



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 10:34 AM UTC

PDB ID : 3SGB / pdb_00003sgb
Title : STRUCTURE OF THE COMPLEX OF STREPTOMYCES GRISEUS PROTEASE B AND THE THIRD DOMAIN OF THE TURKEY OVOMUCOID INHIBITOR AT 1.8 ANGSTROMS RESOLUTION
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Deposited on : 1983-01-21
Resolution : 1.80 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)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

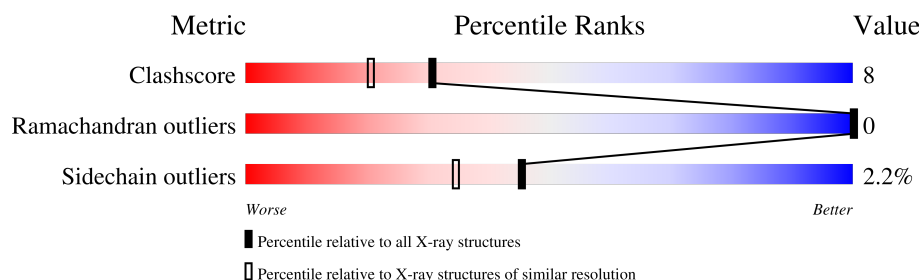
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)

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	E	185	
2	I	56	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 1872 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 PROTEINASE B (SGPB).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	E	185	Total	C	N	O	S	0	0	0
			1310	801	228	275	6			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	235A	VAL	SER	conflict	UNP P00777

- Molecule 2 is a protein called TURKEY OVOMUCOID INHIBITOR (OMTKY3).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	I	50	Total	C	N	O	S	0	0	0
			380	233	64	77	6			

- Molecule 3 is water.

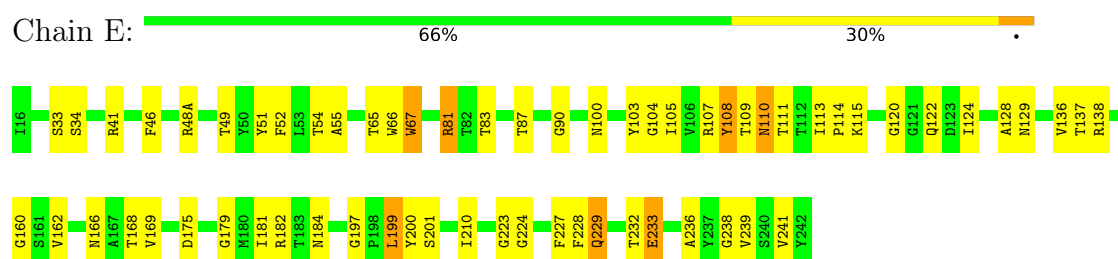
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	E	135	Total	O	0	0
			135	135		
3	I	47	Total	O	0	0
			47	47		

3 Residue-property plots [i](#)

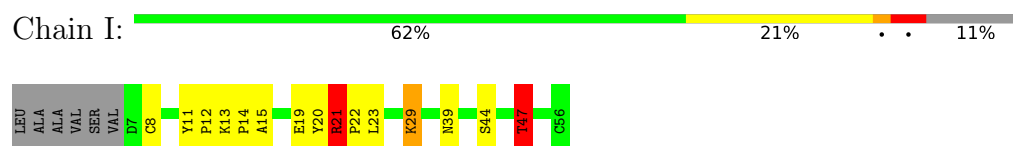
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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: PROTEINASE B (SGPB)



- Molecule 2: TURKEY OVOMUCOID INHIBITOR (OMTKY3)



4 Data and refinement statistics

Xtriage (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	45.35Å 54.52Å 45.65Å 90.00° 119.20° 90.00°	Depositor
Resolution (Å)	6.00 – 1.80	Depositor
% Data completeness (in resolution range)	(Not available) (6.00-1.80)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	unknown	Depositor
R, R_{free}	0.125 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	1872	wwPDB-VP
Average B, all atoms (Å ²)	14.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

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	E	1.53	6/1335 (0.4%)	2.14	55/1820 (3.0%)
2	I	1.31	1/388 (0.3%)	2.11	15/523 (2.9%)
All	All	1.49	7/1723 (0.4%)	2.13	70/2343 (3.0%)

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	E	0	1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	104	GLY	N-CA	7.81	1.52	1.45
1	E	224	GLY	N-CA	6.90	1.53	1.44
2	I	21	ARG	N-CA	6.50	1.52	1.46
1	E	201	SER	N-CA	6.12	1.54	1.46
1	E	210	ILE	CA-CB	5.88	1.61	1.55
1	E	48(A)	ARG	N-CA	5.73	1.52	1.46
1	E	65	THR	CA-CB	5.16	1.61	1.53

All (70) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	47	THR	N-CA-CB	-10.07	94.79	110.30
2	I	21	ARG	O-C-N	10.05	128.27	121.23
1	E	55	ALA	CA-C-N	9.27	130.23	119.94
1	E	55	ALA	C-N-CA	9.27	130.23	119.94
1	E	162	VAL	O-C-N	8.58	132.33	122.81
1	E	233	GLU	CA-CB-CG	7.99	130.08	114.10
2	I	47	THR	OG1-CB-CG2	7.71	124.72	109.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	160	GLY	CA-C-O	-7.54	113.35	120.97
1	E	182	ARG	CD-NE-CZ	7.43	134.80	124.40
1	E	160	GLY	O-C-N	7.34	130.85	123.88
1	E	236	ALA	CA-C-O	-7.33	112.71	120.63
1	E	129	ASN	O-C-N	7.27	131.20	123.06
1	E	105	ILE	O-C-N	7.25	131.50	123.09
1	E	90	GLY	O-C-N	7.19	132.05	122.70
2	I	39	ASN	CA-C-O	-7.12	113.34	120.82
1	E	41	ARG	O-C-N	6.92	132.22	123.23
1	E	184	ASN	OD1-CG-ND2	-6.85	115.75	122.60
2	I	20	TYR	CA-C-O	-6.74	113.53	120.54
1	E	120	GLY	N-CA-C	-6.69	99.86	111.50
1	E	103	TYR	O-C-N	6.63	130.82	123.33
2	I	22	PRO	N-CA-C	6.60	121.88	111.38
1	E	122	GLN	N-CA-C	6.60	119.34	109.25
2	I	23	LEU	CA-C-O	-6.46	113.55	121.11
1	E	51	TYR	O-C-N	6.43	131.06	122.96
1	E	65	THR	O-C-N	6.42	130.49	123.10
1	E	197	GLY	O-C-N	6.30	128.07	121.77
2	I	20	TYR	O-C-N	6.20	130.43	123.05
1	E	239	VAL	O-C-N	6.19	129.19	122.76
1	E	232	THR	CA-CB-OG1	-6.15	100.37	109.60
1	E	49	THR	O-C-N	6.09	130.16	123.22
1	E	129	ASN	CA-C-O	-5.90	114.28	121.36
2	I	15	ALA	O-C-N	5.83	129.66	123.42
1	E	232	THR	CA-C-O	-5.80	114.40	120.55
1	E	238	GLY	O-C-N	-5.80	117.29	122.57
1	E	46	PHE	O-C-N	5.79	129.99	123.27
1	E	199	LEU	N-CA-C	-5.78	98.99	108.41
1	E	232	THR	O-C-N	5.75	128.22	122.12
1	E	109	THR	N-CA-C	-5.75	106.12	114.12
1	E	83	THR	OG1-CB-CG2	5.74	120.78	109.30
2	I	47	THR	CB-CA-C	5.71	122.02	110.38
1	E	124	ILE	CA-C-O	-5.68	114.48	120.39
1	E	87	THR	CA-CB-OG1	-5.62	101.17	109.60
1	E	65	THR	CA-C-O	-5.62	114.65	121.28
2	I	19	GLU	CB-CG-CD	5.60	122.11	112.60
1	E	104	GLY	O-C-N	-5.59	118.51	123.65
1	E	175	ASP	CA-CB-CG	5.55	118.15	112.60
1	E	51	TYR	CA-CB-CG	5.54	123.88	113.90
1	E	229	GLN	OE1-CD-NE2	-5.52	117.08	122.60
1	E	241	VAL	N-CA-C	-5.45	102.03	109.55

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	19	GLU	CG-CD-OE1	5.40	130.82	118.40
1	E	54	THR	O-C-N	-5.40	115.77	122.73
1	E	169	VAL	O-C-N	5.37	129.06	123.26
1	E	210	ILE	N-CA-C	5.35	116.16	111.56
1	E	200	TYR	O-C-N	5.31	130.21	122.94
1	E	52	PHE	CA-CB-CG	5.30	119.11	113.80
1	E	128	ALA	CA-C-O	-5.27	115.44	121.40
1	E	109	THR	N-CA-CB	5.27	118.15	110.88
1	E	54	THR	CA-C-O	5.20	126.50	121.14
1	E	136	VAL	CA-C-O	5.18	126.72	121.64
1	E	223	GLY	CA-C-O	5.18	126.23	121.77
1	E	137	THR	CA-C-O	-5.16	114.40	120.60
1	E	65	THR	CA-CB-OG1	-5.15	101.87	109.60
2	I	29	LYS	O-C-N	5.14	129.20	123.19
1	E	67	TRP	CA-C-O	-5.12	115.44	121.44
2	I	8	CYS	N-CA-C	-5.12	103.97	111.30
1	E	100	ASN	N-CA-CB	5.11	119.12	110.49
2	I	14	PRO	CB-CA-C	5.10	119.12	111.68
1	E	138	ARG	CD-NE-CZ	5.05	131.47	124.40
1	E	168	THR	CA-CB-OG1	-5.05	102.03	109.60
1	E	108	TYR	O-C-N	5.02	129.17	122.95

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	81	ARG	Sidechain

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	E	1310	0	1231	17	0
2	I	380	0	349	10	0
3	E	135	0	0	1	0
3	I	47	0	0	1	0
All	All	1872	0	1580	27	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 (27) 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:I:29:LYS:HE2	3:I:83:HOH:O	1.59	1.01
1:E:110:ASN:C	1:E:110:ASN:HD22	1.84	0.86
2:I:21:ARG:HH21	2:I:21:ARG:HB3	1.37	0.86
1:E:166:ASN:HD22	1:E:179:GLY:HA2	1.45	0.81
2:I:44:SER:HB2	2:I:47:THR:HG22	1.70	0.74
2:I:11:TYR:CZ	2:I:13:LYS:HE3	2.28	0.68
2:I:21:ARG:HH21	2:I:21:ARG:CB	2.07	0.67
2:I:11:TYR:HB3	2:I:12:PRO:HA	1.77	0.64
1:E:166:ASN:ND2	1:E:179:GLY:HA2	2.18	0.58
1:E:110:ASN:ND2	1:E:113:ILE:H	2.06	0.54
1:E:110:ASN:C	1:E:110:ASN:ND2	2.59	0.53
1:E:107:ARG:NH1	3:E:374:HOH:O	2.23	0.52
2:I:21:ARG:HH21	2:I:21:ARG:CG	2.23	0.51
2:I:11:TYR:CE1	2:I:13:LYS:HE3	2.47	0.50
1:E:110:ASN:HD22	1:E:111:THR:N	2.09	0.49
2:I:44:SER:O	2:I:47:THR:HB	2.12	0.49
1:E:33:SER:HB3	1:E:66:TRP:CH2	2.48	0.48
1:E:110:ASN:HD21	1:E:113:ILE:H	1.63	0.46
1:E:108:TYR:CD2	1:E:115:LYS:HE3	2.50	0.46
1:E:67:TRP:CE3	1:E:81:ARG:HG3	2.52	0.45
1:E:199:LEU:HD13	1:E:228:PHE:CZ	2.53	0.43
1:E:166:ASN:HA	1:E:179:GLY:HA2	2.00	0.42
1:E:33:SER:HB3	1:E:66:TRP:CZ3	2.55	0.42
1:E:113:ILE:HA	1:E:114:PRO:HD3	1.88	0.41
2:I:21:ARG:CG	2:I:21:ARG:NH2	2.82	0.41
1:E:181:ILE:O	1:E:227:PHE:HA	2.20	0.41
1:E:229:GLN:HE22	1:E:233:GLU:CD	2.28	0.41

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	E	183/185 (99%)	173 (94%)	10 (6%)	0	100	100
2	I	48/56 (86%)	46 (96%)	2 (4%)	0	100	100
All	All	231/241 (96%)	219 (95%)	12 (5%)	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	E	138/138 (100%)	136 (99%)	2 (1%)	59	52
2	I	44/48 (92%)	42 (96%)	2 (4%)	24	12
All	All	182/186 (98%)	178 (98%)	4 (2%)	45	34

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	34	SER
1	E	110	ASN
2	I	21	ARG
2	I	47	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	110	ASN
1	E	166	ASN
2	I	36	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 oligosaccharides 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.