

Integrative Structure Validation Report

July 22, 2024 - 04:49 PM PDT

The following software was used in the production of this report:

Python-IHM Version 1.3

MolProbity Version 4.5.2

Integrative Modeling Validation Version 1.2

PDB ID	9A24
PDB-Dev ID	PDBDEV_00000141
Structure Title	PTX3 hybrid cryoEM and AlphaFold model
Structure Authors	Dylan P. Noone; Thomas H. Sharp

This is a PDB-Dev IM Structure Validation Report for a publicly released PDB-Dev entry.

We welcome your comments at pdb-dev@mail.wwpdb.org

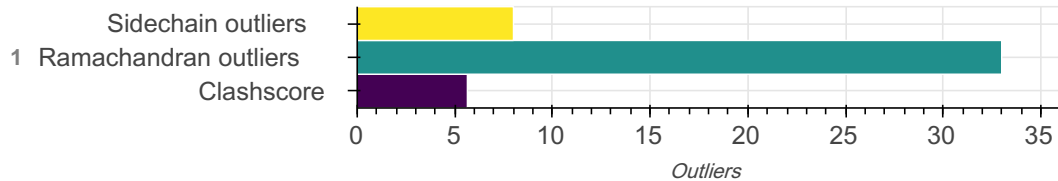
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the  symbol.

List of references used to build this report is available [here](#).

Overall quality

This validation report contains model quality assessments for all structures, data quality assessment for SAS datasets and fit to model assessments for SAS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.

Model Quality: MolProbity Analysis



Ensemble information ?

This entry consists of 0 distinct ensemble(s).

Summary ?

This entry consists of 1 unique models, with 51 subunits in each model. A total of 6 datasets or restraints were used to build this entry. Each model is represented by 0 rigid bodies and 59 flexible or non-rigid units.

Entry composition ?

There is 1 unique type of models in this entry. This model is titled PTX3/None.

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	1	1	PTX3 (protein complex)	A	B	364
1	2	1	PTX3 (protein complex)	B	A	364
1	3	1	PTX3 (protein complex)	C	D	364
1	4	1	PTX3 (protein complex)	D	C	364
1	5	1	PTX3 (protein complex)	E	F	364
1	6	1	PTX3 (protein complex)	F	E	364
1	7	1	PTX3 (protein complex)	G	H	364
1	8	1	PTX3 (protein complex)	H	G	364
1	9	2	N-ACETYL-D-GLUCOSAMINE	I	B	Not available
1	10	2	N-ACETYL-D-GLUCOSAMINE	J	B	Not available

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	11	2	N-ACETYL-D-GLUCOSAMINE	N	A	Not available
1	12	2	N-ACETYL-D-GLUCOSAMINE	O	A	Not available
1	13	2	N-ACETYL-D-GLUCOSAMINE	S	D	Not available
1	14	2	N-ACETYL-D-GLUCOSAMINE	W	D	Not available
1	15	2	N-ACETYL-D-GLUCOSAMINE	X	C	Not available
1	16	2	N-ACETYL-D-GLUCOSAMINE	Y	C	Not available
1	17	2	N-ACETYL-D-GLUCOSAMINE	CA	F	Not available
1	18	2	N-ACETYL-D-GLUCOSAMINE	DA	F	Not available
1	19	2	N-ACETYL-D-GLUCOSAMINE	HA	E	Not available
1	20	2	N-ACETYL-D-GLUCOSAMINE	IA	E	Not available
1	21	2	N-ACETYL-D-GLUCOSAMINE	MA	H	Not available
1	22	2	N-ACETYL-D-GLUCOSAMINE	NA	H	Not available
1	23	2	N-ACETYL-D-GLUCOSAMINE	RA	G	Not available
1	24	2	N-ACETYL-D-GLUCOSAMINE	SA	G	Not available
1	25	3	BETA-D-MANNOSE	K	B	Not available
1	26	3	BETA-D-MANNOSE	P	A	Not available

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	27	3	BETA-D-MANNOSE	T	D	Not available
1	28	3	BETA-D-MANNOSE	Z	C	Not available
1	29	3	BETA-D-MANNOSE	EA	F	Not available
1	30	3	BETA-D-MANNOSE	JA	E	Not available
1	31	3	BETA-D-MANNOSE	OA	H	Not available
1	32	3	BETA-D-MANNOSE	TA	G	Not available
1	33	4	ALPHA-D-MANNOSE	L	B	Not available
1	34	4	ALPHA-D-MANNOSE	M	B	Not available
1	35	4	ALPHA-D-MANNOSE	Q	A	Not available
1	36	4	ALPHA-D-MANNOSE	R	A	Not available
1	37	4	ALPHA-D-MANNOSE	U	D	Not available
1	38	4	ALPHA-D-MANNOSE	V	D	Not available
1	39	4	ALPHA-D-MANNOSE	AA	C	Not available
1	40	4	ALPHA-D-MANNOSE	BA	C	Not available
1	41	4	ALPHA-D-MANNOSE	FA	F	Not available
1	42	4	ALPHA-D-MANNOSE	GA	F	Not available
1	43	4	ALPHA-D-MANNOSE	KA	E	Not available
1	44	4	ALPHA-D-MANNOSE	LA	E	Not available
1	45	4	ALPHA-D-MANNOSE	PA	H	Not available
1	46	4	ALPHA-D-MANNOSE	QA	H	Not available
1	47	4	ALPHA-D-MANNOSE	UA	G	Not available
1	48	4	ALPHA-D-MANNOSE	VA	G	Not available
1	49	5	water	WA	B	1

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	50	5	water	XA	F	1
1	51	5	water	YA	I	1

Datasets used for modeling

There are 6 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	De Novo model	Not available	Not available
2	3DEM volume	EMDB	EMD-14774
3	Mass Spectrometry data	PRIDE	PXD034602
4	2DEM class average	Not available	Not available
5	Other	Not available	Not available
6	Experimental model	PDB	7ZL1

Representation

This entry has only one representation and includes 0 rigid bodies and 59 flexible units

Chain ID	Rigid bodies	Non-rigid segments
A	-	1-147, 136-364
B	-	1-147, 136-364
C	-	1-147, 136-364
D	-	1-147, 136-364
E	-	1-147, 136-364
F	-	1-147, 136-364

Chain ID	Rigid bodies	Non-rigid segments
G	-	1-147, 136-364
H	-	1-147, 136-364
I	-	None-None
J	-	None-None
N	-	None-None
O	-	None-None
S	-	None-None
W	-	None-None
X	-	None-None
Y	-	None-None
CA	-	None-None
DA	-	None-None
HA	-	None-None
IA	-	None-None
MA	-	None-None
NA	-	None-None
RA	-	None-None
SA	-	None-None
K	-	None-None
P	-	None-None
T	-	None-None
Z	-	None-None
EA	-	None-None

Chain ID	Rigid bodies	Non-rigid segments
JA	-	None-None
OA	-	None-None
TA	-	None-None
L	-	None-None
M	-	None-None
Q	-	None-None
R	-	None-None
U	-	None-None
V	-	None-None
AA	-	None-None
BA	-	None-None
FA	-	None-None
GA	-	None-None
KA	-	None-None
LA	-	None-None
PA	-	None-None
QA	-	None-None
UA	-	None-None
VA	-	None-None
WA	-	1-1
XA	-	1-1
YA	-	1-1

Methodology and software ?

This entry is a result of 1 distinct protocol(s).

Step number	Protocol ID	Method name	Method type	Method description	Number of computed models	Multi state modeling	Multi scale modeling
4	1	None	None	None	None	False	False

There are 4 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
3	EMAN2	Not available	Validation - 2D variability analysis	https://pubmed.ncbi.nlm.nih.gov/27572727/
4	IMOD	Not available	validation	Not available
1	Relion	Not available	Single particle analysis	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3690530/
2	AlphaFold	Not available	structural prediction	Not available

Data quality ?

2DEM class average

Validation for this section is under development.

3DEM volume

Validation for this section is under development.

Mass Spectrometry

Validation for this section is under development.

Model quality ?

For models with atomic structures, molprobity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

Standard geometry: bond outliers ?

Bond length outliers can not be evaluated for this model

Standard geometry: angle outliers ?

Bond angle outliers do not exist or can not be evaluated for this model

Too-close contacts ?

The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all the models in this entry.

Model ID	Clash score	Number of clashes
1	5.64	255

All 255 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	H:61:ASP:OD1	H:65:ARG:NH1	0.787
1	G:61:ASP:OD1	G:65:ARG:NH1	0.752
1	B:145:ASP:O	A:150:GLN:NE2	0.747
1	D:145:ASP:O	C:150:GLN:NE2	0.731
1	E:345:ASN:O	YA:1:HOH:O	0.713
1	F:179:VAL:O	YA:1:HOH:O	0.692
1	C:345:ASN:O	YA:1:HOH:O	0.691
1	D:226:GLN:N	D:226:GLN:OE1	0.685
1	F:315:ARG:NH1	E:163:GLU:OE2	0.680
1	C:246:SER:O	YA:1:HOH:O	0.678
1	B:150:GLN:NE2	C:145:ASP:O	0.677
1	F:171:ARG:NH2	F:200:ASP:O	0.673
1	C:301:CYS:O	YA:1:HOH:O	0.673
1	A:85:PRO:O	A:87:ALA:N	0.672
1	F:121:GLU:O	G:124:ARG:NH2	0.664
1	E:363:VAL:O	YA:1:HOH:O	0.663

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	C:85:PRO:O	C:87:ALA:N	0.660
1	A:363:VAL:O	YA:1:HOH:O	0.660
1	C:309:THR:O	YA:1:HOH:O	0.658
1	G:301:CYS:SG	YA:1:HOH:O	0.655
1	C:363:VAL:O	YA:1:HOH:O	0.654
1	B:121:GLU:O	C:124:ARG:NH2	0.652
1	H:363:VAL:O	YA:1:HOH:O	0.650
1	E:206:ILE:HD13	E:222:TYR:HB3	0.648
1	C:260:GLU:N	C:260:GLU:OE1	0.643
1	E:235:GLU:O	E:238:LYS:NZ	0.642
1	G:298:ASN:OD1	G:299:GLY:N	0.642
1	C:179:VAL:O	YA:1:HOH:O	0.642
1	D:290:ILE:O	YA:1:HOH:O	0.642
1	G:260:GLU:N	G:260:GLU:OE1	0.640
1	B:309:THR:O	YA:1:HOH:O	0.640
1	D:260:GLU:N	D:260:GLU:OE1	0.638
1	F:260:GLU:N	F:260:GLU:OE1	0.638
1	B:160:ALA:O	YA:1:HOH:O	0.635
1	A:242:GLU:N	A:242:GLU:OE1	0.634
1	H:260:GLU:N	H:260:GLU:OE1	0.634
1	E:260:GLU:N	E:260:GLU:OE1	0.633
1	E:179:VAL:O	YA:1:HOH:O	0.628
1	H:242:GLU:N	H:242:GLU:OE1	0.627

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	D:61:ASP:OD1	D:65:ARG:NH1	0.625
1	E:242:GLU:N	E:242:GLU:OE1	0.624
1	F:242:GLU:N	F:242:GLU:OE1	0.623
1	C:329:GLU:N	C:329:GLU:OE1	0.621
1	F:199:THR:OG1	YA:1:HOH:O	0.621
1	G:179:VAL:O	YA:1:HOH:O	0.621
1	A:329:GLU:N	A:329:GLU:OE1	0.620
1	B:260:GLU:N	B:260:GLU:OE1	0.620
1	A:297:LYS:O	H:213:LYS:NZ	0.619
1	C:258:ASN:OD1	C:259:SER:N	0.618
1	E:204:LYS:HE2	E:206:ILE:HD11	0.617
1	C:242:GLU:N	C:242:GLU:OE1	0.617
1	C:109:ASP:OD1	C:112:ARG:NH2	0.614
1	E:315:ARG:NH1	H:163:GLU:OE2	0.614
1	F:329:GLU:N	F:329:GLU:OE1	0.614
1	H:329:GLU:N	H:329:GLU:OE1	0.614
1	B:242:GLU:N	B:242:GLU:OE1	0.613
1	A:109:ASP:OD1	A:112:ARG:NH2	0.612
1	D:242:GLU:N	D:242:GLU:OE1	0.612
1	B:4:ASP:OD2	B:70:ARG:NH2	0.609
1	G:329:GLU:N	G:329:GLU:OE1	0.609
1	E:329:GLU:N	E:329:GLU:OE1	0.607
1	F:258:ASN:OD1	F:259:SER:N	0.607

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	G:347:VAL:HG13	G:352:THR:HG21	0.602
1	A:12:ASN:OD1	A:13:LEU:N	0.601
1	C:61:ASP:OD1	C:65:ARG:NH1	0.599
1	A:347:VAL:HG13	A:352:THR:HG21	0.596
1	G:38:GLU:N	G:38:GLU:OE1	0.596
1	F:170:MET:N	F:170:MET:SD	0.594
1	H:170:MET:N	H:170:MET:SD	0.594
1	G:258:ASN:OD1	G:259:SER:N	0.592
1	H:315:ARG:NH1	G:163:GLU:OE2	0.592
1	D:258:ASN:OD1	D:259:SER:N	0.589
1	H:38:GLU:N	H:38:GLU:OE1	0.588
1	F:347:VAL:HG13	F:352:THR:HG21	0.586
1	B:258:ASN:OD1	B:259:SER:N	0.586
1	E:258:ASN:OD1	E:259:SER:N	0.584
1	A:246:SER:O	YA:1:HOH:O	0.582
1	D:38:GLU:N	D:38:GLU:OE1	0.581
1	H:347:VAL:HG13	H:352:THR:HG21	0.578
1	A:315:ARG:NH1	D:163:GLU:OE2	0.570
1	B:215:ASN:ND2	B:218:GLU:OE2	0.570
1	C:38:GLU:N	C:38:GLU:OE1	0.569
1	F:319:PHE:CE2	F:347:VAL:HG11	0.568
1	H:79:ALA:O	H:83:ALA:N	0.567
1	A:319:PHE:CE2	A:347:VAL:HG11	0.566

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	C:213:LYS:NZ	F:297:LYS:O	0.566
1	E:145:ASP:O	H:150:GLN:NE2	0.563
1	H:319:PHE:CE2	H:347:VAL:HG11	0.561
1	C:347:VAL:HG13	C:352:THR:HG21	0.558
1	F:124:ARG:NH2	E:121:GLU:O	0.558
1	A:236:GLU:N	A:236:GLU:OE1	0.556
1	G:215:ASN:ND2	G:218:GLU:OE2	0.551
1	B:231:VAL:HG13	B:237:ASN:O	0.549
1	B:297:LYS:O	G:213:LYS:NZ	0.547
1	H:244:MET:N	H:244:MET:SD	0.547
1	A:231:VAL:HG13	A:237:ASN:O	0.546
1	C:244:MET:HB3	C:268:VAL:HG11	0.545
1	G:109:ASP:OD1	G:112:ARG:NH2	0.545
1	B:244:MET:N	B:244:MET:SD	0.543
1	B:315:ARG:NH1	A:163:GLU:OE1	0.539
1	B:131:ALA:O	B:135:VAL:HG23	0.537
1	C:319:PHE:CE2	C:347:VAL:HG11	0.537
1	D:180:HIS:ND1	E:302:VAL:HG13	0.537
1	C:236:GLU:N	C:236:GLU:OE1	0.536
1	E:231:VAL:HG13	E:237:ASN:O	0.534
1	G:79:ALA:O	G:83:ALA:N	0.534
1	A:11:VAL:HG11	D:57:LEU:HD13	0.533
1	G:319:PHE:CE2	G:347:VAL:HG11	0.531

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	D:85:PRO:O	D:87:ALA:N	0.531
1	D:138:GLU:OE1	C:143:ARG:NH1	0.530
1	B:124:ARG:NH2	A:121:GLU:O	0.523
1	B:51:MET:SD	B:54:ARG:NH2	0.516
1	B:85:PRO:O	B:87:ALA:N	0.516
1	F:163:GLU:OE2	G:315:ARG:NH1	0.515
1	B:236:GLU:N	B:236:GLU:OE1	0.513
1	E:124:ARG:NH2	H:121:GLU:O	0.510
1	F:173:LYS:O	F:306:PHE:N	0.509
1	A:258:ASN:OD1	A:259:SER:N	0.508
1	A:75:LEU:O	A:75:LEU:HD23	0.507
1	E:244:MET:N	E:244:MET:SD	0.507
1	D:180:HIS:CE1	E:302:VAL:HG13	0.505
1	H:258:ASN:OD1	H:259:SER:N	0.505
1	F:236:GLU:N	F:236:GLU:OE1	0.504
1	G:85:PRO:O	G:87:ALA:N	0.503
1	E:151:GLY:O	E:155:ARG:NH1	0.501
1	F:300:CYS:SG	F:301:CYS:N	0.500
1	A:17:ILE:HG21	A:55:MET:HE1	0.498
1	B:149:VAL:HG23	A:150:GLN:NE2	0.497
1	C:131:ALA:O	C:135:VAL:HG23	0.495
1	H:152:TRP:NE1	G:156:SER:OG	0.494
1	E:204:LYS:CE	E:206:ILE:HD11	0.489

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	H:152:TRP:CD1	G:156:SER:HG	0.488
1	E:300:CYS:SG	E:301:CYS:N	0.485
1	H:138:GLU:OE1	G:143:ARG:NH1	0.485
1	B:63:VAL:HG22	A:65:ARG:NH2	0.482
1	H:171:ARG:NH2	H:200:ASP:O	0.482
1	C:12:ASN:OD1	C:13:LEU:N	0.480
1	A:244:MET:HB3	A:268:VAL:HG11	0.478
1	E:228:ILE:N	E:228:ILE:HD12	0.478
1	E:302:VAL:O	E:302:VAL:HG12	0.478
1	H:298:ASN:ND2	H:305:GLY:O	0.478
1	H:124:ARG:NH2	G:121:GLU:O	0.476
1	E:231:VAL:HG22	E:238:LYS:HG2	0.475
1	F:298:ASN:OD1	F:299:GLY:N	0.475
1	D:253:LEU:HD23	D:268:VAL:HG13	0.474
1	D:298:ASN:ND2	D:305:GLY:O	0.474
1	E:109:ASP:OD1	E:112:ARG:NH2	0.474
1	H:51:MET:SD	H:54:ARG:NH2	0.472
1	E:236:GLU:N	E:236:GLU:OE1	0.472
1	B:131:ALA:HB1	A:132:LEU:HD13	0.471
1	C:75:LEU:O	C:75:LEU:HD23	0.468
1	F:221:LEU:HD13	F:230:PHE:HD1	0.468
1	G:71:LEU:O	G:71:LEU:HD23	0.467
1	D:131:ALA:O	D:135:VAL:HG23	0.466

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	F:79:ALA:O	F:83:ALA:N	0.466
1	A:131:ALA:HB1	D:132:LEU:HD13	0.465
1	E:347:VAL:HG13	E:352:THR:HG21	0.465
1	D:345:ASN:OD1	D:346:ILE:N	0.465
1	E:85:PRO:O	E:87:ALA:N	0.465
1	E:79:ALA:O	E:83:ALA:N	0.465
1	A:131:ALA:O	A:135:VAL:HG23	0.464
1	H:328:ASN:O	H:332:ARG:NH1	0.464
1	E:296:GLU:O	E:298:ASN:N	0.463
1	F:204:LYS:N	YA:1:HOH:O	0.463
1	B:179:VAL:O	YA:1:HOH:O	0.462
1	C:71:LEU:O	C:71:LEU:HD23	0.461
1	A:328:ASN:O	A:332:ARG:NH1	0.461
1	B:75:LEU:O	B:75:LEU:HD23	0.459
1	B:363:VAL:O	YA:1:HOH:O	0.459
1	B:342:ILE:N	B:342:ILE:HD12	0.458
1	F:4:ASP:OD2	F:70:ARG:NH2	0.458
1	H:307:ASP:OD1	H:308:GLU:N	0.457
1	G:231:VAL:HG13	G:237:ASN:O	0.456
1	B:232:VAL:HG11	B:257:TRP:CE2	0.454
1	E:12:ASN:OD1	E:13:LEU:N	0.451
1	D:319:PHE:CE2	D:347:VAL:HG11	0.450
1	E:328:ASN:O	E:332:ARG:NH1	0.448

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	G:354:ILE:O	G:362:TYR:OH	0.447
1	B:132:LEU:HD13	C:131:ALA:HB1	0.446
1	B:197:LYS:NZ	A:163:GLU:OE2	0.445
1	D:236:GLU:N	D:236:GLU:OE1	0.445
1	C:232:VAL:HG11	C:257:TRP:CE2	0.442
1	E:228:ILE:HD11	E:245:VAL:HG13	0.442
1	A:124:ARG:NH2	D:121:GLU:O	0.442
1	H:236:GLU:N	H:236:GLU:OE1	0.442
1	C:17:ILE:HD11	C:52:ARG:CZ	0.441
1	E:345:ASN:OD1	E:346:ILE:N	0.441
1	A:88:PRO:O	A:90:ALA:N	0.440
1	A:171:ARG:HH11	D:351:VAL:HG13	0.438
1	E:319:PHE:CE2	E:347:VAL:HG11	0.437
1	C:207:LEU:O	C:294:GLY:N	0.437
1	F:221:LEU:HD12	F:229:VAL:O	0.436
1	H:113:ARG:NH1	G:111:GLY:O	0.436
1	H:345:ASN:OD1	H:346:ILE:N	0.436
1	B:307:ASP:OD1	B:308:GLU:N	0.434
1	C:177:GLY:O	C:293:ILE:N	0.432
1	E:228:ILE:HD11	E:245:VAL:CG1	0.431
1	F:345:ASN:OD1	F:346:ILE:N	0.431
1	D:75:LEU:O	D:75:LEU:HD23	0.430
1	H:222:TYR:OH	H:229:VAL:HG11	0.428

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	E:298:ASN:ND2	YA:1:HOH:O	0.428
1	B:345:ASN:OD1	B:346:ILE:N	0.427
1	F:51:MET:SD	F:54:ARG:NH2	0.427
1	D:74:GLU:OE2	C:72:ARG:NE	0.427
1	B:253:LEU:HD22	B:268:VAL:HG22	0.424
1	D:131:ALA:HB1	C:132:LEU:HD13	0.423
1	C:290:ILE:HD12	C:297:LYS:NZ	0.423
1	E:75:LEU:O	E:75:LEU:HD23	0.423
1	H:253:LEU:CD2	H:268:VAL:HG13	0.423
1	H:319:PHE:HE2	H:347:VAL:HG11	0.423
1	D:215:ASN:ND2	D:218:GLU:OE2	0.423
1	D:300:CYS:SG	D:301:CYS:SG	0.422
1	D:253:LEU:CD2	D:268:VAL:HG13	0.421
1	F:319:PHE:HE2	F:347:VAL:HG11	0.421
1	H:74:GLU:OE2	G:72:ARG:NE	0.421
1	D:331:ILE:O	D:334:THR:OG1	0.420
1	G:12:ASN:OD1	G:13:LEU:N	0.419
1	G:345:ASN:OD1	G:346:ILE:N	0.419
1	B:222:TYR:OH	B:229:VAL:HG11	0.418
1	F:307:ASP:OD1	F:308:GLU:N	0.418
1	H:152:TRP:NE1	G:156:SER:HG	0.418
1	B:351:VAL:HG13	C:171:ARG:HH11	0.416
1	F:328:ASN:O	F:332:ARG:NH1	0.416

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	D:51:MET:SD	D:54:ARG:NH2	0.415
1	C:328:ASN:O	C:332:ARG:NH1	0.414
1	G:236:GLU:N	G:236:GLU:OE1	0.414
1	C:319:PHE:HE2	C:347:VAL:HG11	0.413
1	E:215:ASN:ND2	E:218:GLU:OE2	0.413
1	H:290:ILE:O	YA:1:HOH:O	0.413
1	A:319:PHE:HE2	A:347:VAL:HG11	0.411
1	A:345:ASN:OD1	A:346:ILE:N	0.411
1	C:290:ILE:HD11	F:299:GLY:HA3	0.410
1	D:244:MET:HB3	D:268:VAL:HG11	0.406
1	H:75:LEU:O	H:75:LEU:HD23	0.404
1	F:215:ASN:ND2	F:218:GLU:OE2	0.403
1	H:85:PRO:O	H:87:ALA:N	0.402

Torsion angles: Protein backbone ?

In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	2896	2542	321	33

Detailed list of outliers are tabulated below.

Torsion angles: Protein sidechains ?

In the following table, sidechain outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	2360	2336	16	8

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
----------	-------	------------	--------------

Model ID	Chain	Residue ID	Residue type
1	A	203	ASN
1	B	213	LYS
1	C	203	ASN
1	D	213	LYS
1	F	86	CYS
1	F	170	MET
1	H	170	MET
1	H	301	CYS

Fit of model to data used for modeling ?

2DEM class average

Validation for this section is under development.

3DEM volume

Validation for this section is under development.

Mass Spectrometry

Validation for this section is under development.

Fit of model to data used for validation ?

Validation for this section is under development.

Acknowledgements

Development of integrative model validation metrics, implementation of a model validation pipeline, and creation of a validation report for integrative structures, are funded by NSF ABI awards (DBI-1756248, DBI-2112966, DBI-2112967, DBI-2112968, and DBI-1756250). The [PDB-Dev team](#) and members of [Sali lab](#) contributed model validation metrics and software packages.

Implementation of validation methods for SAS data and SAS-based models are funded by [RCSB PDB](#) (grant number DBI-1832184). Dr. Stephen Burley, Dr. John Westbrook, and Dr. Jasmine Young from [RCSB PDB](#), Dr. Jill Trehella, Dr. Dina Schneidman, and members of the [SASBDB](#) repository are acknowledged for their advice and support in implementing SAS validation methods.

Members of the [wwPDB Integrative/Hybrid Methods Task Force](#) provided recommendations and community support for the project.