CASP 13 Assembly assisted

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Data-assisted predictions

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

0980 (A2B2): NMR, SAXS
0968 (A2B2): SAXS, X-links, x-links
0981 (A3): SAXS, X-links
0985 (A2): SAXS (A1 in regular predictions)
0999 (A2): SAXS, X-links
0953 (A3B1): SAXS, SANS, X-links
0957 (A1B1): SAXS, X-links, x-links

CASP: Image redacted
Scores used in assisted assembly assessment

4 scores used for assembly assessment:

- Interface Contact Score (F1)
- Interface Patch Score (Jaccard)
- Oligomeric IDDT
- Oligomeric TM-Score

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

1. Represent density maps as Gaussian mixture models (GMM)
2. Align two GMMs
3. Calculate density correlation

As implemented in gmfit software

H0953

A0953TS288_1

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

Blue: mean score delta
Red: best score delta
Xlinks: interface scores
Xlinks: global scores

Score: IDDT oligomeric

Score: TM-score oligomeric

Regular predictions
Xlinks-assisted predictions

0953 0957 0968 0981 0999

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0.1 0.2 0.3 0.4 0.5 0.6 0.7
X-links: deltas within groups
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.
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
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