



wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 24, 2023 – 07:22 PM EDT

PDB ID : 5UOE
Title : Crystal Structure Analysis of Elbow-Engineered-Fab-Bound Human Insulin Degrading Enzyme (IDE)
Authors : Liang, W.G.; Bailey, L.; Kossiakoff, T.; Tang, W.J.
Deposited on : 2017-01-31
Resolution : 3.80 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 : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.35.1
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

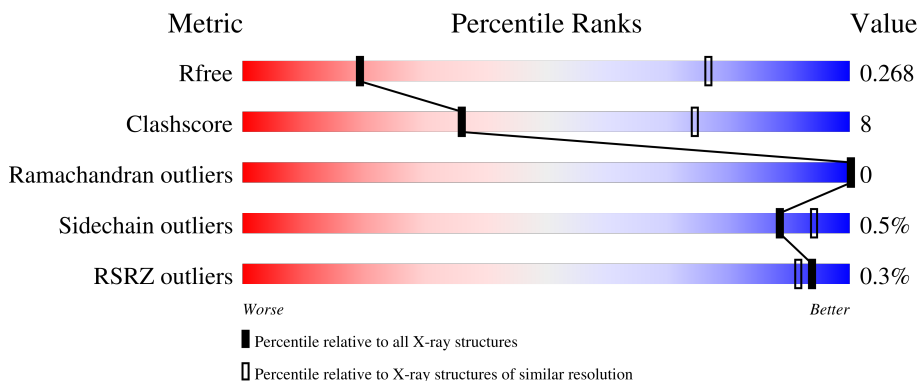
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.80 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.



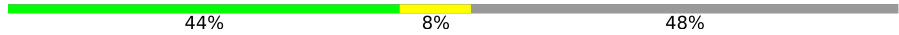


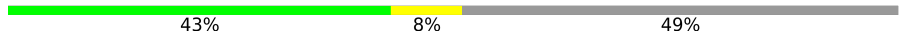






Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1212 (4.00-3.60)
Clashscore	141614	1288 (4.00-3.60)
Ramachandran outliers	138981	1243 (4.00-3.60)
Sidechain outliers	138945	1237 (4.00-3.60)
RSRZ outliers	127900	1121 (4.00-3.60)

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	990	 79% 17% .
1	B	990	 79% 17% .
1	C	990	 75% 21% .
1	D	990	 76% 20% .
1	E	990	 77% 19% .

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Mol	Chain	Length	Quality of chain
2	H	229	
2	M	229	
2	P	229	
2	S	229	
2	V	229	
3	L	215	
3	N	215	
3	Q	215	
3	T	215	
3	W	215	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 47331 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 Insulin-degrading enzyme.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	953	7762	5003	1302	1435	22	0	0	0
1	B	952	7752	4997	1303	1430	22	0	0	0
1	C	953	7770	5009	1308	1431	22	0	0	0
1	D	953	7764	5006	1307	1429	22	0	0	0
1	E	953	7764	5006	1307	1429	22	0	0	0

There are 125 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	30	MET	-	expression tag	UNP P14735
A	31	HIS	-	expression tag	UNP P14735
A	32	HIS	-	expression tag	UNP P14735
A	33	HIS	-	expression tag	UNP P14735
A	34	HIS	-	expression tag	UNP P14735
A	35	HIS	-	expression tag	UNP P14735
A	36	HIS	-	expression tag	UNP P14735
A	37	ALA	-	expression tag	UNP P14735
A	38	ALA	-	expression tag	UNP P14735
A	39	GLY	-	expression tag	UNP P14735
A	40	ILE	-	expression tag	UNP P14735
A	41	PRO	-	expression tag	UNP P14735
A	110	LEU	CYS	engineered mutation	UNP P14735
A	171	SER	CYS	engineered mutation	UNP P14735
A	178	ALA	CYS	engineered mutation	UNP P14735
A	257	VAL	CYS	engineered mutation	UNP P14735
A	414	LEU	CYS	engineered mutation	UNP P14735
A	573	ASN	CYS	engineered mutation	UNP P14735
A	590	SER	CYS	engineered mutation	UNP P14735

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Chain	Residue	Modelled	Actual	Comment	Reference
A	789	SER	CYS	engineered mutation	UNP P14735
A	812	ALA	CYS	engineered mutation	UNP P14735
A	819	ALA	CYS	engineered mutation	UNP P14735
A	904	SER	CYS	engineered mutation	UNP P14735
A	966	ASN	CYS	engineered mutation	UNP P14735
A	974	ALA	CYS	engineered mutation	UNP P14735
B	30	MET	-	expression tag	UNP P14735
B	31	HIS	-	expression tag	UNP P14735
B	32	HIS	-	expression tag	UNP P14735
B	33	HIS	-	expression tag	UNP P14735
B	34	HIS	-	expression tag	UNP P14735
B	35	HIS	-	expression tag	UNP P14735
B	36	HIS	-	expression tag	UNP P14735
B	37	ALA	-	expression tag	UNP P14735
B	38	ALA	-	expression tag	UNP P14735
B	39	GLY	-	expression tag	UNP P14735
B	40	ILE	-	expression tag	UNP P14735
B	41	PRO	-	expression tag	UNP P14735
B	110	LEU	CYS	engineered mutation	UNP P14735
B	171	SER	CYS	engineered mutation	UNP P14735
B	178	ALA	CYS	engineered mutation	UNP P14735
B	257	VAL	CYS	engineered mutation	UNP P14735
B	414	LEU	CYS	engineered mutation	UNP P14735
B	573	ASN	CYS	engineered mutation	UNP P14735
B	590	SER	CYS	engineered mutation	UNP P14735
B	789	SER	CYS	engineered mutation	UNP P14735
B	812	ALA	CYS	engineered mutation	UNP P14735
B	819	ALA	CYS	engineered mutation	UNP P14735
B	904	SER	CYS	engineered mutation	UNP P14735
B	966	ASN	CYS	engineered mutation	UNP P14735
B	974	ALA	CYS	engineered mutation	UNP P14735
C	30	MET	-	expression tag	UNP P14735
C	31	HIS	-	expression tag	UNP P14735
C	32	HIS	-	expression tag	UNP P14735
C	33	HIS	-	expression tag	UNP P14735
C	34	HIS	-	expression tag	UNP P14735
C	35	HIS	-	expression tag	UNP P14735
C	36	HIS	-	expression tag	UNP P14735
C	37	ALA	-	expression tag	UNP P14735
C	38	ALA	-	expression tag	UNP P14735
C	39	GLY	-	expression tag	UNP P14735
C	40	ILE	-	expression tag	UNP P14735

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Chain	Residue	Modelled	Actual	Comment	Reference
C	41	PRO	-	expression tag	UNP P14735
C	110	LEU	CYS	engineered mutation	UNP P14735
C	171	SER	CYS	engineered mutation	UNP P14735
C	178	ALA	CYS	engineered mutation	UNP P14735
C	257	VAL	CYS	engineered mutation	UNP P14735
C	414	LEU	CYS	engineered mutation	UNP P14735
C	573	ASN	CYS	engineered mutation	UNP P14735
C	590	SER	CYS	engineered mutation	UNP P14735
C	789	SER	CYS	engineered mutation	UNP P14735
C	812	ALA	CYS	engineered mutation	UNP P14735
C	819	ALA	CYS	engineered mutation	UNP P14735
C	904	SER	CYS	engineered mutation	UNP P14735
C	966	ASN	CYS	engineered mutation	UNP P14735
C	974	ALA	CYS	engineered mutation	UNP P14735
D	30	MET	-	expression tag	UNP P14735
D	31	HIS	-	expression tag	UNP P14735
D	32	HIS	-	expression tag	UNP P14735
D	33	HIS	-	expression tag	UNP P14735
D	34	HIS	-	expression tag	UNP P14735
D	35	HIS	-	expression tag	UNP P14735
D	36	HIS	-	expression tag	UNP P14735
D	37	ALA	-	expression tag	UNP P14735
D	38	ALA	-	expression tag	UNP P14735
D	39	GLY	-	expression tag	UNP P14735
D	40	ILE	-	expression tag	UNP P14735
D	41	PRO	-	expression tag	UNP P14735
D	110	LEU	CYS	engineered mutation	UNP P14735
D	171	SER	CYS	engineered mutation	UNP P14735
D	178	ALA	CYS	engineered mutation	UNP P14735
D	257	VAL	CYS	engineered mutation	UNP P14735
D	414	LEU	CYS	engineered mutation	UNP P14735
D	573	ASN	CYS	engineered mutation	UNP P14735
D	590	SER	CYS	engineered mutation	UNP P14735
D	789	SER	CYS	engineered mutation	UNP P14735
D	812	ALA	CYS	engineered mutation	UNP P14735
D	819	ALA	CYS	engineered mutation	UNP P14735
D	904	SER	CYS	engineered mutation	UNP P14735
D	966	ASN	CYS	engineered mutation	UNP P14735
D	974	ALA	CYS	engineered mutation	UNP P14735
E	30	MET	-	expression tag	UNP P14735
E	31	HIS	-	expression tag	UNP P14735
E	32	HIS	-	expression tag	UNP P14735

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Chain	Residue	Modelled	Actual	Comment	Reference
E	33	HIS	-	expression tag	UNP P14735
E	34	HIS	-	expression tag	UNP P14735
E	35	HIS	-	expression tag	UNP P14735
E	36	HIS	-	expression tag	UNP P14735
E	37	ALA	-	expression tag	UNP P14735
E	38	ALA	-	expression tag	UNP P14735
E	39	GLY	-	expression tag	UNP P14735
E	40	ILE	-	expression tag	UNP P14735
E	41	PRO	-	expression tag	UNP P14735
E	110	LEU	CYS	engineered mutation	UNP P14735
E	171	SER	CYS	engineered mutation	UNP P14735
E	178	ALA	CYS	engineered mutation	UNP P14735
E	257	VAL	CYS	engineered mutation	UNP P14735
E	414	LEU	CYS	engineered mutation	UNP P14735
E	573	ASN	CYS	engineered mutation	UNP P14735
E	590	SER	CYS	engineered mutation	UNP P14735
E	789	SER	CYS	engineered mutation	UNP P14735
E	812	ALA	CYS	engineered mutation	UNP P14735
E	819	ALA	CYS	engineered mutation	UNP P14735
E	904	SER	CYS	engineered mutation	UNP P14735
E	966	ASN	CYS	engineered mutation	UNP P14735
E	974	ALA	CYS	engineered mutation	UNP P14735

- Molecule 2 is a protein called FAB Heavy chain with engineered elbow.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	119	Total	C	N	O	S	0	0	0
			901	568	153	177	3			
2	M	117	Total	C	N	O	S	0	0	0
			882	555	150	174	3			
2	P	118	Total	C	N	O	S	0	0	0
			893	564	151	175	3			
2	S	117	Total	C	N	O	S	0	0	0
			882	555	150	174	3			
2	V	117	Total	C	N	O	S	0	0	0
			881	555	150	173	3			

- Molecule 3 is a protein called FAB light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	L	108	Total	C	N	O	S	0	0	0
			820	516	136	165	3			

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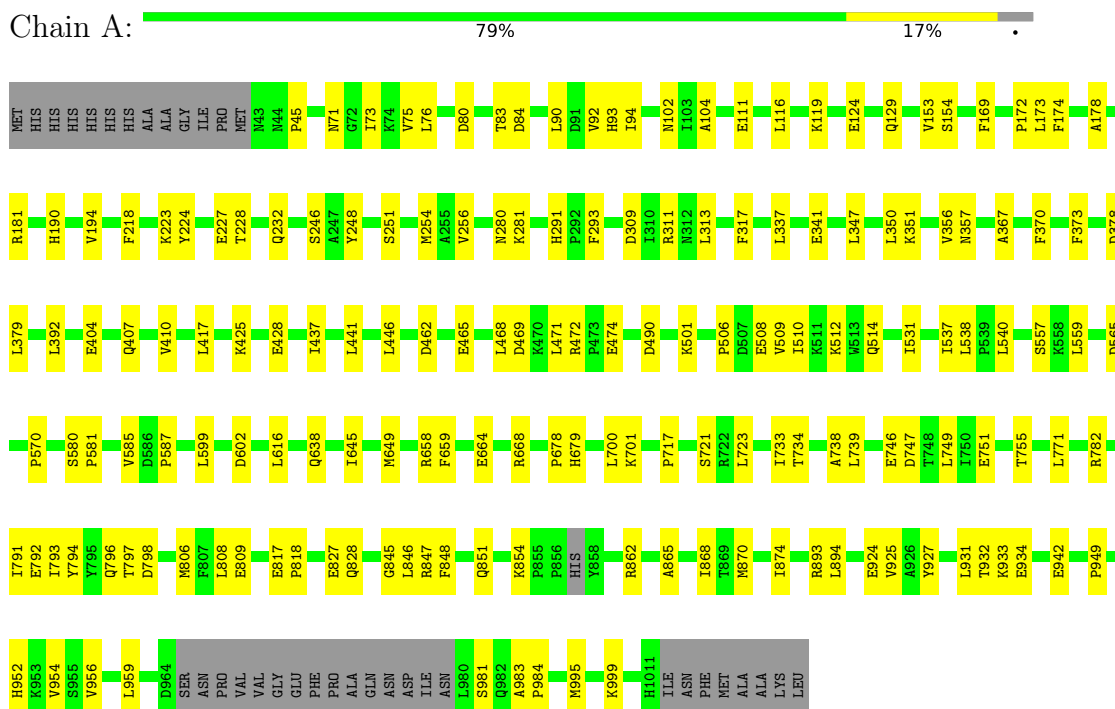
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	N	109	Total	C	N	O	S	0	0	0
			827	520	137	167	3			
3	Q	108	Total	C	N	O	S	0	0	0
			820	516	136	165	3			
3	T	107	Total	C	N	O	S	0	0	0
			815	513	135	164	3			
3	W	105	Total	C	N	O	S	0	0	0
			798	501	132	162	3			

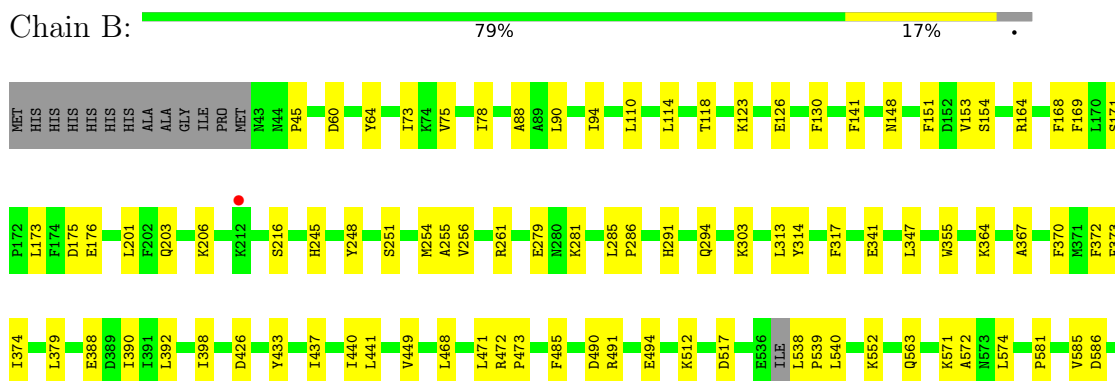
3 Residue-property plots

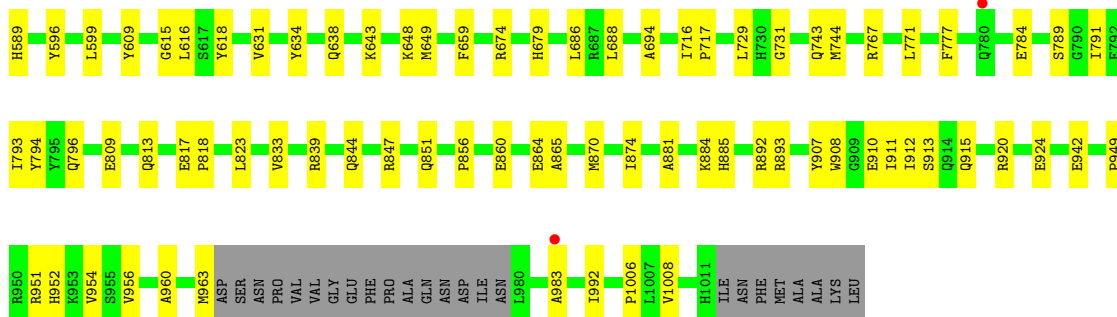
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Insulin-degrading enzyme

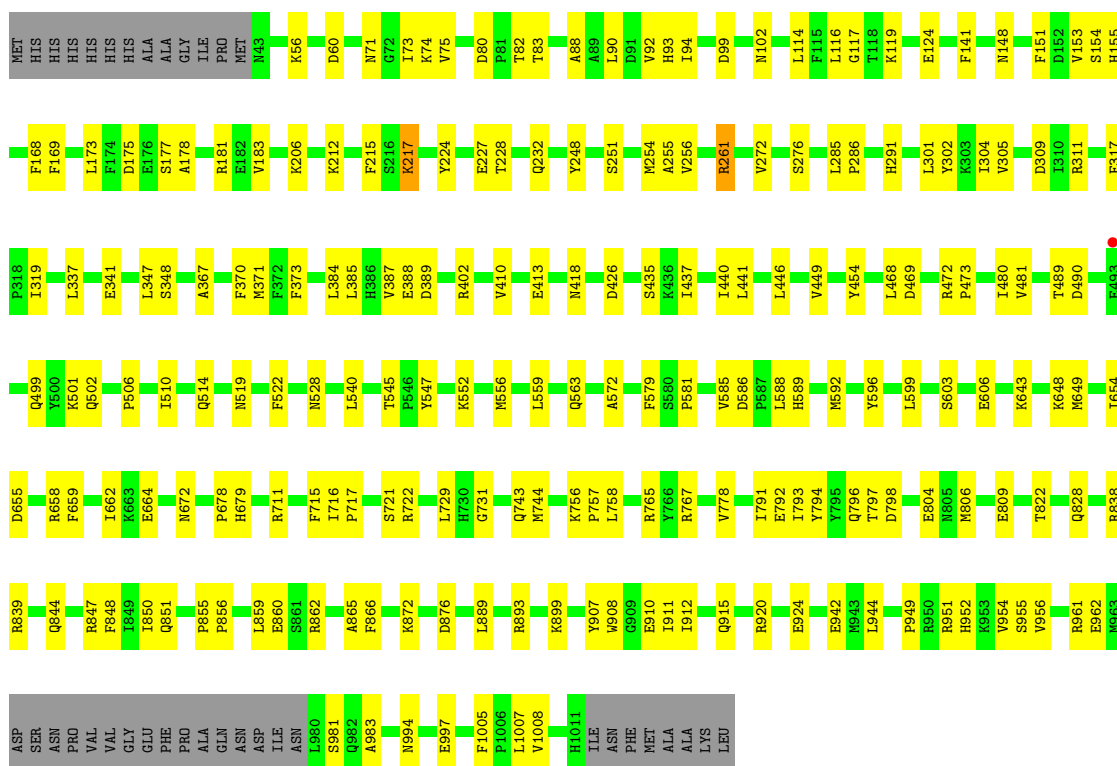


- Molecule 1: Insulin-degrading enzyme

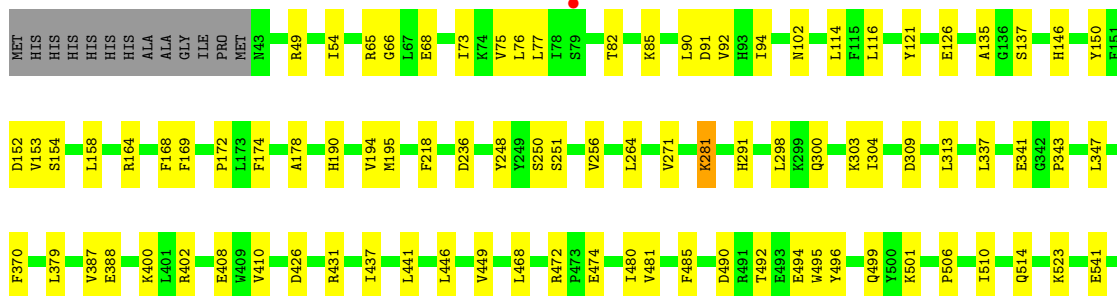
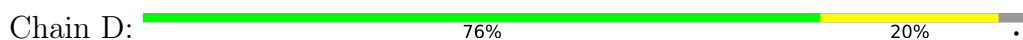


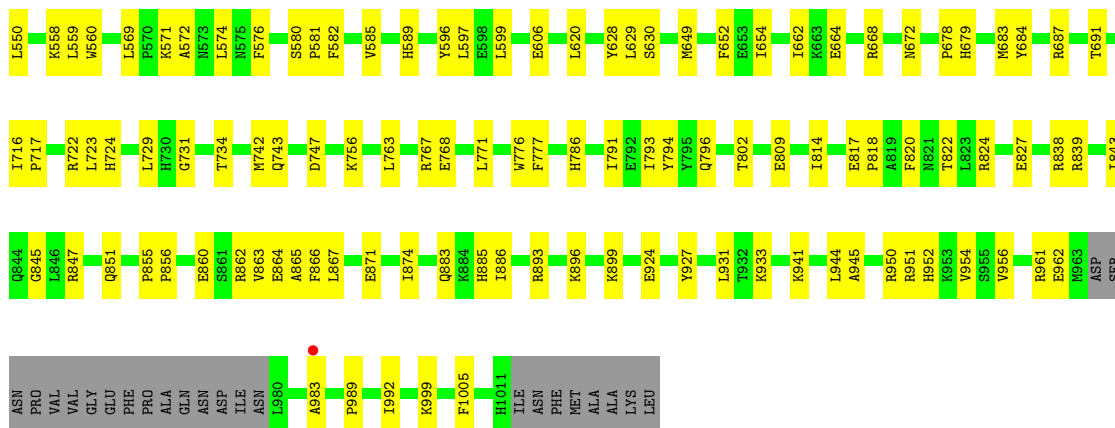


● Molecule 1: Insulin-degrading enzyme

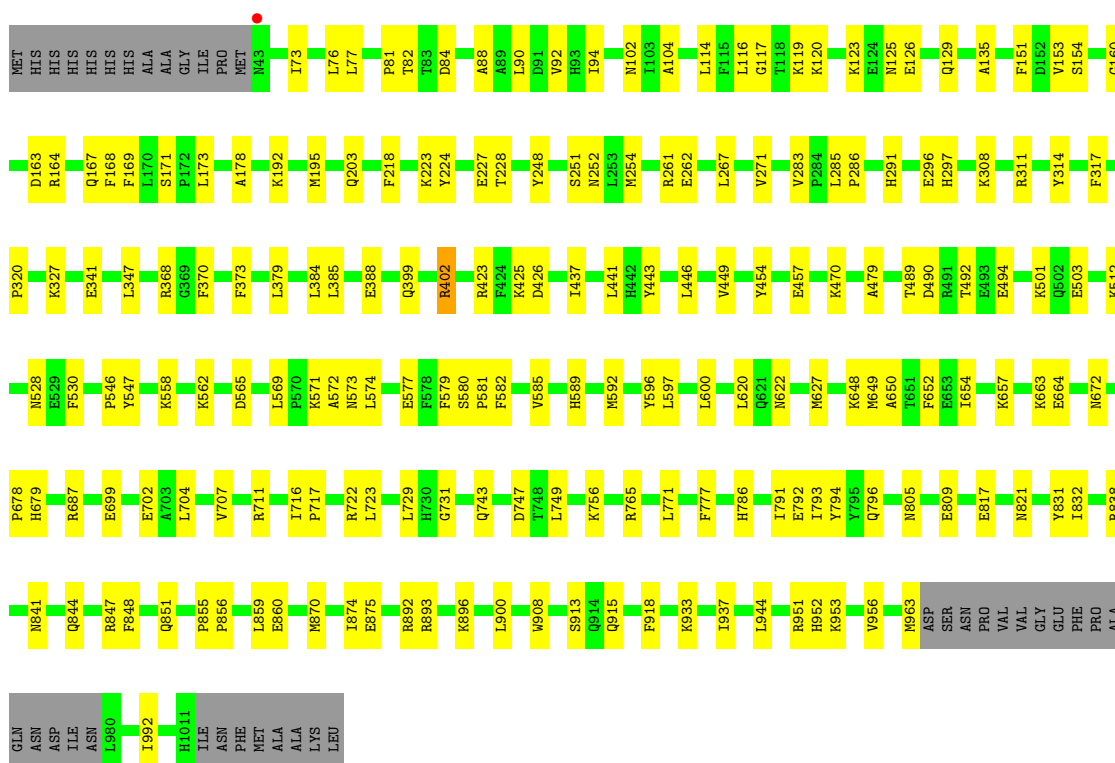
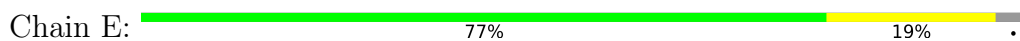


● Molecule 1: Insulin-degrading enzyme

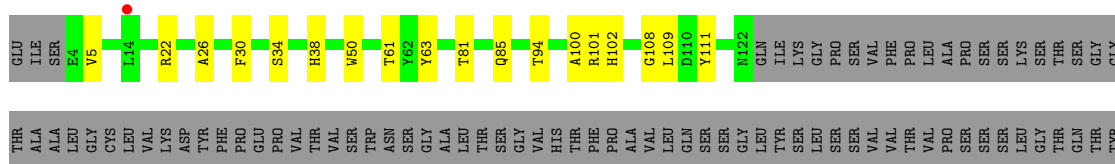




• Molecule 1: Insulin-degrading enzyme

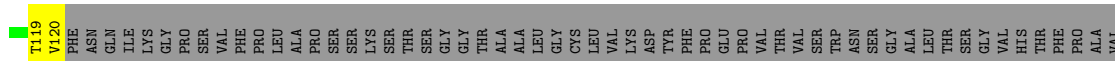
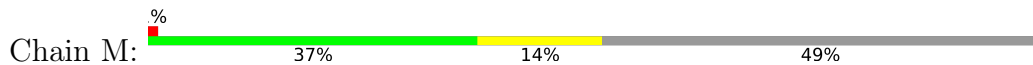


• Molecule 2: FAB Heavy chain with engineered elbow



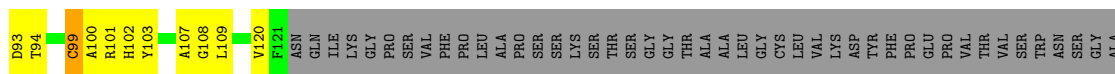
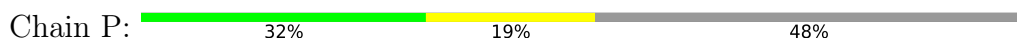
ILE	CYS	ASN	VAL	ASN	HIS	LYS	PRO	SER	THR	LYS	VAL	ASP	LYS	LYS	LYS	VAL	GLY	PRO	LYS	CYS	ASP	LYS	THR	HIS	THR
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● Molecule 2: FAB Heavy chain with engineered elbow



LEU	GLN	SER	GLY	LEU	TYR	SER	LEU	SER	SER	VAL	VAL	THR	VAL	PRO	ALA	PRO	GLN	SER	SER	LYS	LEU	GLY	SER	ILE	CYS	ALA	ASN	VAL	LYS	ASN	LYS	PRO	VAL	THR	ASN	LYS	THR	CYS	ASP	GLY	LYS	ALA	LEU	THR	HIS	THR
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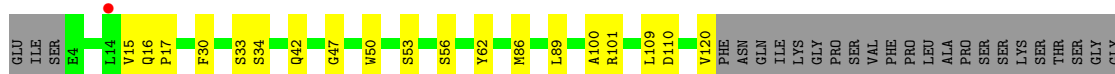
● Molecule 2: FAB Heavy chain with engineered elbow



LEU	THR	GLY	VAL	HIS	THR	PHE	PRO	ALA	VAL	LEU	GLN	SER	SER	GLY	TYR	SER	LEU	SER	VAL	VAL	VAL	PRO	SER	SER	LYS	GLY	THR	GLN	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

THR	HIS	THR
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● Molecule 2: FAB Heavy chain with engineered elbow



THR	ALA	ALA	CYS	GLY	LEU	VAL	LYS	ASP	TYR	PHE	PRO	GLU	PRO	VAL	VAL	THR	VAL	VAL	TRP	ASN	SER	GLY	ALA	LEU	THR	PHE	VAL	VAL	GLN	SER	SER	GLY	VAL	HIS	THR	PRO	ALA	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

ILE	CYS	ASN	VAL	HIS	LYS	PRO	SER	THR	LYS	VAL	ASP	LYS	LYS	VAL	VAL	GLU	PRO	LYS	SER	ASN	ASP	LYS	THR	HIS	THR
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----


● Molecule 2: FAB Heavy chain with engineered elbow



ALA
ALA
PRO
SER
SER
VAL
PHE
ILE
PHE
PRO
LEU
SER
SER
ASP
SER
SER
GLN
LEU
LEU
LYS
LYS
GLY
GLY
THR
ALA
VAL
VAL
CYS
LEU
LEU
ASN
ASN
PHE
GLY
TYR
PRO
ARG
SER
GLU
ALA
LYS
VAL
GLN
GLN
TRP
LYS
PHE
ASN
ASP
ASN
ALA
LEU
LEU
GLN

SER
THR
TYR
SER
LEU
SER
SER
THR
THR
LEU
PRO
SER
SER
LYS
ALA
ASP
TYR
GLY
GLY
HIS
LYS
VAL
SER
TYR
ALA
VAL
CYS
GLY
VAL
THR
THR
HIS
GLN
GLY
LEU
SER
SER
PRO
VAL
THR
LYS
SER
PHE
ASN
ARG
GLY
GLY
CYS

● Molecule 3: FAB light chain

Chain W:  34% 14% 51%

SER
D2
I3
S8
P9
S10
S11
L12
S15
D18
R19
L22
R25
A26
S27
Q28
A33
Y37
Q38
Q39
K40
P45
K46
S51
A52
D71
T75
L79
Q90
Q91
S92
T93
F94
I97
T98
T103
K104
V105
E106
ILE
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ARG
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ALA

ALA
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GLY
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LEU
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SER
PRO
VAL
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LYS
SER
PHE
ASN
ARG
GLY
GLY
CYS

4 Data and refinement statistics

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α , β , γ	131.32Å 242.05Å 310.76Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.24 – 3.80 49.24 – 3.79	Depositor EDS
% Data completeness (in resolution range)	99.8 (49.24-3.80) 91.4 (49.24-3.79)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.76 (at 3.77Å)	Xtrriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.220 , 0.270 0.220 , 0.268	Depositor DCC
R_{free} test set	2000 reflections (2.03%)	wwPDB-VP
Wilson B-factor (Å ²)	69.1	Xtrriage
Anisotropy	0.712	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 30.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	47331	wwPDB-VP
Average B, all atoms (Å ²)	77.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 18.68% 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](#)

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	0.26	0/7955	0.42	0/10764
1	B	0.26	0/7946	0.42	0/10752
1	C	0.27	0/7965	0.43	0/10777
1	D	0.26	0/7959	0.42	0/10771
1	E	0.26	0/7959	0.42	0/10771
2	H	0.28	0/922	0.50	0/1253
2	M	0.26	0/902	0.50	0/1226
2	P	0.26	0/914	0.48	0/1242
2	S	0.26	0/902	0.47	0/1226
2	V	0.29	0/901	0.51	0/1224
3	L	0.35	0/838	0.55	1/1137 (0.1%)
3	N	0.28	0/845	0.50	0/1147
3	Q	0.35	0/838	0.53	0/1137
3	T	0.27	0/833	0.49	0/1130
3	W	0.29	0/816	0.54	0/1108
All	All	0.27	0/48495	0.44	1/65665 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
3	L	93	TYR	C-N-CA	-5.01	109.18	121.70

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	A	7762	0	7681	98	0
1	B	7752	0	7669	100	0
1	C	7770	0	7703	132	0
1	D	7764	0	7695	120	0
1	E	7764	0	7695	114	0
2	H	901	0	856	16	0
2	M	882	0	841	28	0
2	P	893	0	850	38	0
2	S	882	0	841	14	0
2	V	881	0	840	21	0
3	L	820	0	797	19	0
3	N	827	0	804	16	0
3	Q	820	0	797	26	0
3	T	815	0	795	29	0
3	W	798	0	771	23	0
All	All	47331	0	46635	755	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.

The worst 5 of 755 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:C:402:ARG:HG3	1:C:468:LEU:HD21	1.46	0.97
1:E:716:ILE:HB	1:E:717:PRO:HD3	1.58	0.86
3:W:3:ILE:HG13	3:W:27:SER:HB3	1.60	0.84
1:C:599:LEU:HD23	1:C:662:ILE:HD12	1.61	0.83
1:C:893:ARG:HG3	1:C:893:ARG:HH11	1.42	0.82

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	A	947/990 (96%)	924 (98%)	23 (2%)	0	100	100
1	B	946/990 (96%)	922 (98%)	24 (2%)	0	100	100
1	C	949/990 (96%)	923 (97%)	26 (3%)	0	100	100
1	D	949/990 (96%)	926 (98%)	23 (2%)	0	100	100
1	E	949/990 (96%)	919 (97%)	30 (3%)	0	100	100
2	H	117/229 (51%)	110 (94%)	7 (6%)	0	100	100
2	M	115/229 (50%)	109 (95%)	6 (5%)	0	100	100
2	P	116/229 (51%)	110 (95%)	6 (5%)	0	100	100
2	S	115/229 (50%)	109 (95%)	6 (5%)	0	100	100
2	V	115/229 (50%)	108 (94%)	7 (6%)	0	100	100
3	L	106/215 (49%)	97 (92%)	9 (8%)	0	100	100
3	N	107/215 (50%)	103 (96%)	4 (4%)	0	100	100
3	Q	106/215 (49%)	99 (93%)	7 (7%)	0	100	100
3	T	105/215 (49%)	99 (94%)	6 (6%)	0	100	100
3	W	103/215 (48%)	96 (93%)	7 (7%)	0	100	100
All	All	5845/7170 (82%)	5654 (97%)	191 (3%)	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	A	840/879 (96%)	837 (100%)	3 (0%)	91	95
1	B	838/879 (95%)	837 (100%)	1 (0%)	93	97
1	C	841/879 (96%)	837 (100%)	4 (0%)	88	94
1	D	840/879 (96%)	838 (100%)	2 (0%)	93	97
1	E	840/879 (96%)	835 (99%)	5 (1%)	86	92
2	H	94/191 (49%)	94 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	M	92/191 (48%)	91 (99%)	1 (1%)	73	85
2	P	93/191 (49%)	92 (99%)	1 (1%)	73	85
2	S	92/191 (48%)	92 (100%)	0	100	100
2	V	92/191 (48%)	92 (100%)	0	100	100
3	L	93/190 (49%)	90 (97%)	3 (3%)	39	65
3	N	94/190 (50%)	92 (98%)	2 (2%)	53	74
3	Q	93/190 (49%)	92 (99%)	1 (1%)	73	85
3	T	93/190 (49%)	90 (97%)	3 (3%)	39	65
3	W	91/190 (48%)	90 (99%)	1 (1%)	73	85
All	All	5126/6300 (81%)	5099 (100%)	27 (0%)	88	94

5 of 27 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	841	ASN
3	L	106	GLU
3	T	93	TYR
3	L	93	TYR
2	M	114	GLN

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

Mol	Chain	Res	Type
1	B	519	ASN
1	D	190	HIS
2	H	42	GLN

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 monosaccharides 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

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	953/990 (96%)	-0.28	0 100 100	55, 72, 89, 121	0
1	B	952/990 (96%)	-0.18	3 (0%) 94 91	56, 76, 92, 128	0
1	C	953/990 (96%)	-0.28	1 (0%) 95 95	55, 72, 90, 117	0
1	D	953/990 (96%)	-0.20	2 (0%) 95 94	54, 77, 93, 121	0
1	E	953/990 (96%)	-0.25	1 (0%) 95 95	51, 73, 90, 120	0
2	H	119/229 (51%)	0.02	1 (0%) 86 81	64, 78, 98, 106	0
2	M	117/229 (51%)	0.24	2 (1%) 70 62	73, 92, 106, 125	0
2	P	118/229 (51%)	0.14	1 (0%) 86 81	71, 88, 105, 112	0
2	S	117/229 (51%)	0.17	1 (0%) 84 79	71, 89, 105, 116	0
2	V	117/229 (51%)	0.03	1 (0%) 84 79	70, 89, 110, 119	0
3	L	108/215 (50%)	0.08	1 (0%) 84 79	64, 77, 96, 113	0
3	N	109/215 (50%)	0.28	1 (0%) 84 79	71, 89, 103, 109	0
3	Q	108/215 (50%)	0.15	0 100 100	63, 81, 96, 100	0
3	T	107/215 (49%)	0.25	1 (0%) 84 79	64, 82, 95, 104	0
3	W	105/215 (48%)	0.20	1 (0%) 82 76	70, 85, 99, 108	0
All	All	5889/7170 (82%)	-0.16	17 (0%) 94 91	51, 76, 96, 128	0

The worst 5 of 17 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	M	14	LEU	3.5
2	M	20	SER	2.8
1	C	493	GLU	2.8
1	E	43	ASN	2.6
2	S	14	LEU	2.6

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 monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.