

All (16) 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:AAA:49:ASN:HB2	4:AAA:310:HOH:O	1.94	0.68
1:AAA:31[B]:ARG:HD3	1:AAA:36:THR:HG21	1.76	0.67
1:AAA:49:ASN:CB	4:AAA:310:HOH:O	2.48	0.62
1:AAA:26:CYS:O	1:AAA:30:MET:HG2	2.09	0.51
1:AAA:31[B]:ARG:NH2	1:AAA:92:CYS:H	2.11	0.48
1:AAA:84:HIS:CD2	1:AAA:85:GLY:H	2.33	0.47
1:AAA:9:PHE:HA	4:AAA:312:HOH:O	2.17	0.45
1:AAA:16:ALA:C	1:AAA:17:LYS:HG3	2.42	0.45
1:AAA:82:LYS:HD2	4:AAA:351:HOH:O	2.16	0.44
1:AAA:27:GLU:O	1:AAA:31[B]:ARG:HG2	2.18	0.44
1:AAA:60:LYS:NZ	4:AAA:304:HOH:O	2.52	0.43
1:AAA:90:PRO:HA	1:AAA:91:PRO:C	2.43	0.42
1:AAA:18:PRO:O	1:AAA:19:GLN:HB2	2.21	0.41
1:AAA:58:GLU:C	1:AAA:70:ARG:HH12	2.28	0.41
1:AAA:40:LYS:NZ	1:AAA:43:ASN:OD1	2.54	0.41
1:AAA:49:ASN:HB3	4:AAA:310:HOH:O	2.18	0.40

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	AAA	121/123 (98%)	110 (91%)	10 (8%)	1 (1%)	16 11

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	AAA	19	GLN

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	AAA	110/110 (100%)	104 (94%)	6 (6%)	19	17

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	AAA	17	LYS
1	AAA	40	LYS
1	AAA	42	ILE
1	AAA	51	ARG
1	AAA	60	LYS
1	AAA	68	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 1 is modelled with single atom and 1 is 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 ⓘ

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	AAA	121/123 (98%)	2.82	81 (66%) 0 0	11, 23, 39, 46	2 (1%)

All (81) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	AAA	85	GLY	7.1
1	AAA	60	LYS	6.9
1	AAA	59	ASN	6.8
1	AAA	122	ARG	6.7
1	AAA	19	GLN	6.1
1	AAA	86	GLY	5.7
1	AAA	107	CYS	5.3
1	AAA	84	HIS	5.1
1	AAA	2	ASP	5.0
1	AAA	51	ARG	4.6
1	AAA	39	CYS	4.6
1	AAA	54	LYS	4.5
1	AAA	89	TRP	4.4
1	AAA	42	ILE	4.2
1	AAA	53	ILE	4.2
1	AAA	109	ASN	4.1
1	AAA	111	LEU	4.1
1	AAA	61	ASN	4.0
1	AAA	57	CYS	4.0
1	AAA	88	PRO	4.0
1	AAA	121	ARG	3.9
1	AAA	18	PRO	3.9
1	AAA	112	PRO	3.9
1	AAA	20	GLY	3.9
1	AAA	66	ARG	3.9
1	AAA	31[A]	ARG	3.9
1	AAA	17	LYS	3.8

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Mol	Chain	Res	Type	RSRZ
1	AAA	8	HIS	3.8
1	AAA	90	PRO	3.8
1	AAA	110	GLY	3.8
1	AAA	83	LEU	3.7
1	AAA	55	ALA	3.7
1	AAA	91	PRO	3.7
1	AAA	36	THR	3.7
1	AAA	67	GLU	3.6
1	AAA	95	ARG	3.5
1	AAA	68	ASN	3.5
1	AAA	56	ILE	3.4
1	AAA	93	GLN	3.2
1	AAA	108	GLU	3.2
1	AAA	49	ASN	3.2
1	AAA	50	LYS	3.2
1	AAA	52	SER	3.1
1	AAA	41	ASP	3.1
1	AAA	25	TYR	3.0
1	AAA	97	THR	3.0
1	AAA	35	LEU	2.9
1	AAA	96	ALA	2.9
1	AAA	38	PRO	2.9
1	AAA	3	ASN	2.8
1	AAA	24	ARG	2.8
1	AAA	40	LYS	2.8
1	AAA	46	ILE	2.8
1	AAA	48	GLY	2.8
1	AAA	7	THR	2.8
1	AAA	87	SER	2.8
1	AAA	62	GLY	2.8
1	AAA	94	TYR	2.7
1	AAA	32	ARG	2.6
1	AAA	69	LEU	2.6
1	AAA	64	PRO	2.5
1	AAA	98	ALA	2.5
1	AAA	58	GLU	2.5
1	AAA	43	ASN	2.5
1	AAA	81	CYS	2.4
1	AAA	113	VAL	2.4
1	AAA	119	ILE	2.4
1	AAA	27	GLU	2.4
1	AAA	34	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
1	AAA	65	HIS	2.3
1	AAA	115	LEU	2.3
1	AAA	10	LEU	2.3
1	AAA	99	GLY	2.2
1	AAA	29	ILE	2.2
1	AAA	120	PHE	2.2
1	AAA	76	PHE	2.1
1	AAA	12	GLN	2.1
1	AAA	74	SER	2.1
1	AAA	9	PHE	2.0
1	AAA	26	CYS	2.0
1	AAA	6	TYR	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

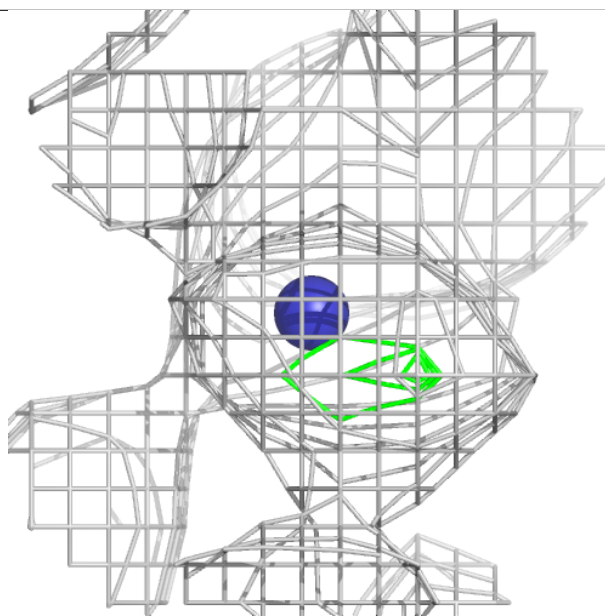
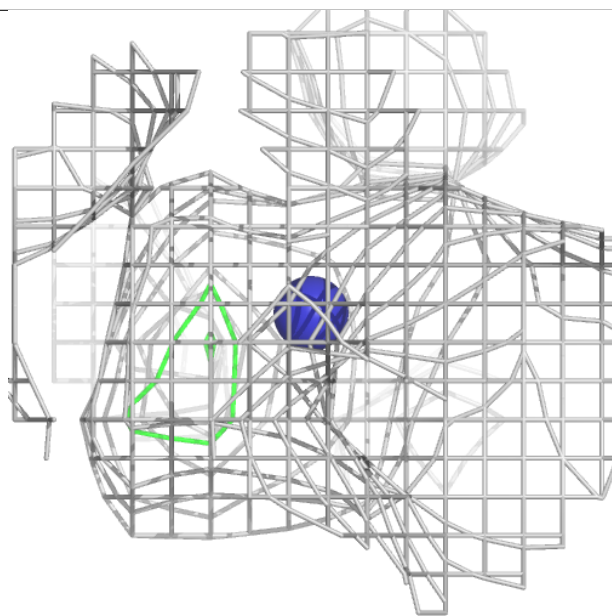
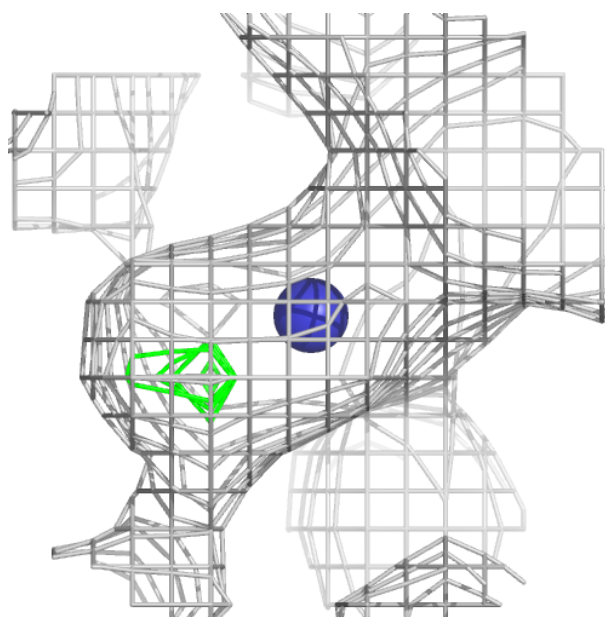
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	NH3	AAA	201	1/1	0.66	0.28	27,27,27,27	0
3	PT	AAA	202	1/1	0.82	0.11	63,63,63,63	1

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.

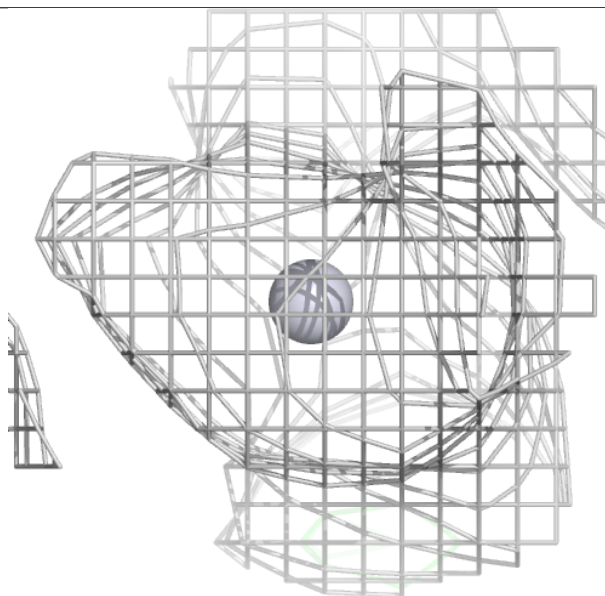
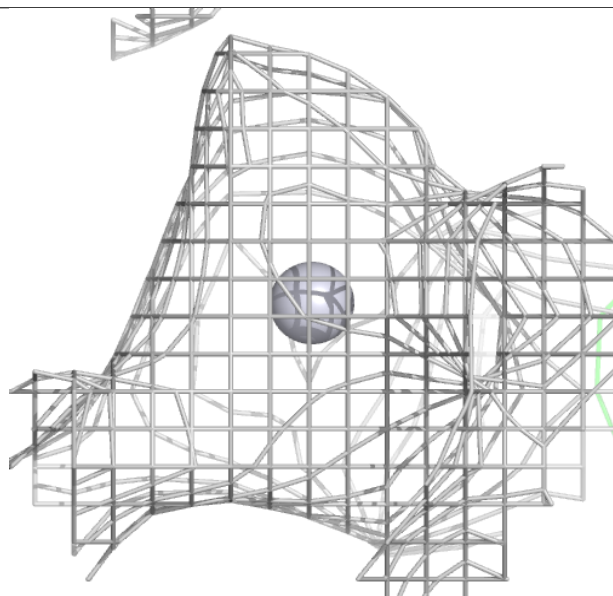
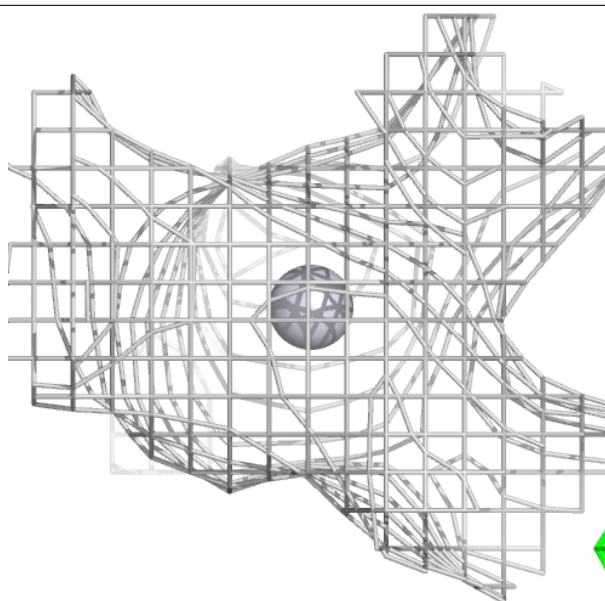
Electron density around NH3 AAA 201:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around PT AAA 202:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.