

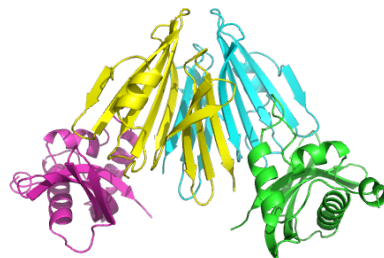
CASP 13 Assembly assisted

Riviera Maya, Dec 2018

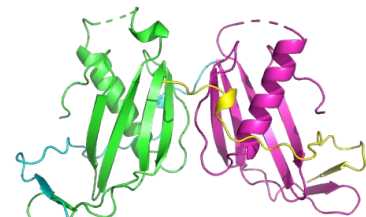
Jose Duarte, Dmytro Guzenko
RCSB Protein Data Bank, UC San Diego

Data-assisted predictions

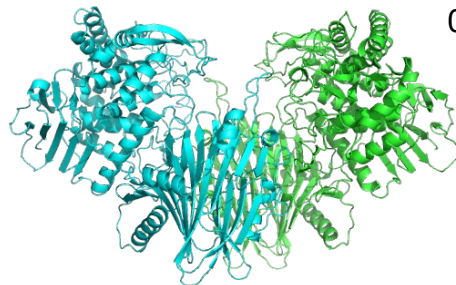
- SAXS/SANS: 7 targets
- X-links: 7 targets
- NMR: 1 target



0968 (A2B2): SAXS, X-links, x-links



0980 (A2B2): NMR, SAXS



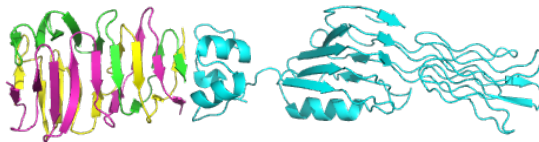
0985 (A2): SAXS (A1 in regular predictions)

CASP:
Image redacted

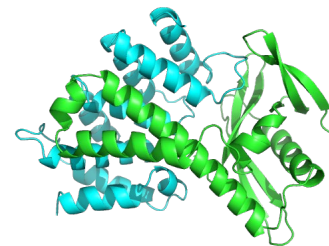
0981 (A3): SAXS, X-links

CASP:
Image redacted

0999 (A2): SAXS, X-links



0953 (A3B1): SAXS, SANS, X-links

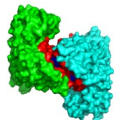


0957 (A1B1): SAXS, X-links, x-links

Scores used in assisted assembly assessment

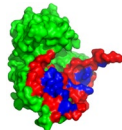
4 scores used for assembly assessment:

Interface Contact Score (F1)

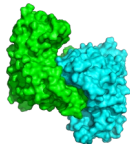


Interface/local

Interface Patch Score (Jaccard)



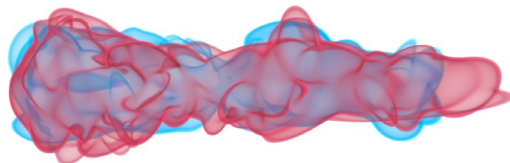
Oligomeric IDDT



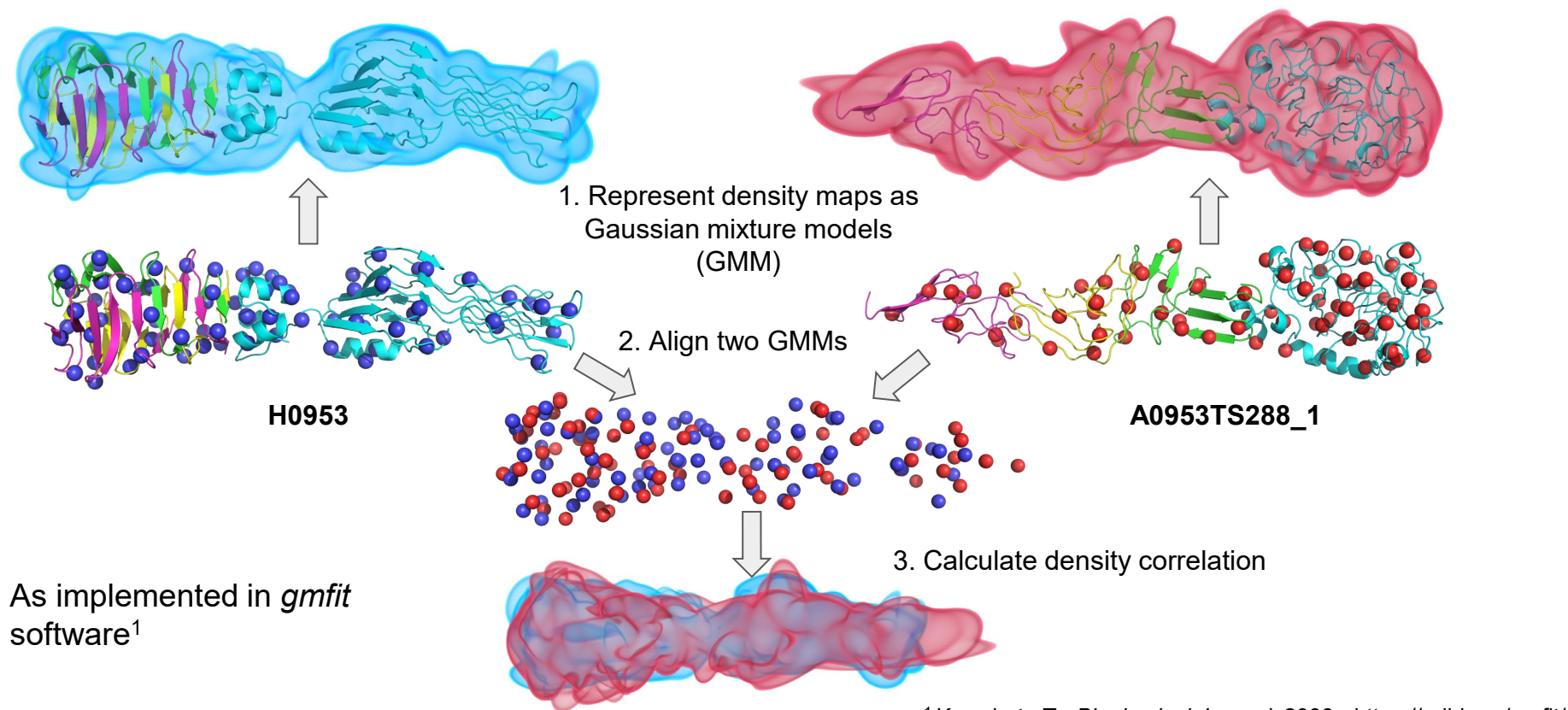
Assembly/global

Oligomeric TM-Score

An extra score not used for the main assembly category: **density correlation**



Density correlation score: methodology

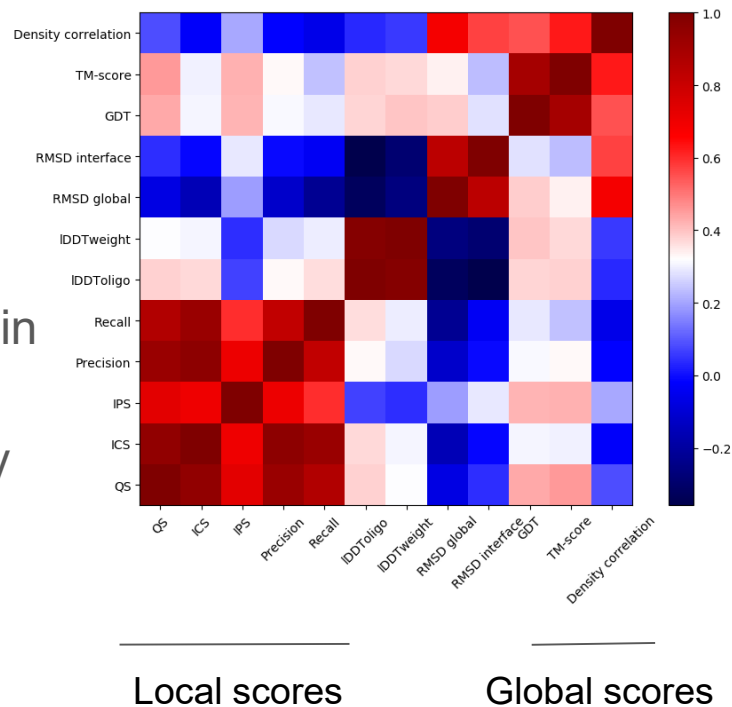


¹ Kawabata T., *Biophysical Journal*, 2008 - <https://pdbj.org/gmfit/>

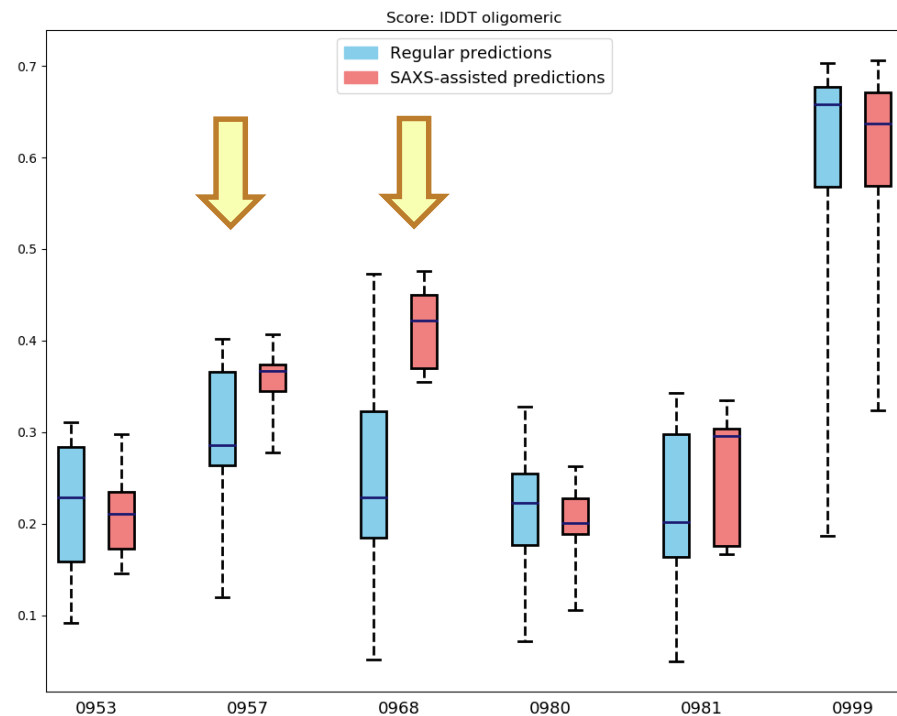
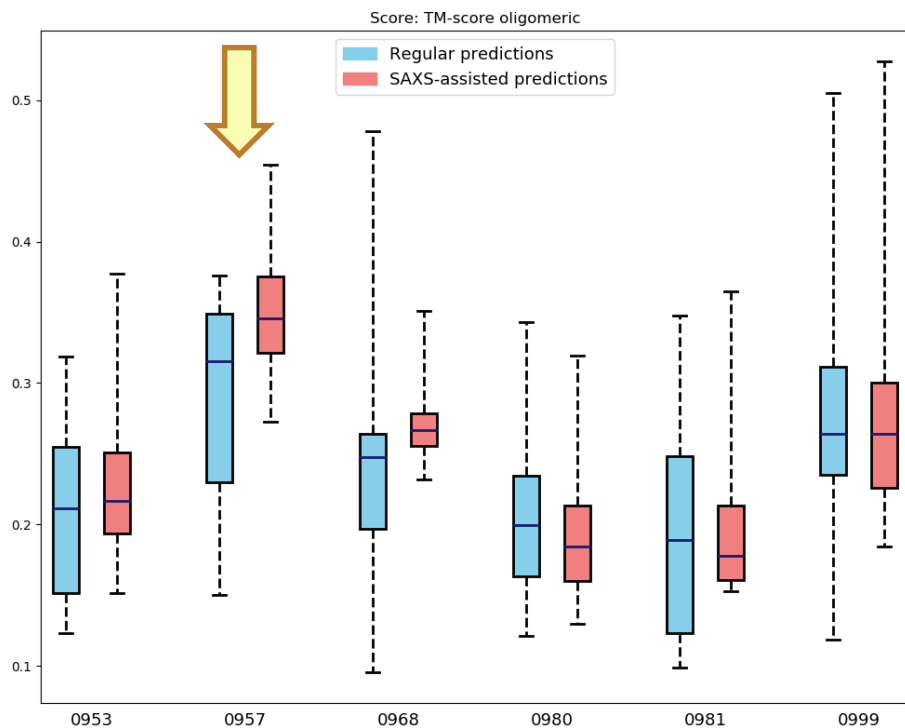
Scores correlation

Density Correlation score:

- Is most similar to our other global scores (IDDT, TM, GDT)
- Still it captures other information not seen in other global scores
- Importantly it does not care about topology

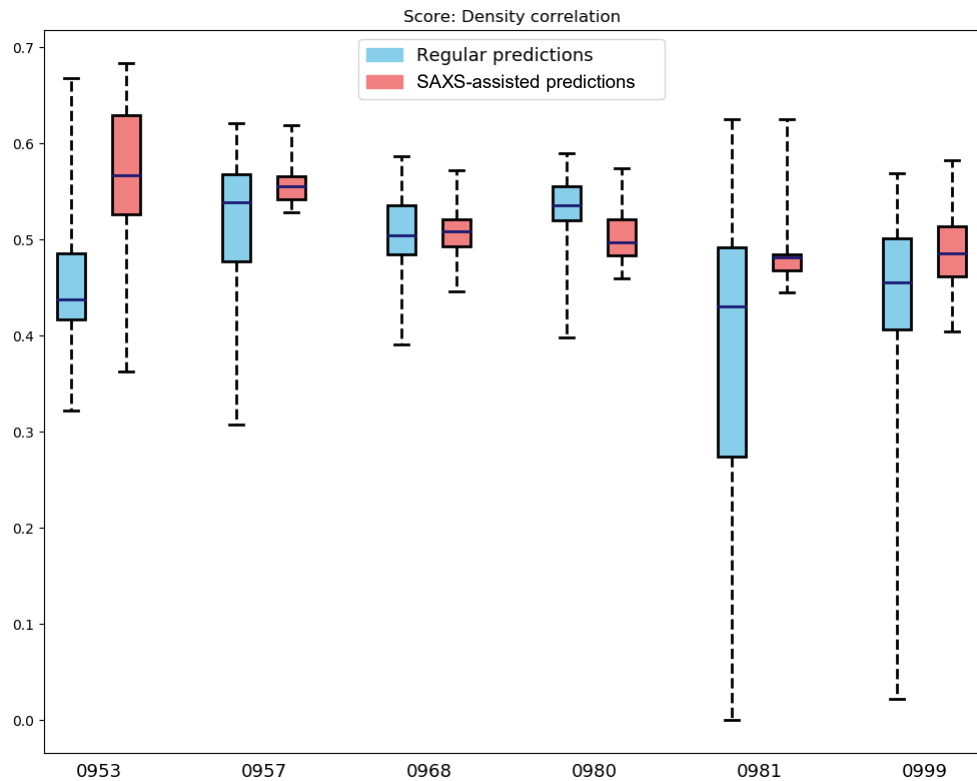


SAXS: global scores



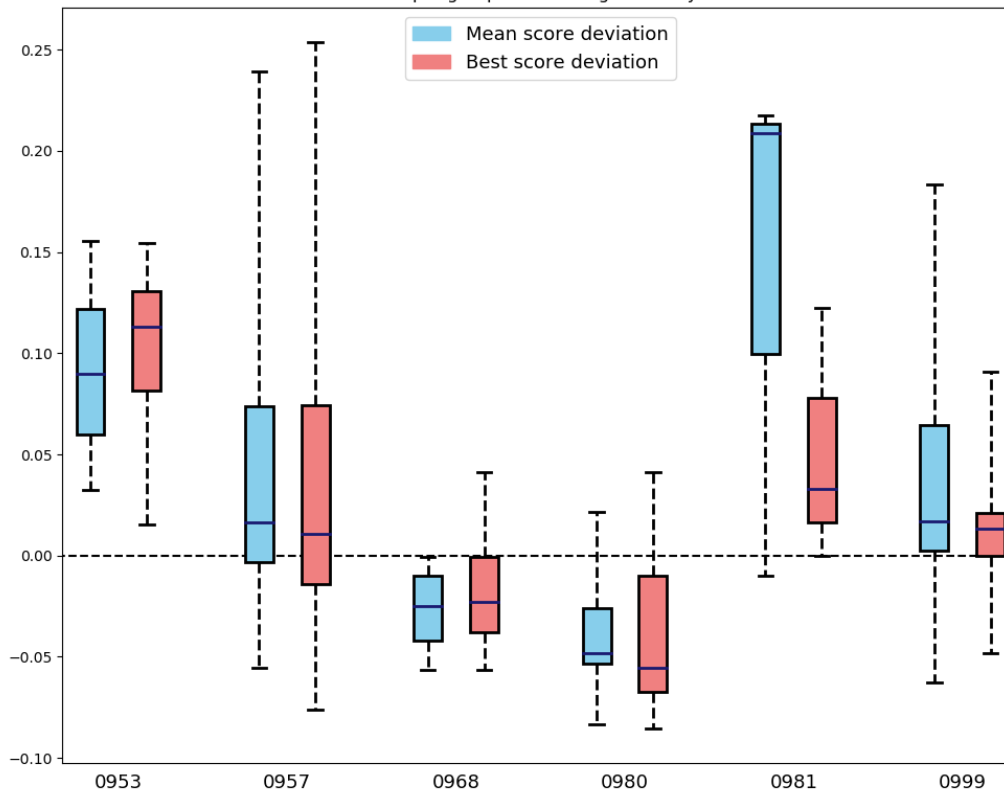
SAXS: density correlation

- Worst cases improved for all targets
- Average prediction improved in 4/6 targets
- Best predictions are about the same

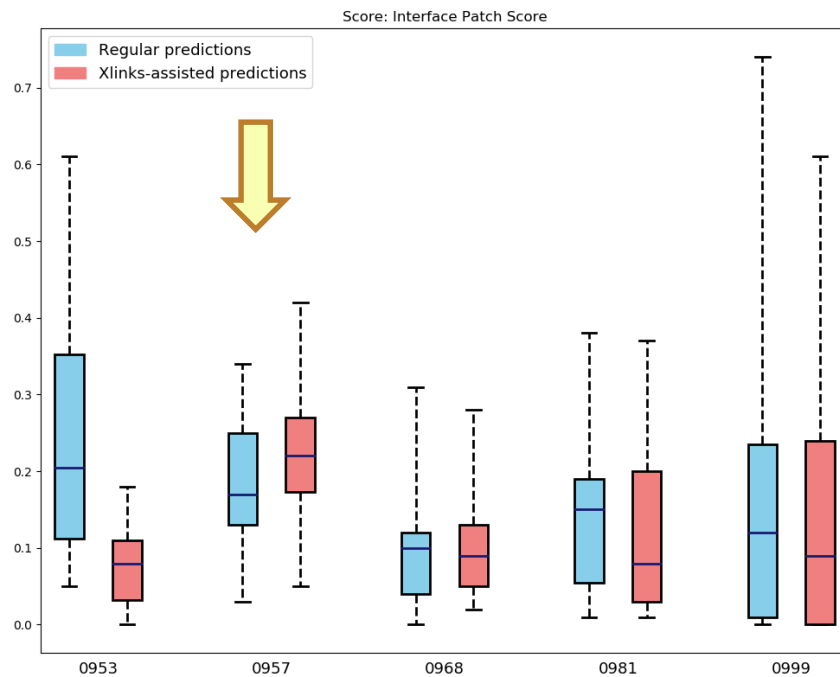
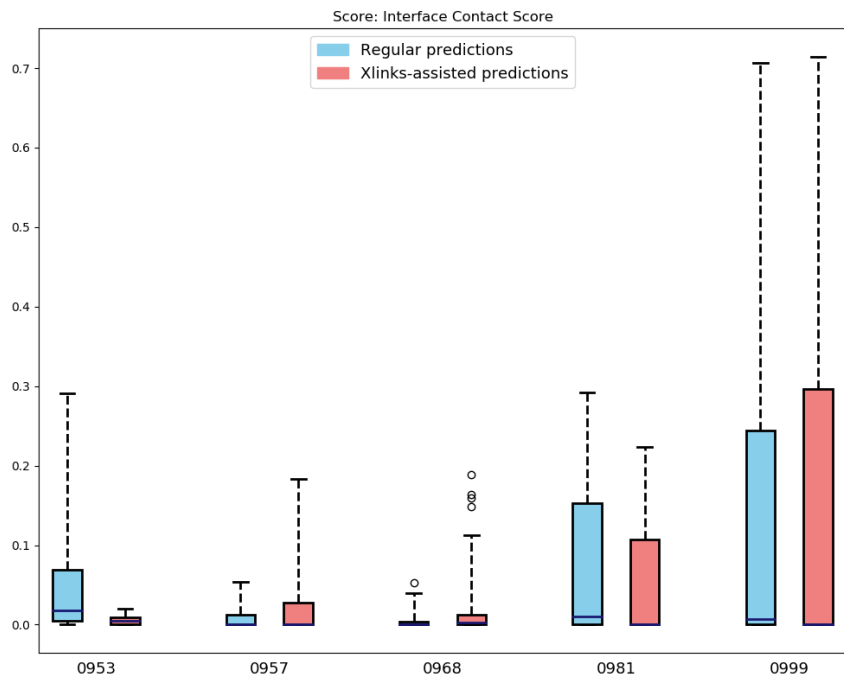


SAXS: deltas within groups

SAXS-assisted per group score change. Density correlation

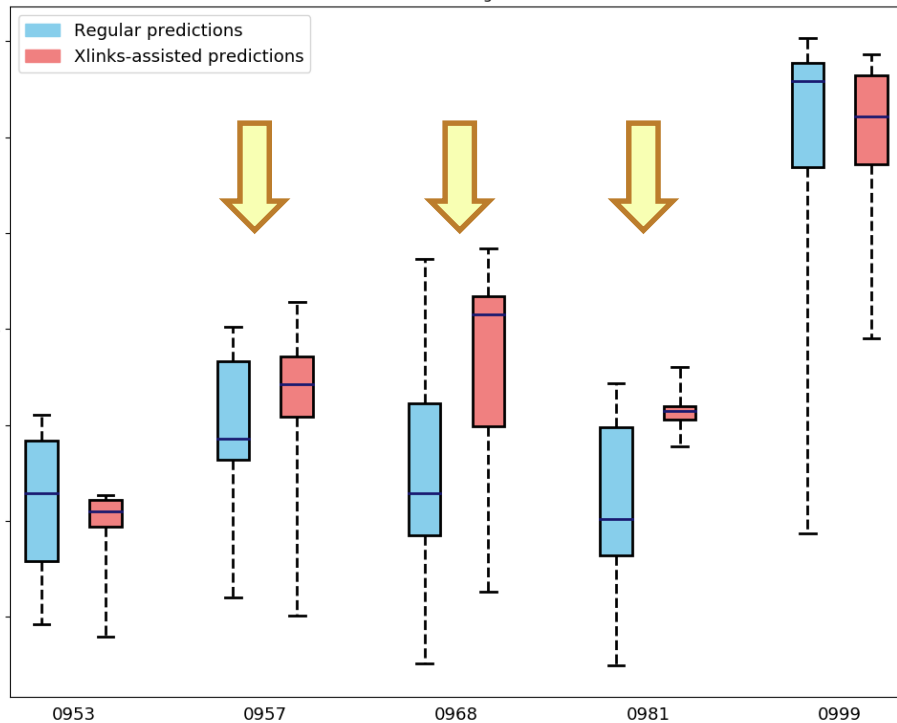


Xlinks: interface scores

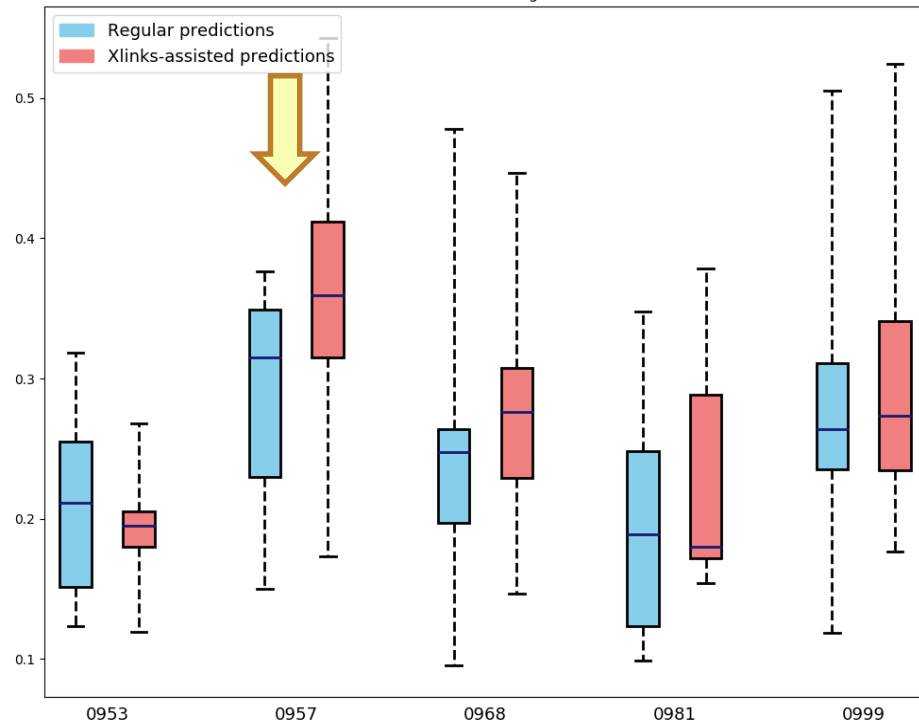


Xlinks: global scores

Score: IDDT oligomeric

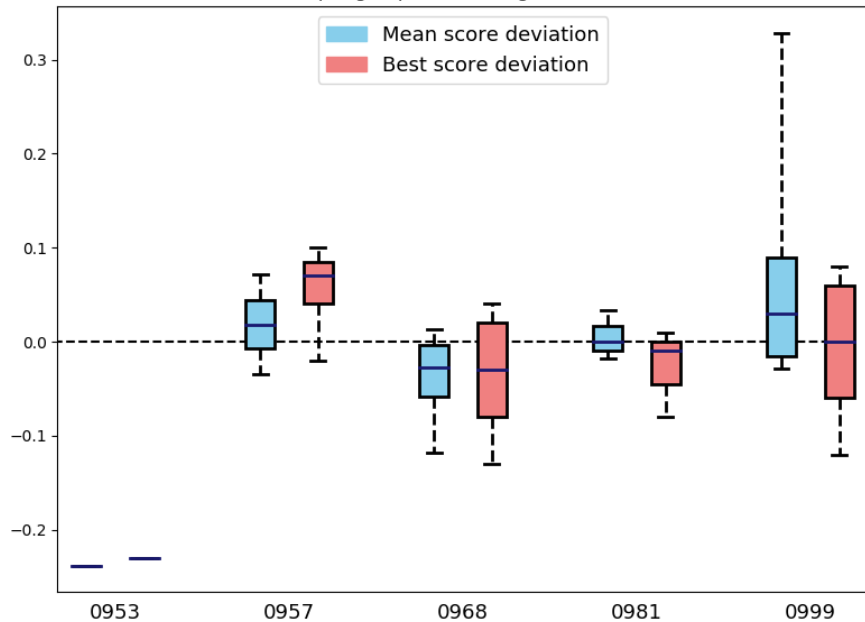


Score: TM-score oligomeric

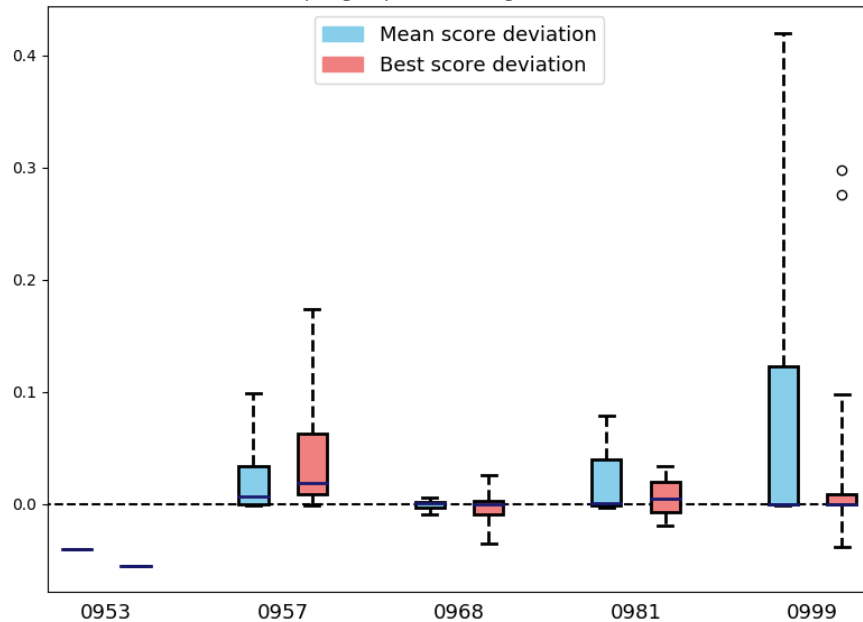


X-links: deltas within groups

Xlinks-assisted per group score change. Interface Patch Score



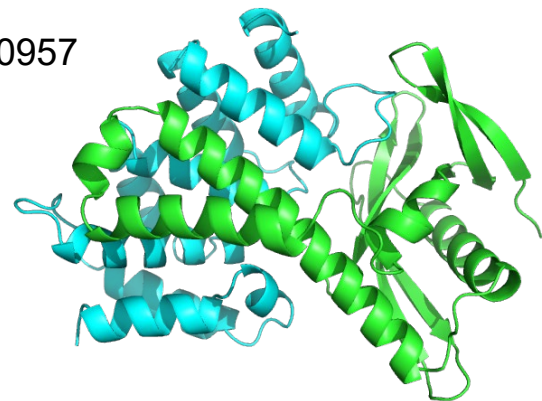
Xlinks-assisted per group score change. Interface Contact Score



Xlinks highlight

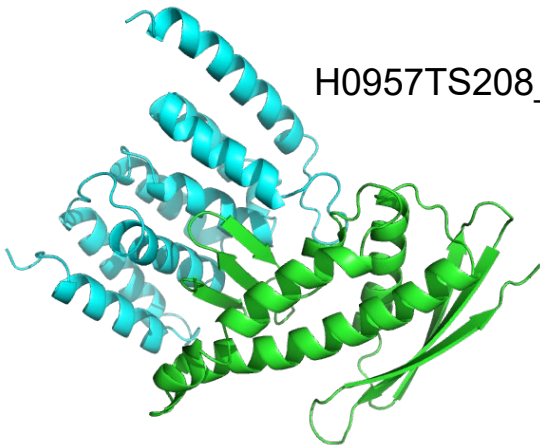
- H0957 appears to be the only target that has benefitted from the crosslinking data, by all metrics.
- In theory, interface contact scores should have been improved across the board

H0957

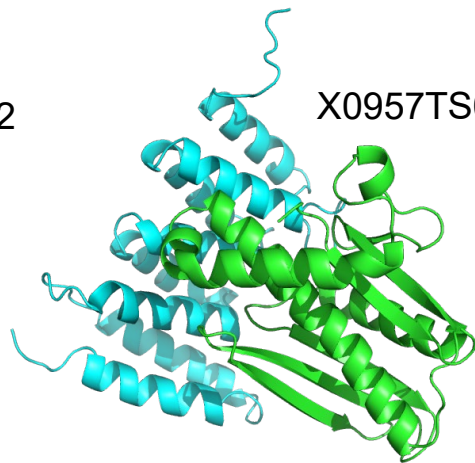


Best (by TM-score) predictions:

H0957TS208_2

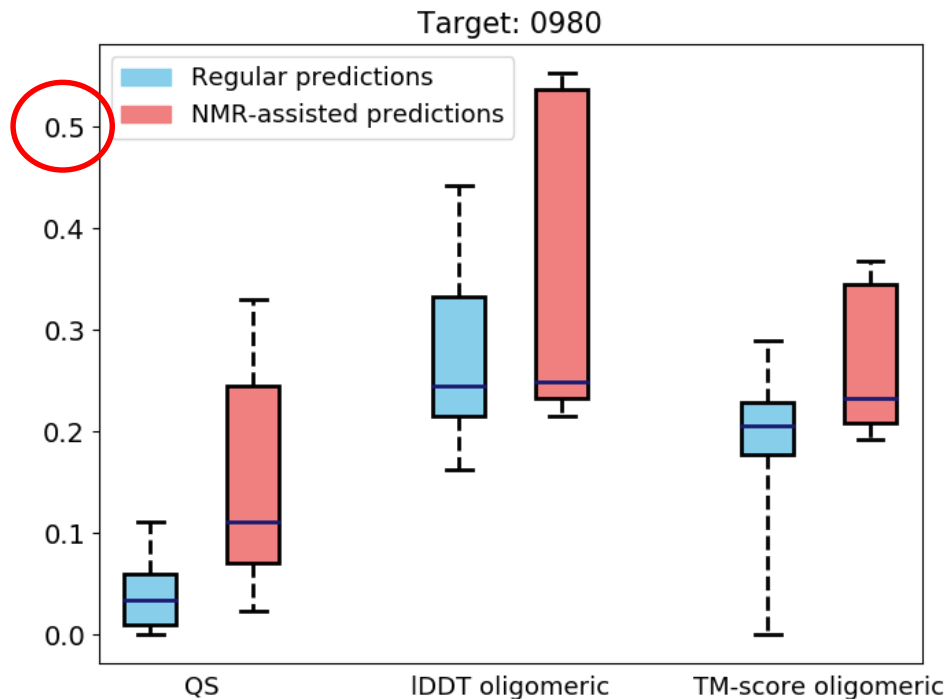


X0957TS000_3



NMR assisted: interface and global scores

- H0980: classified as hard target
- Only 3 groups doing both
- NMR target released as A1B1, assembly target as A2B2. We are comparing to A1B1 for both
- Deltas per group:
 - 288: QS +0.18
 - 208, 492: around 0



Acknowledgements

Dmytro Guzenko (see poster also!)

Andriy Kryshtafovych
Bohdan Monastyrskyy

Gaetano Montelione
Susan Tsutakawa
Greg Hura
Andras Fiser

C
A
S
P
13



RCSB **PDB**
PROTEIN DATA BANK

UC San Diego

Software:
OpenStructure and BioJava developers
Takeshi Kawabata: density manipulation tools