

# 30 years of attempts of manual predictions in CASP.

A truely failed story

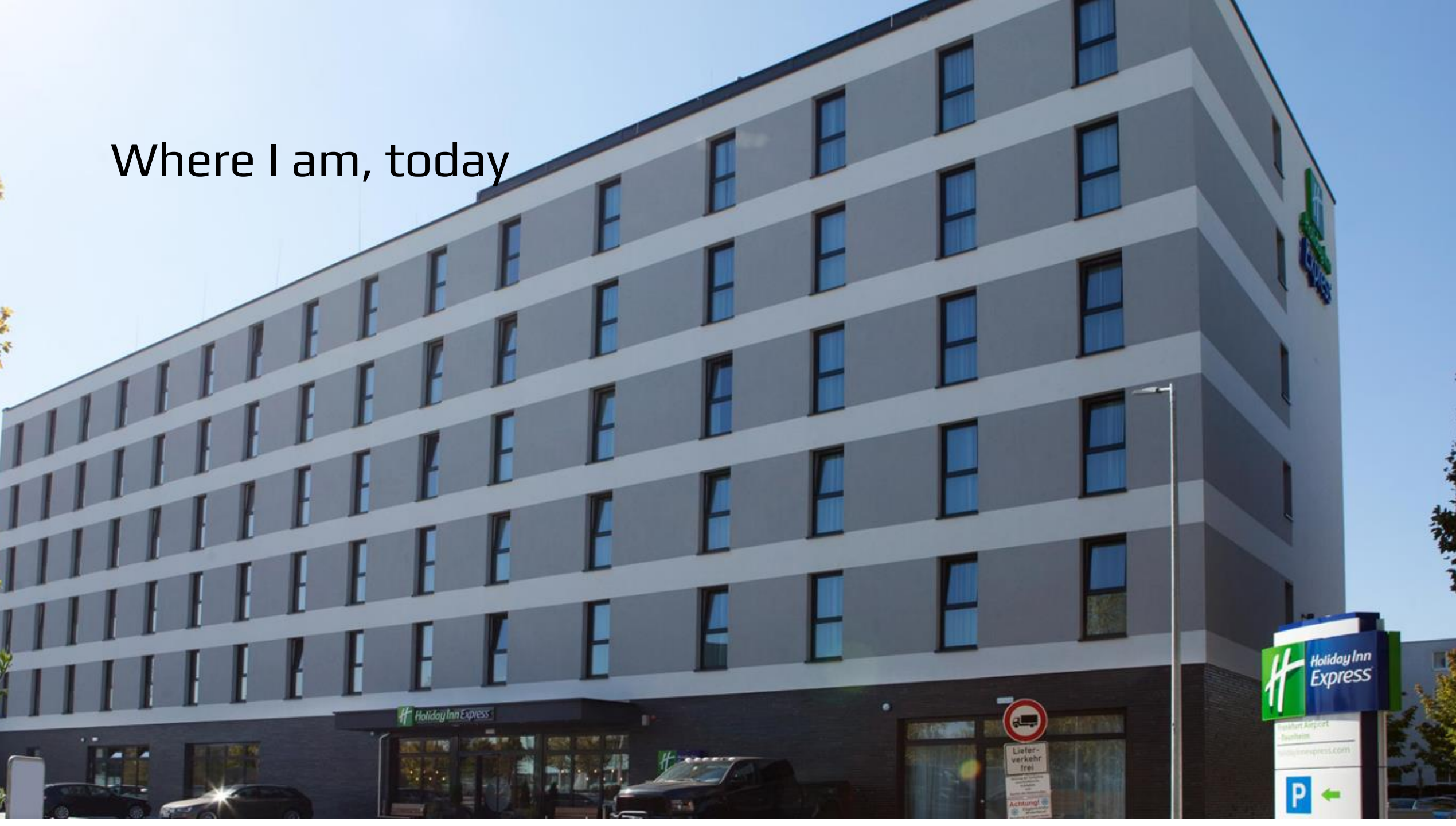
by

Arne Elofsson

What I saw yesterday



Where I am, today

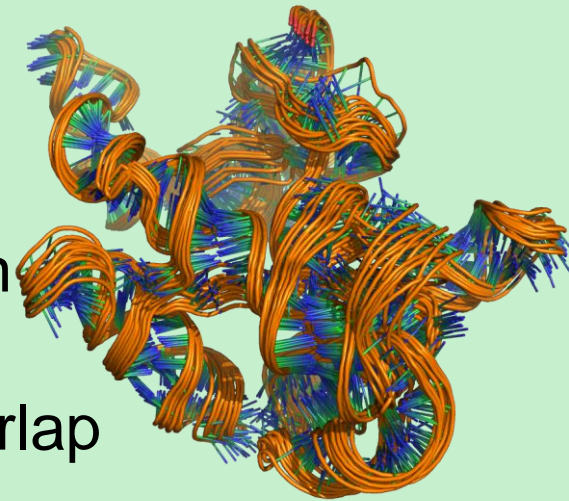
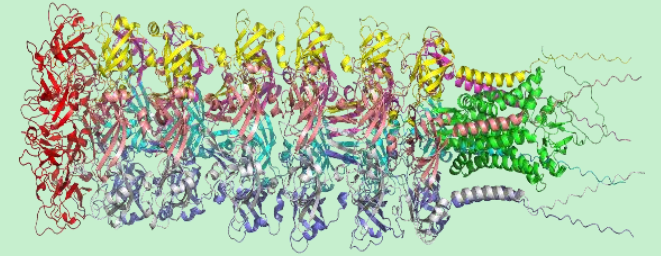




A vibrant tropical beach scene. In the foreground, several palm trees with green and yellow fronds lean over a white sandy beach. The water is a clear, bright turquoise, transitioning to a deeper blue further out. The sky is a solid, clear blue with a few small white clouds on the right side. The overall atmosphere is peaceful and idyllic.

Where I should be (and you are)

- Generated 13230 models (~25 jobs/day) generated
  - Three Google accounts allowed 60 per day.
  - T1200/T1300 500 models
  - R1254 380 models
  - Most targets 50 models
- General “pipeline”
  - AF3: ~5 minutes to upload models
  - Submit the five models
  - Too big models:
    - Divide it into parts and “merge” using MolPC superposition
  - RNA models:
    - If overlapping - rerun and select the ones that do not overlap
  - Ligands
    - Identify most similar ligand - run server with that superpose the correct ligand and replace it.



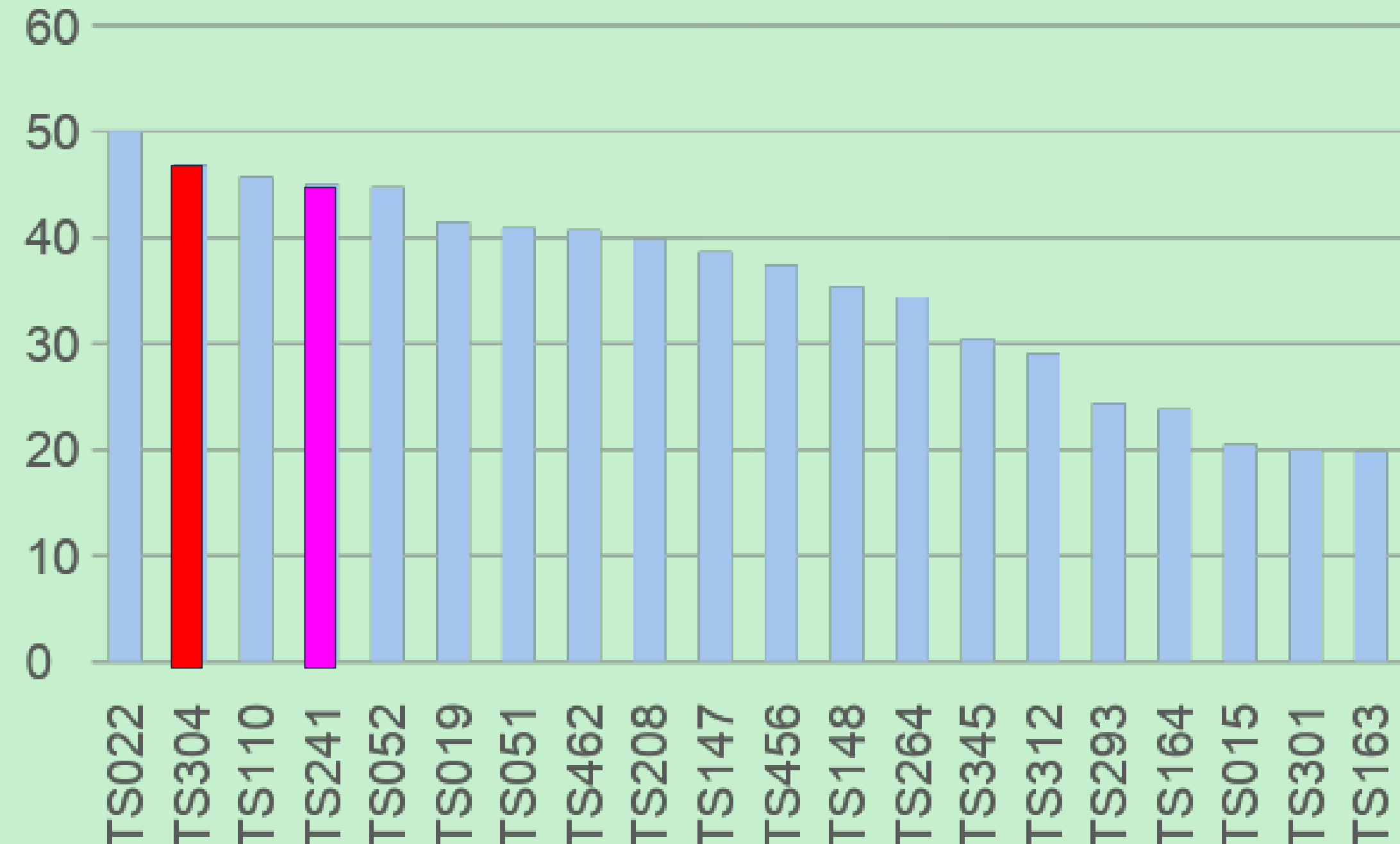
- Spend most time on Stage 0 models running alternative stoichiometries
  - AF3 select only by pTM.
  - Elofsson pick also on good looks
- Stage 1: rerun 10 AF3 predictions with the right stoichiometry
  - Select the “top 1” predictions with highest AF3-scores
- Big/Difficult/Mxxx models:
  - Remove disordered regions
  - Cut into fragments
  - Cluster sometimes
  - Manual selection
- Stage 2: copy from Stage 1.



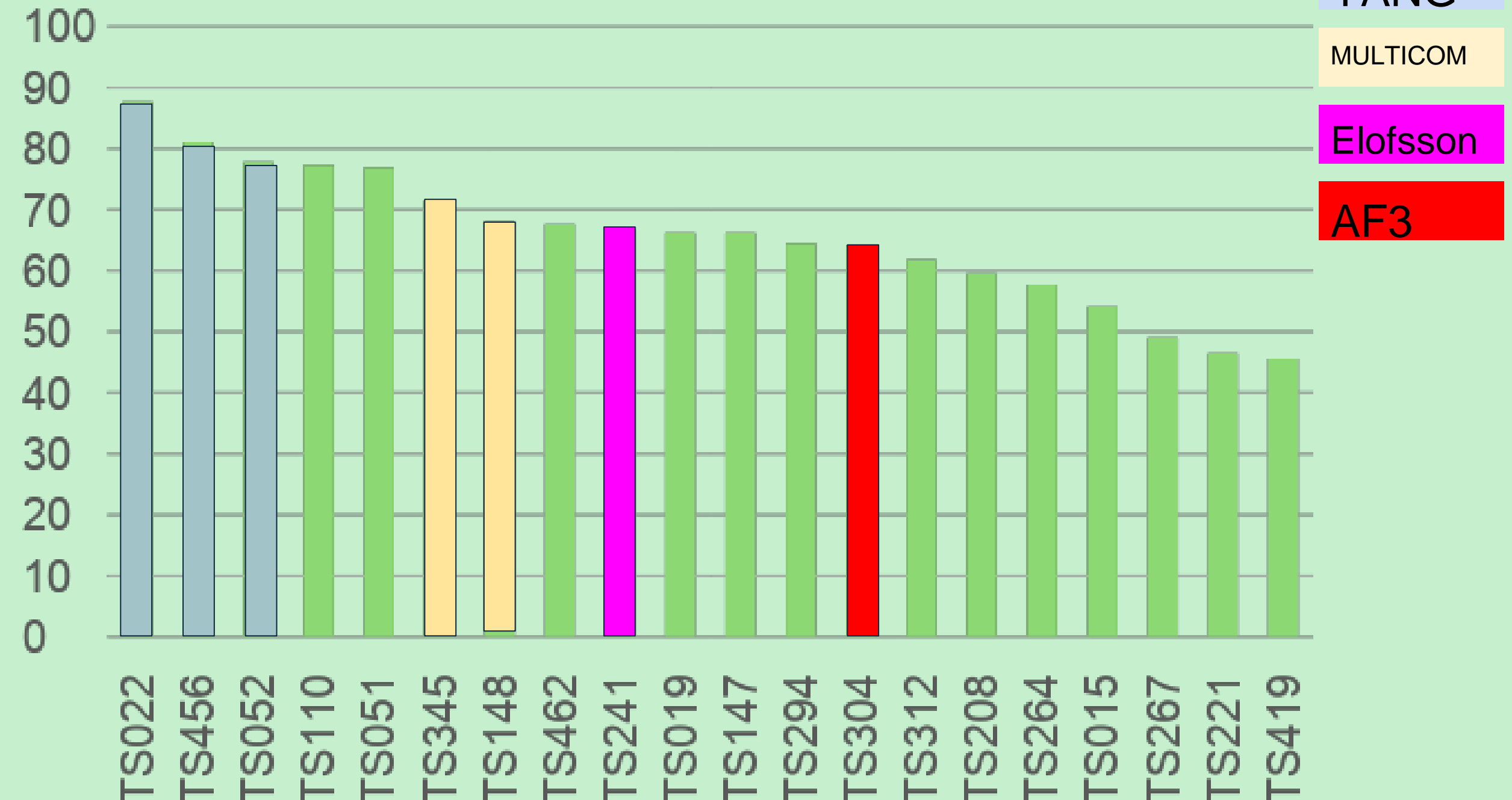
# First models

Elofsson

AF3



# Best models

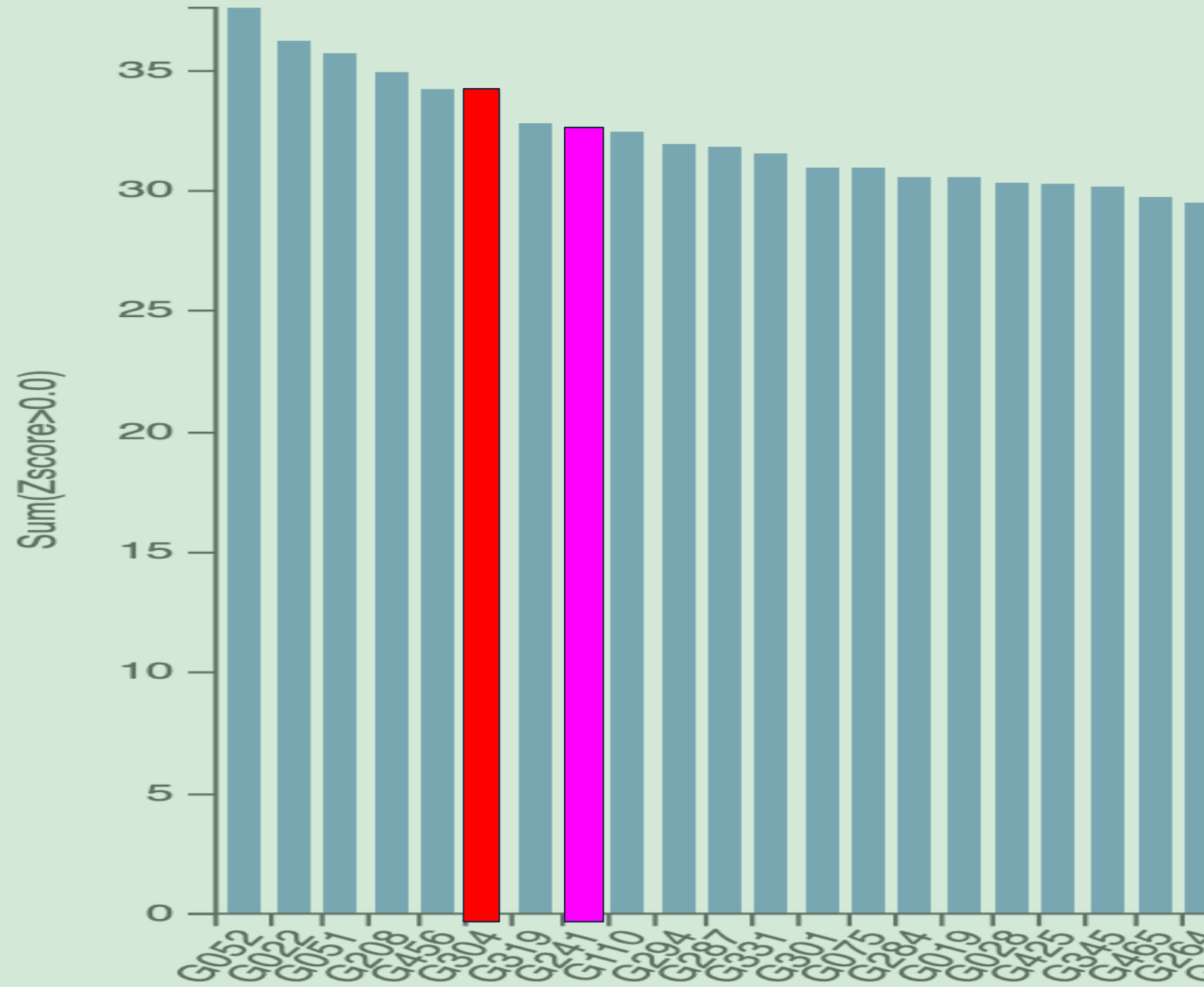




# Domains (Zscore>0)

Elofsson

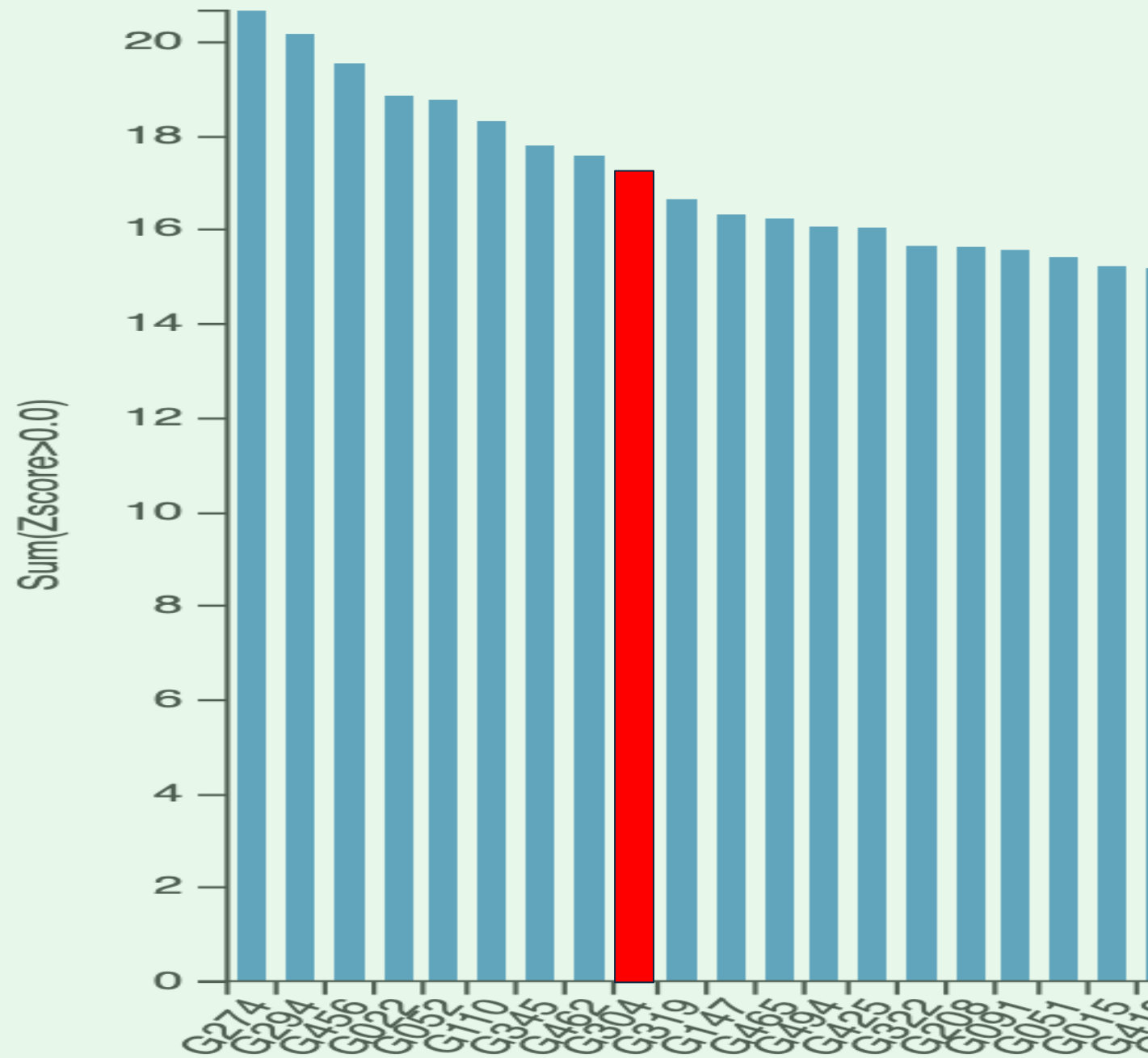
AF3



# Multimers Z-score>0

Elofsson

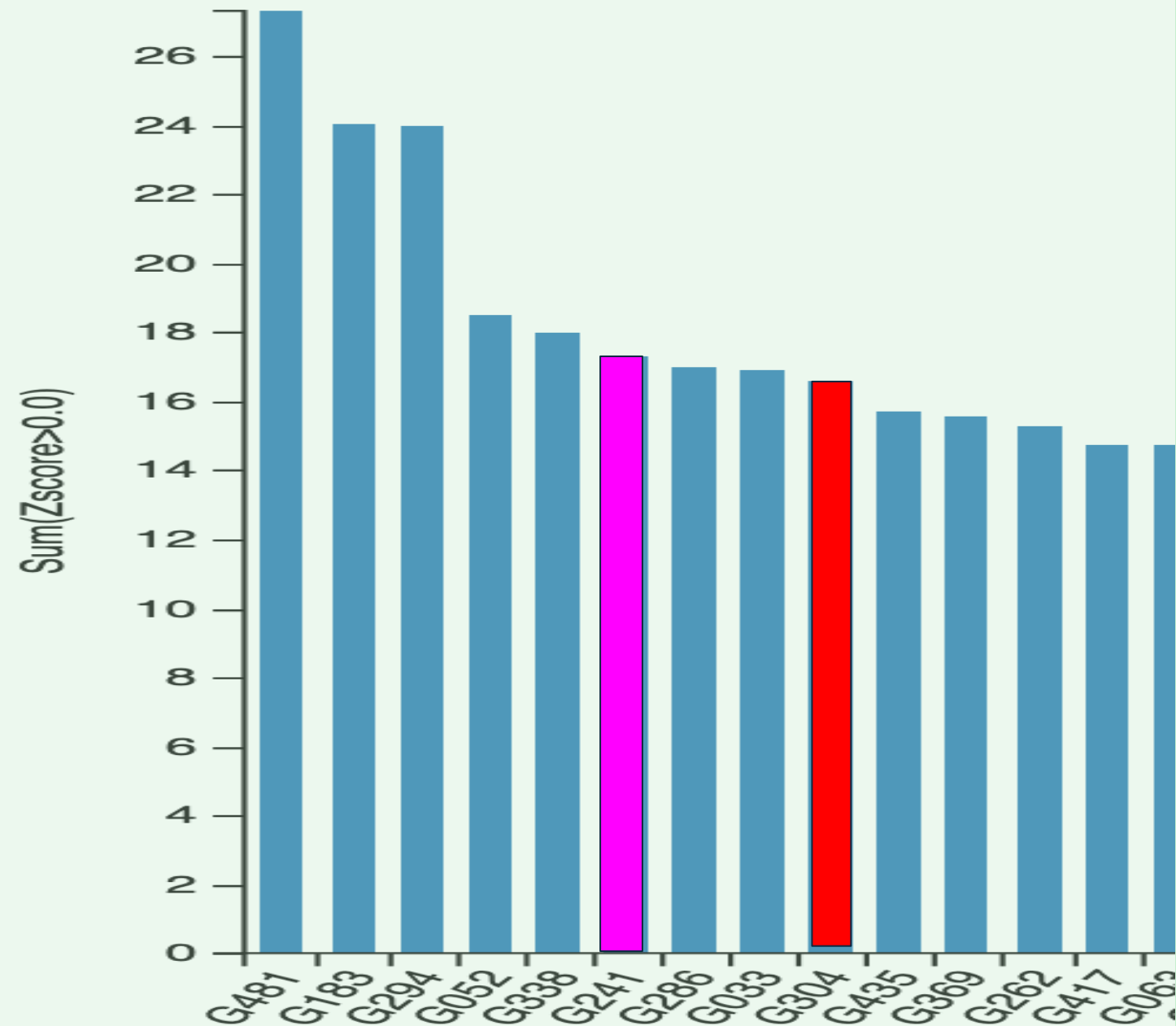
AF3



# RNA/DNA MONOMER

Elofsson

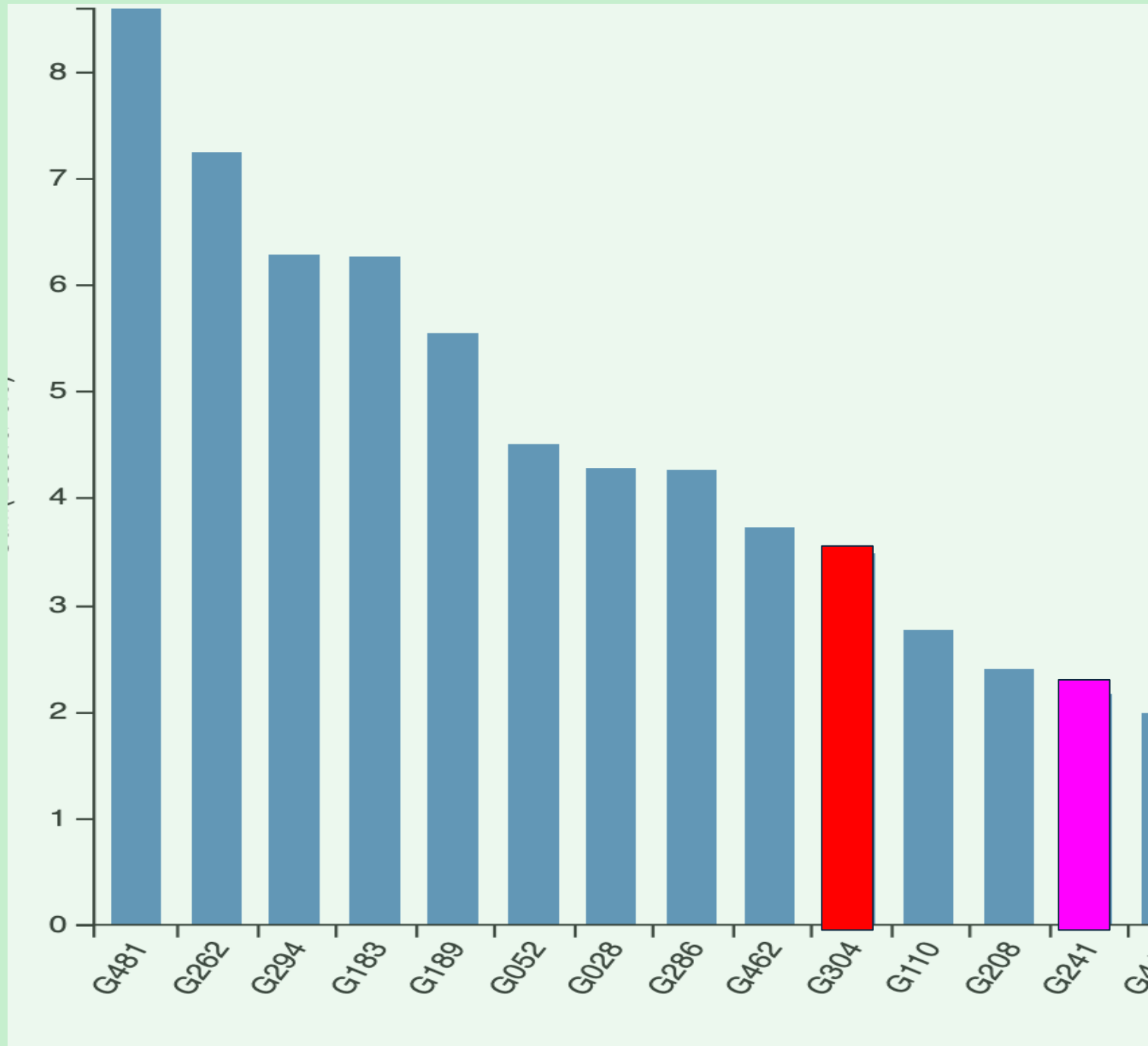
AF3



# RNA/DNA MULTIMER

Elofsson

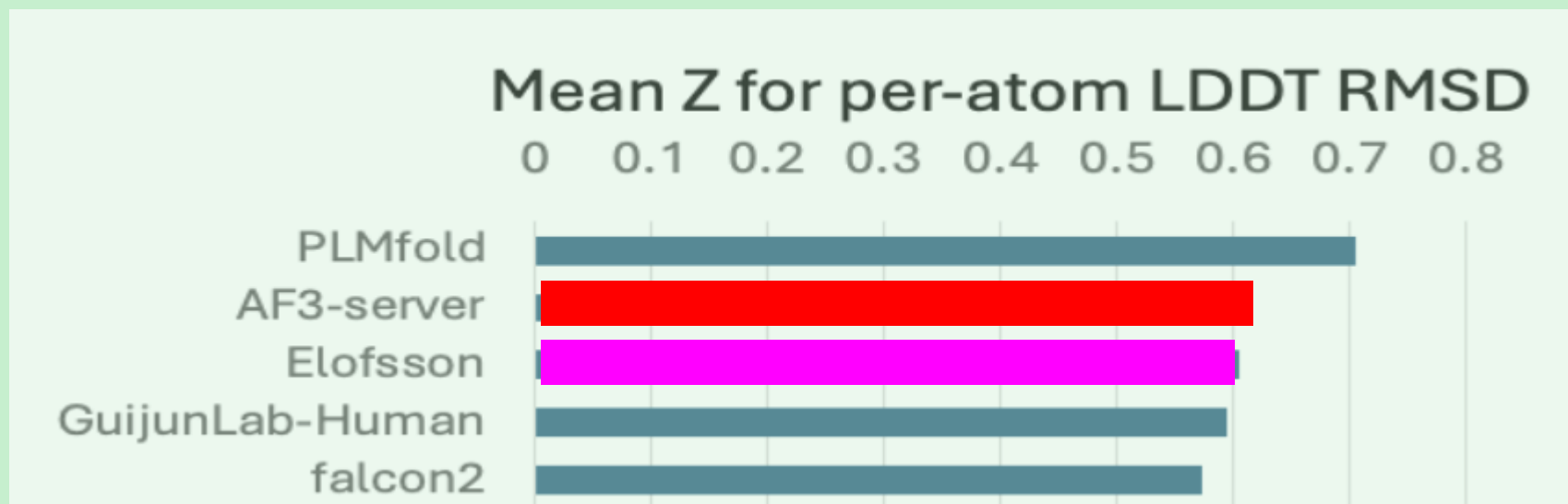
AF3



# EMA

Elofsson

AF3

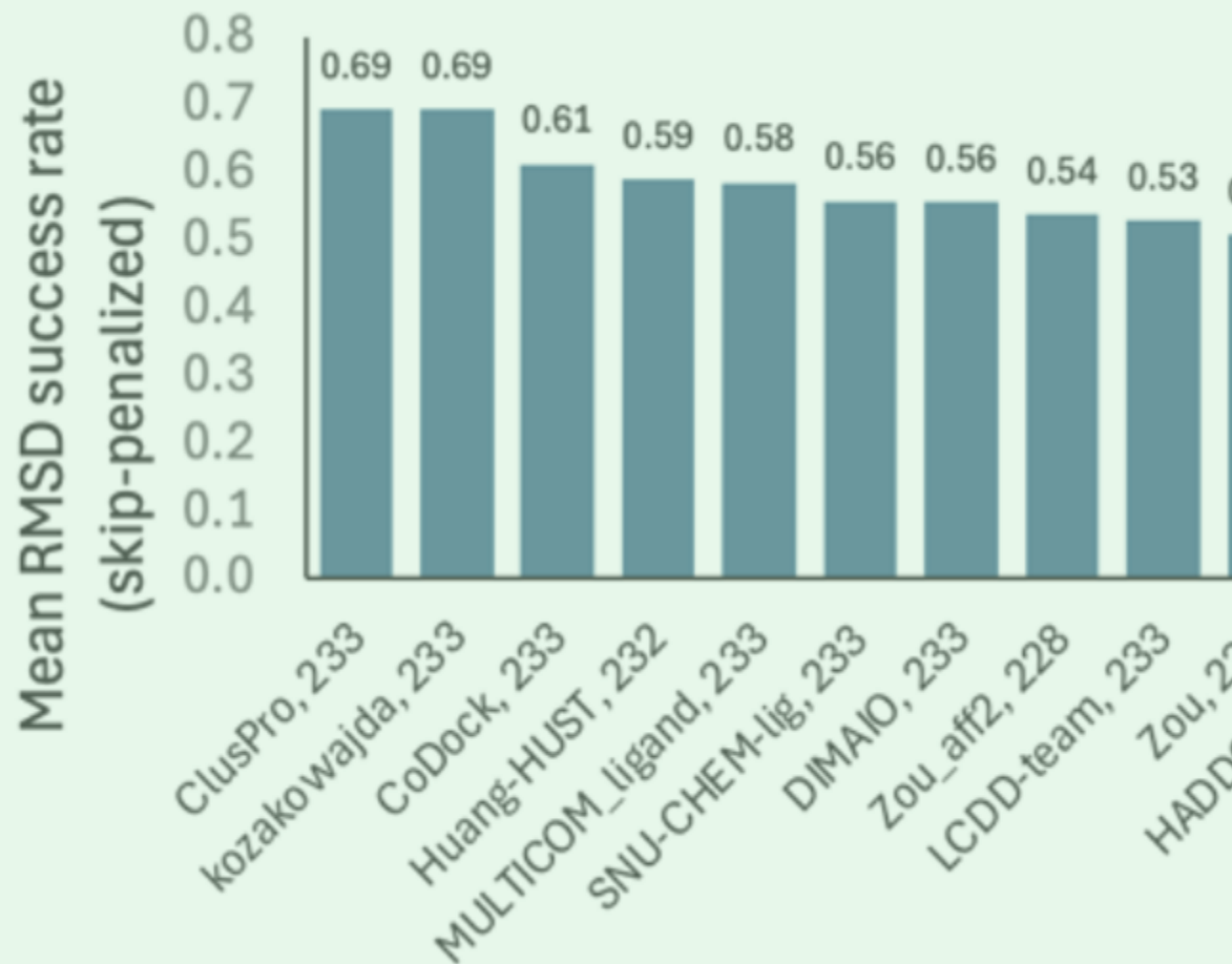




# Ligands

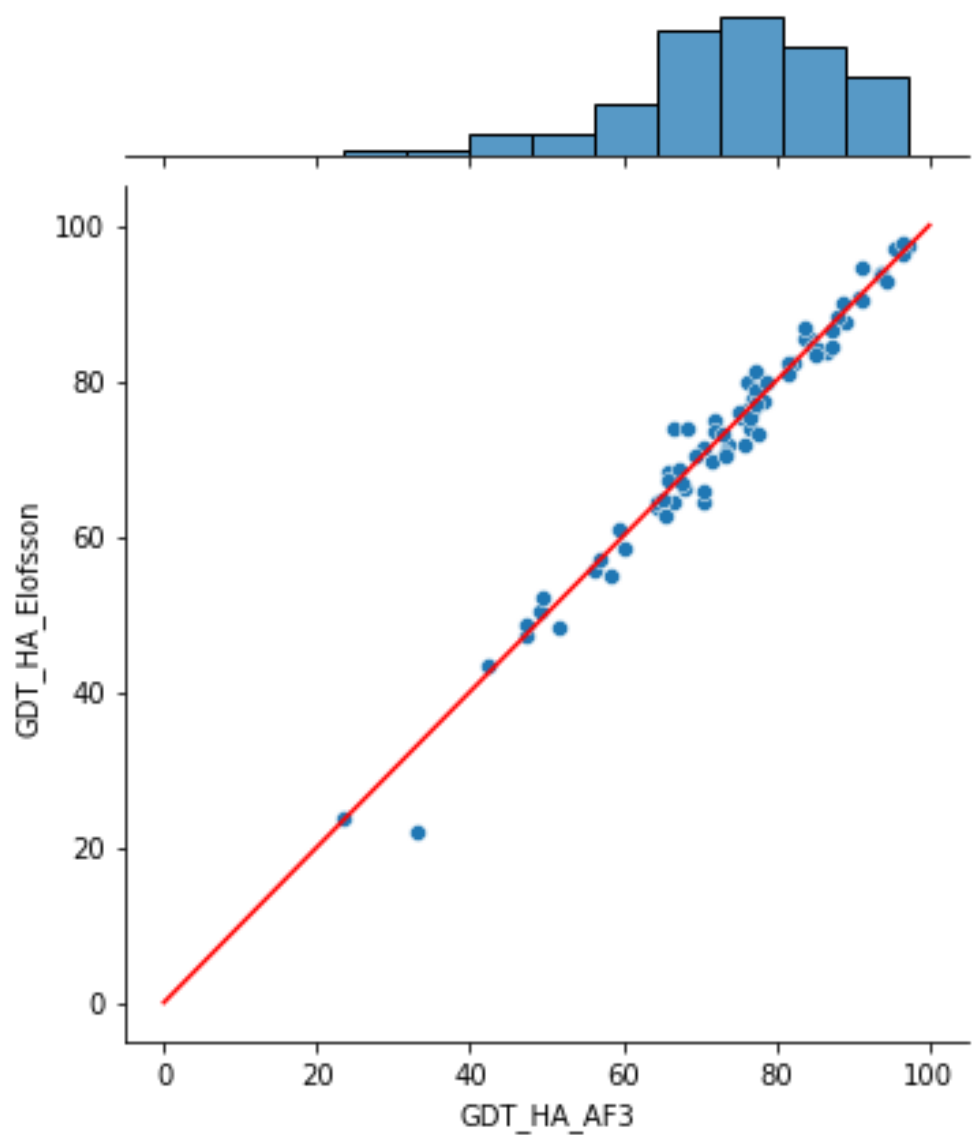
Elofsson

AF3

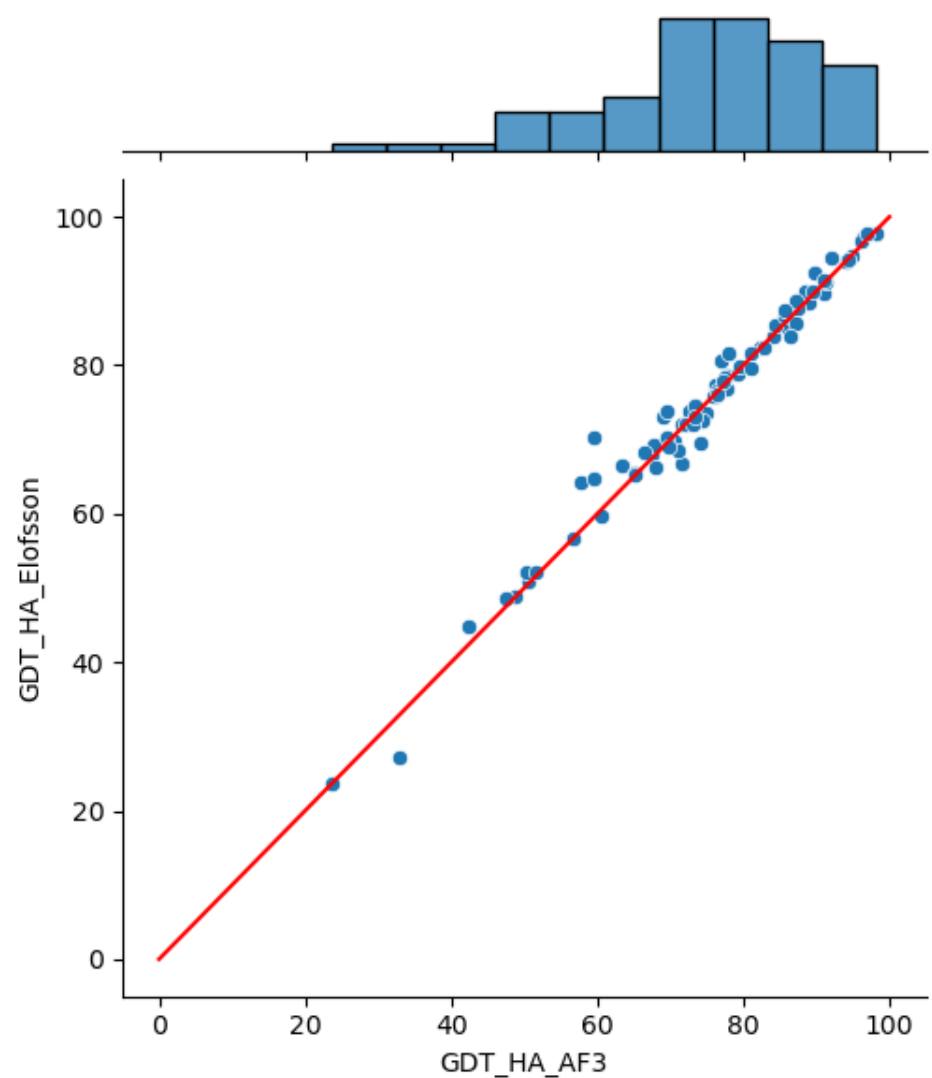


- I did not read the instructions correctly so submitted them as PDB files - not evaluated
  - I have a script now to fix it for next year.

# Elofsson - vs AF3 (GDT\_HA)

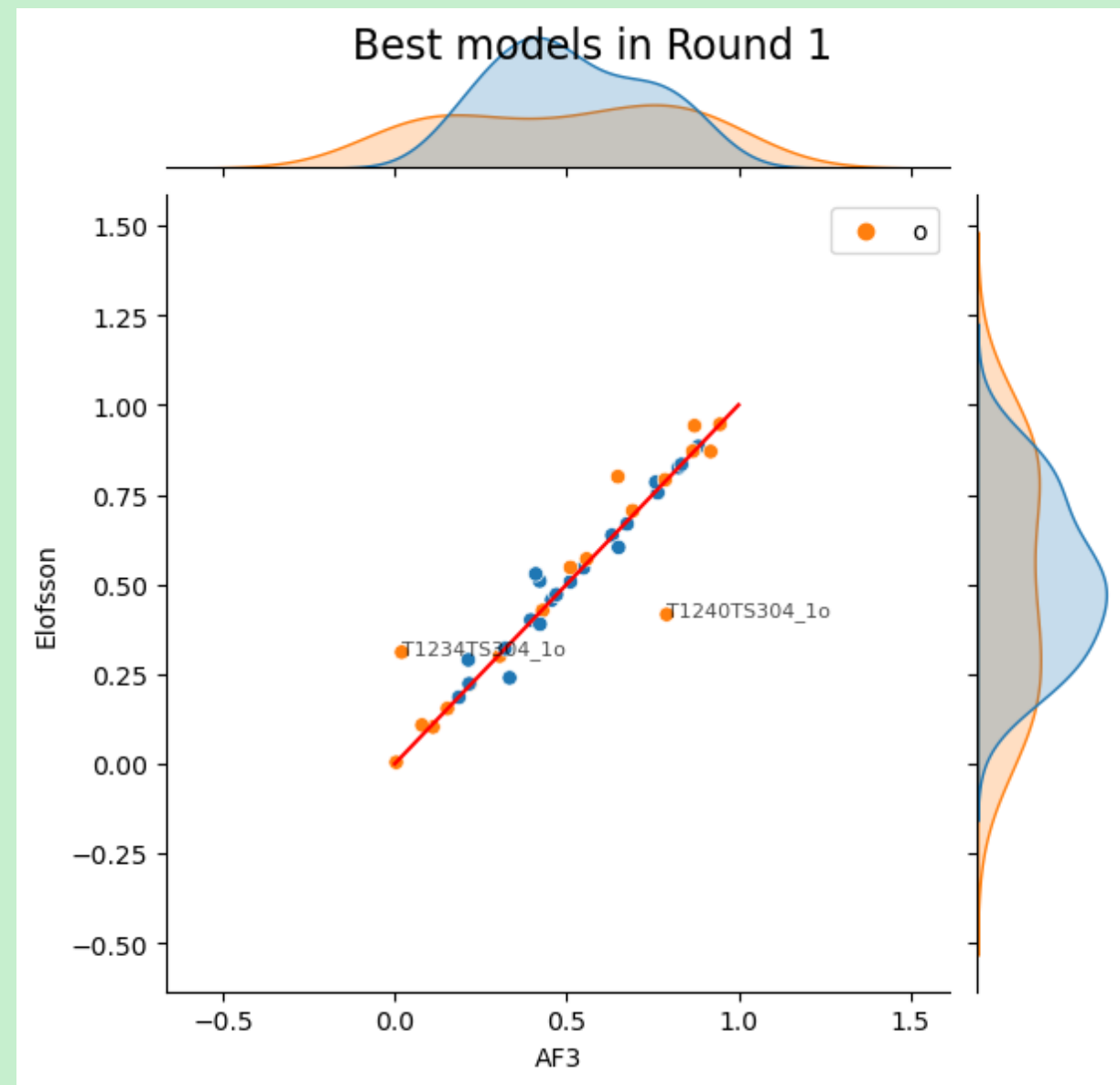
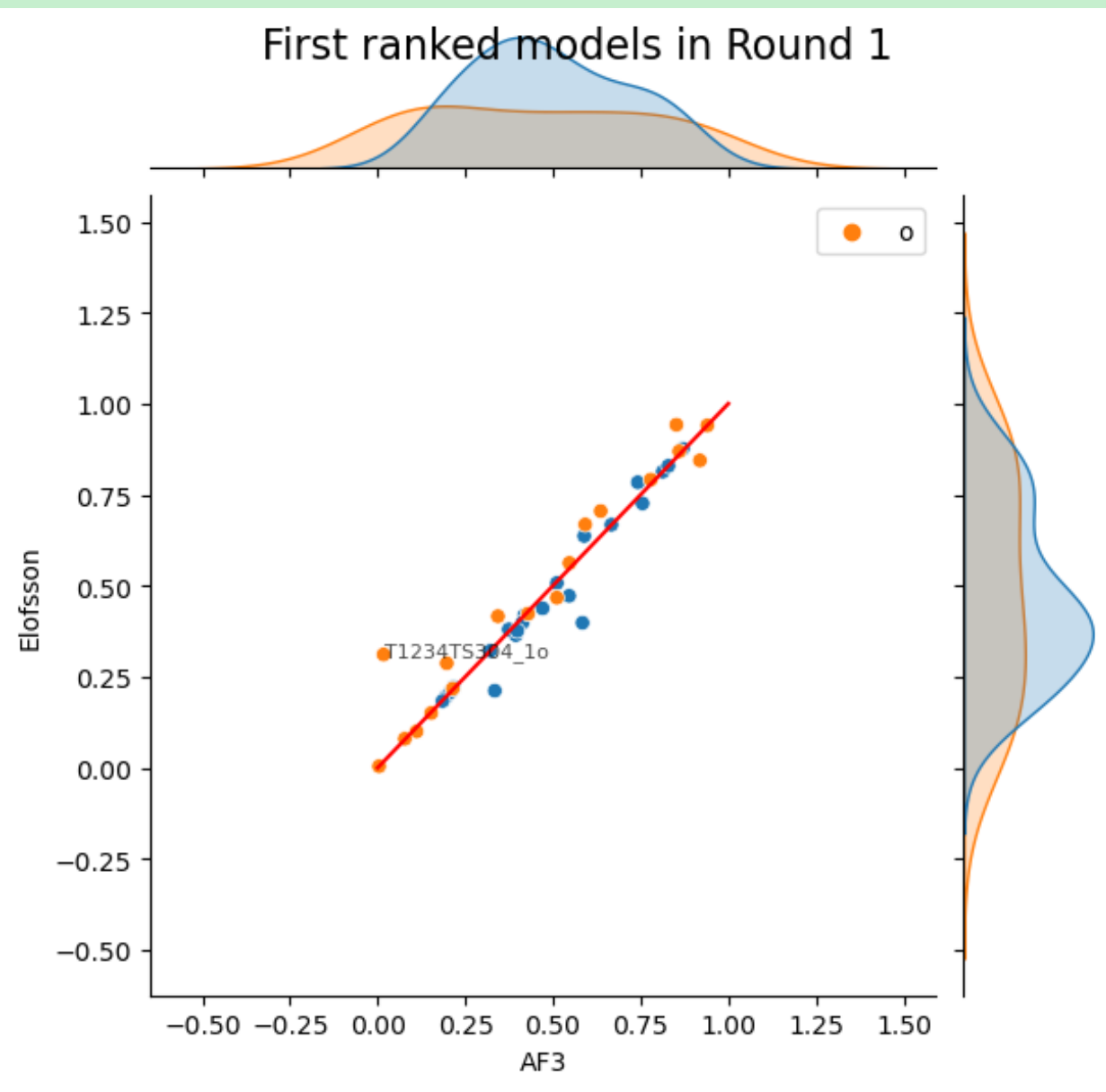


First

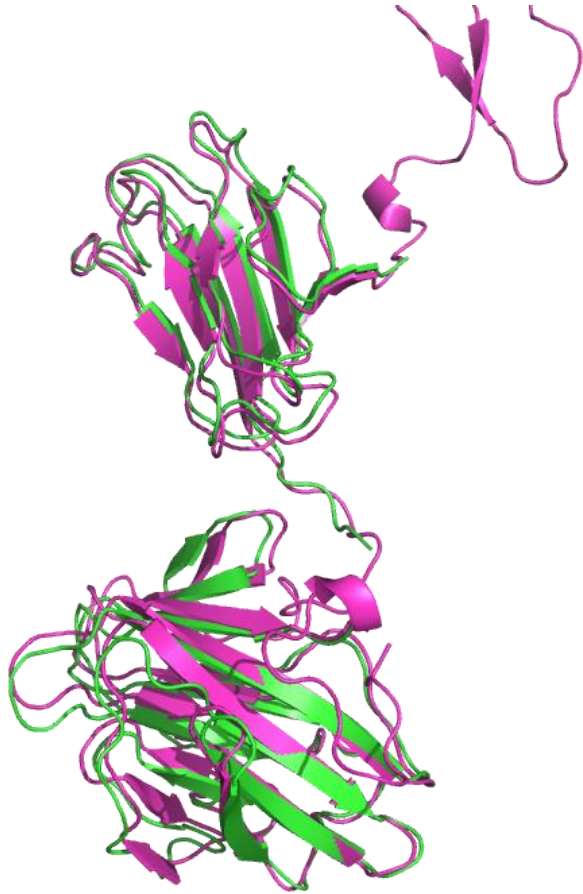


Best

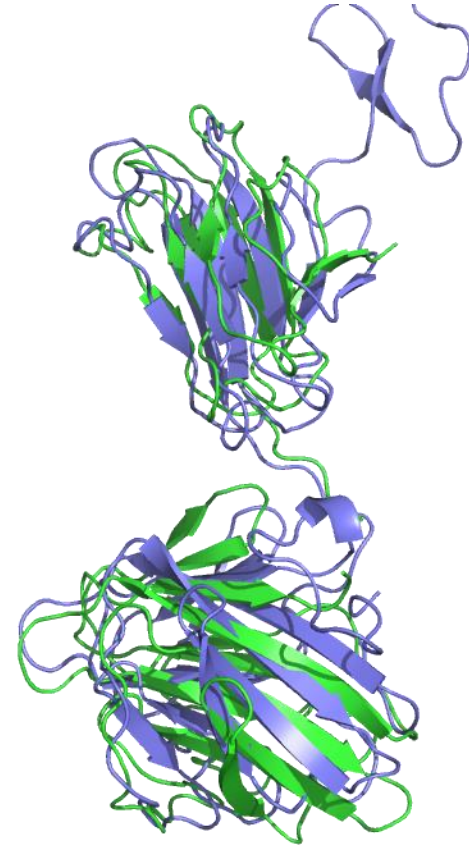
# Elofsson vs AF3 (DockQ)



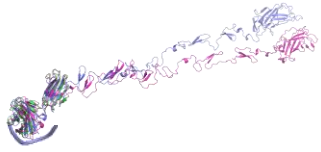
# T1240 (the structural domain)



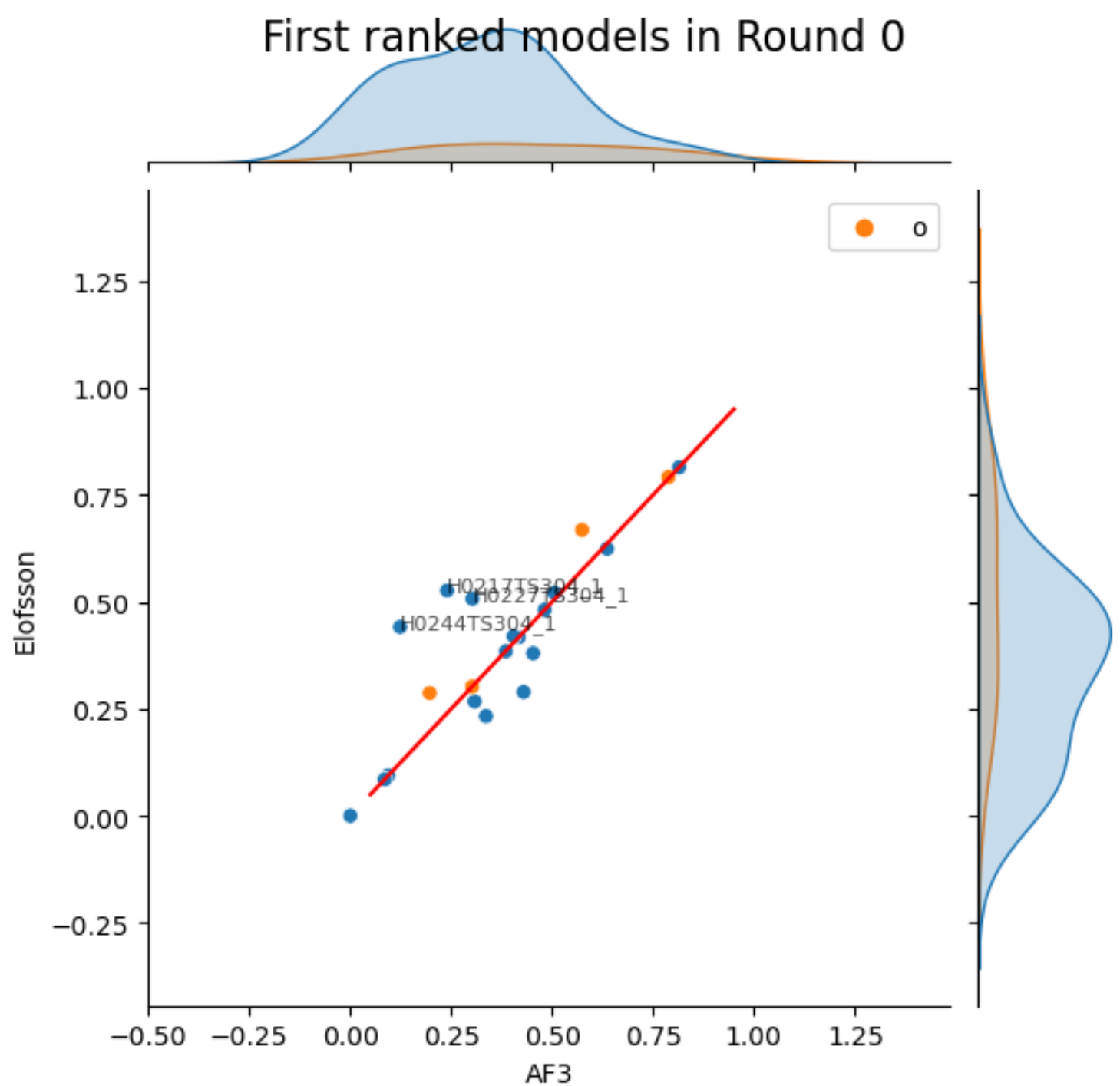
AF3 (rank 2)



Elofsson



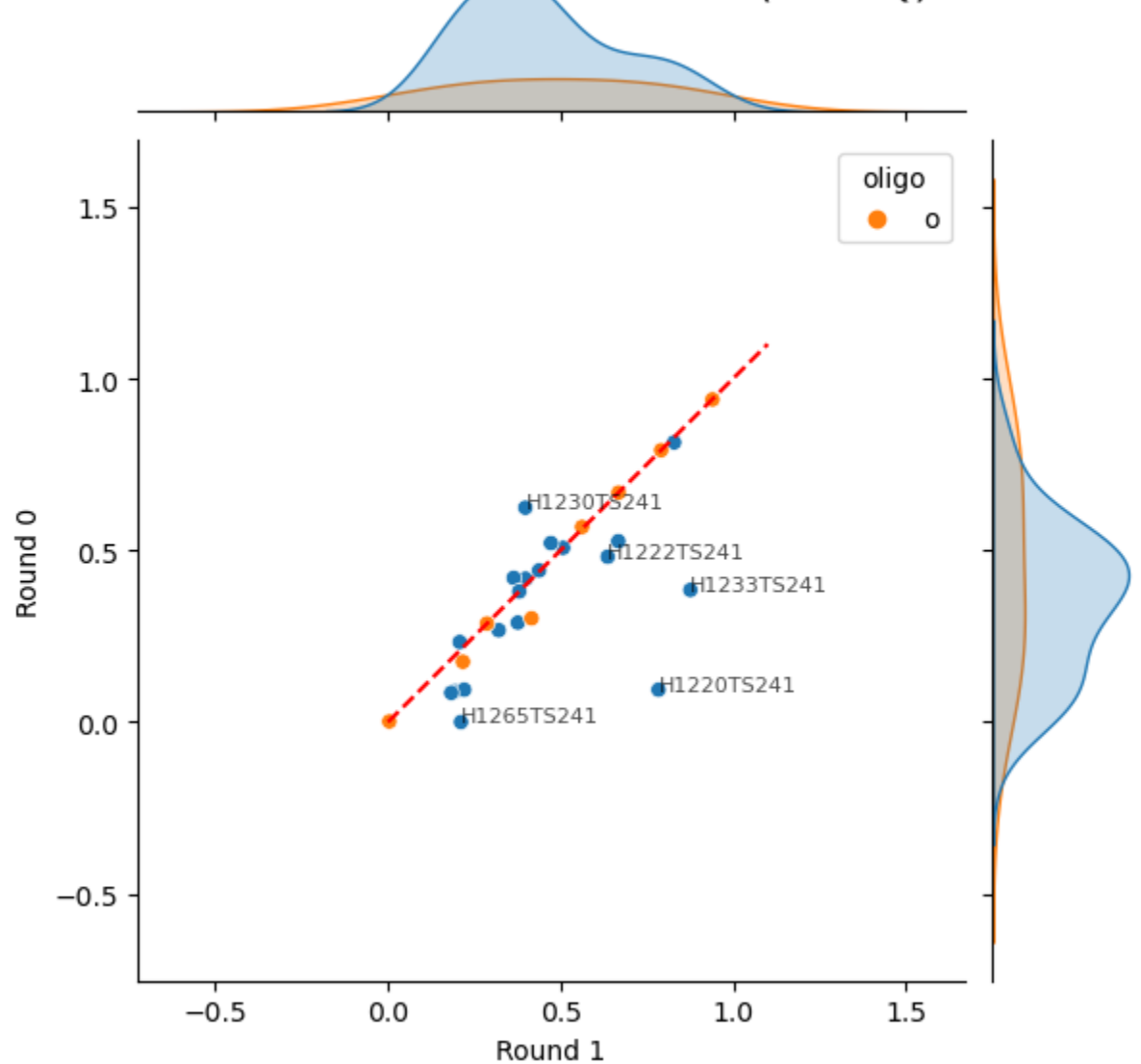
# Round 0 Elofsson vs AF3



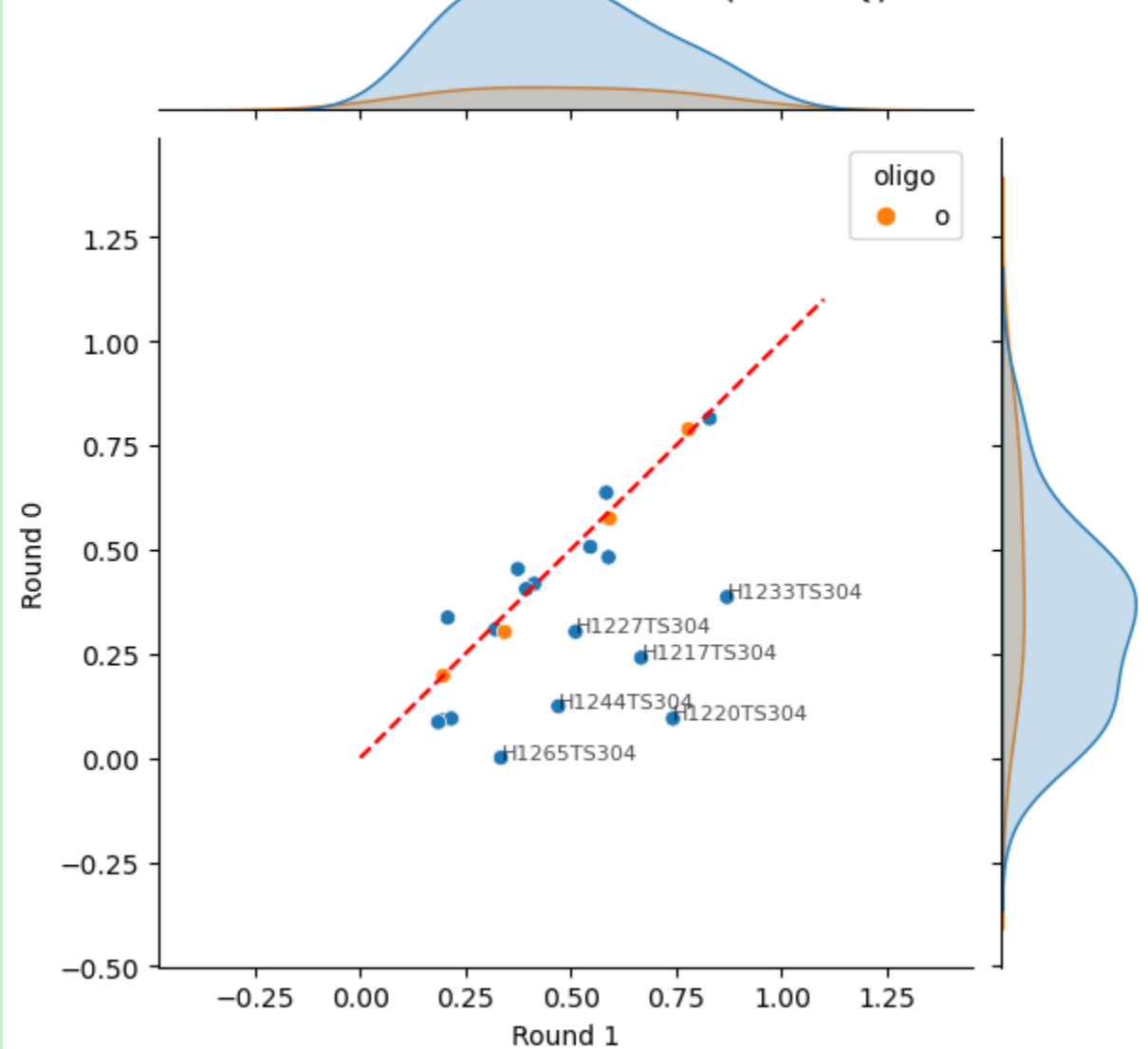


# Round 0 vs Round 1 (DockQ)

Round 0 vs 1 - Elofsson (DockQ)

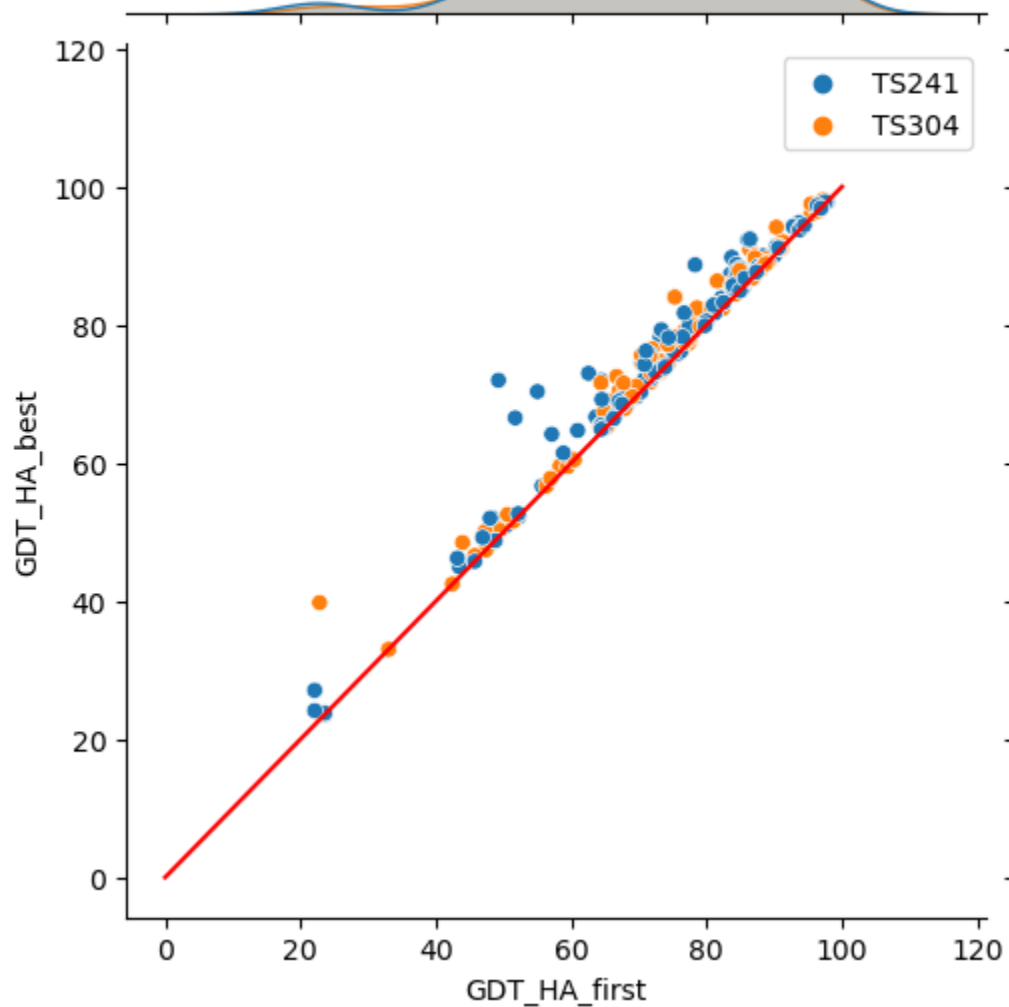


Round 0 vs 1 - AF3 (DockQ)

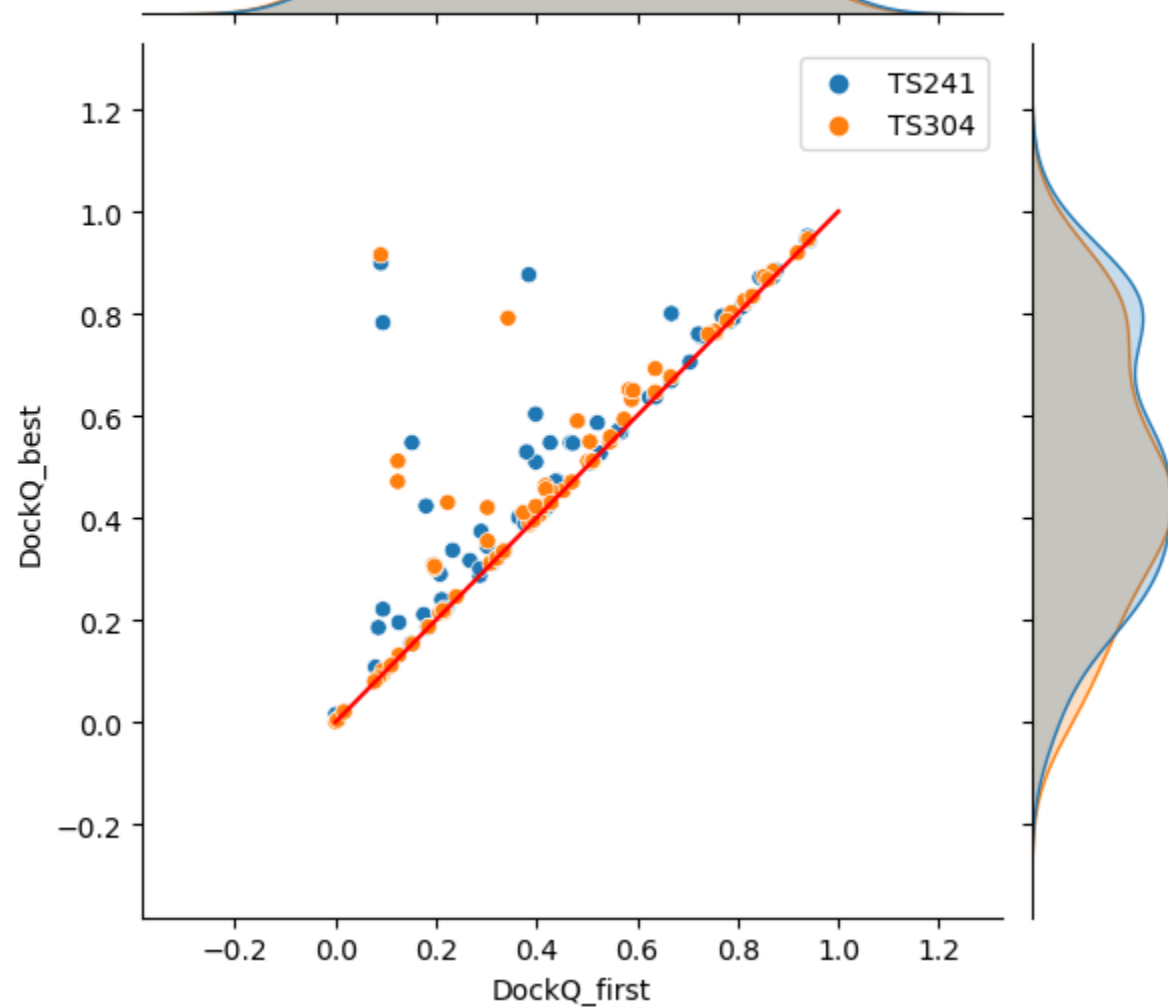


# First vs BEST

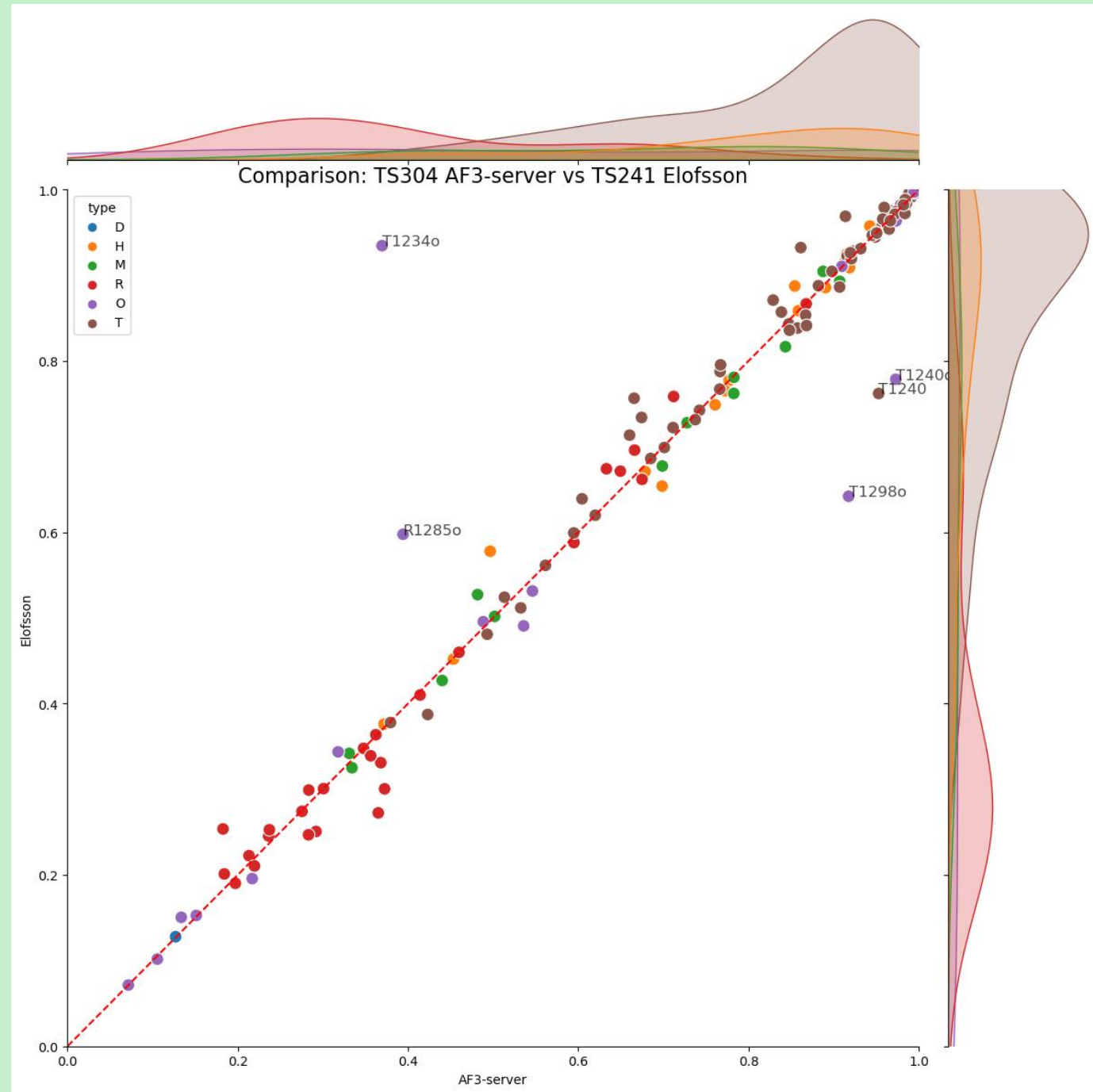
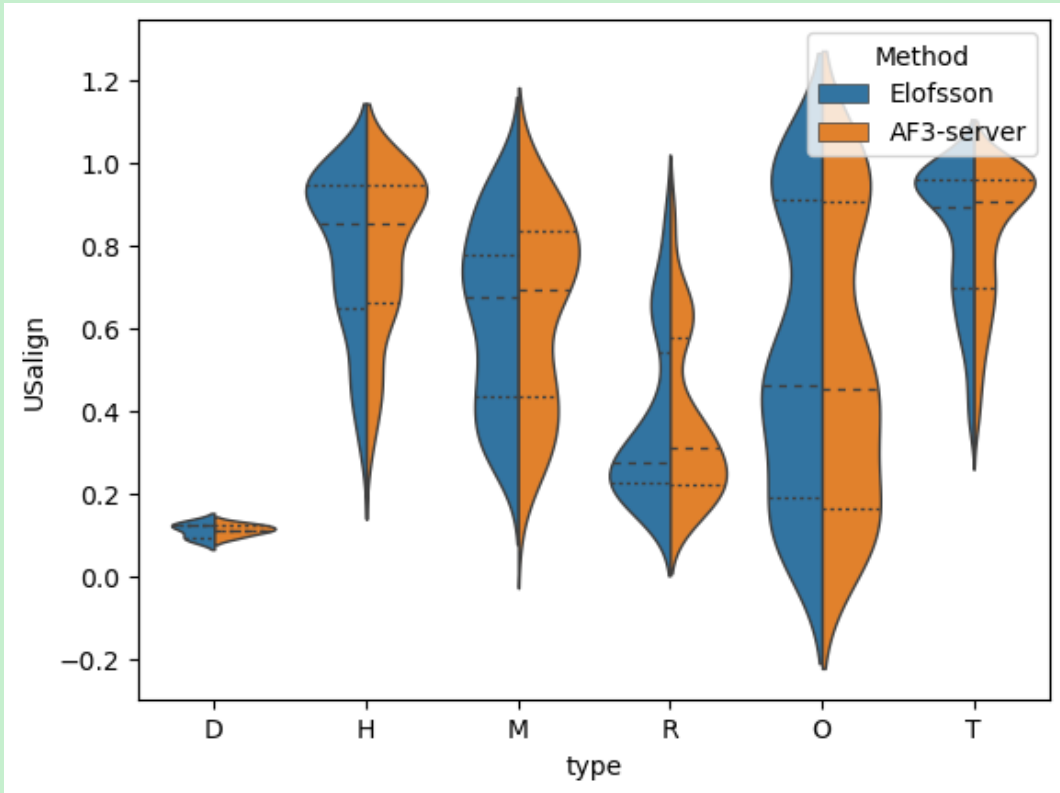
First vs Best (GDT\_HA)



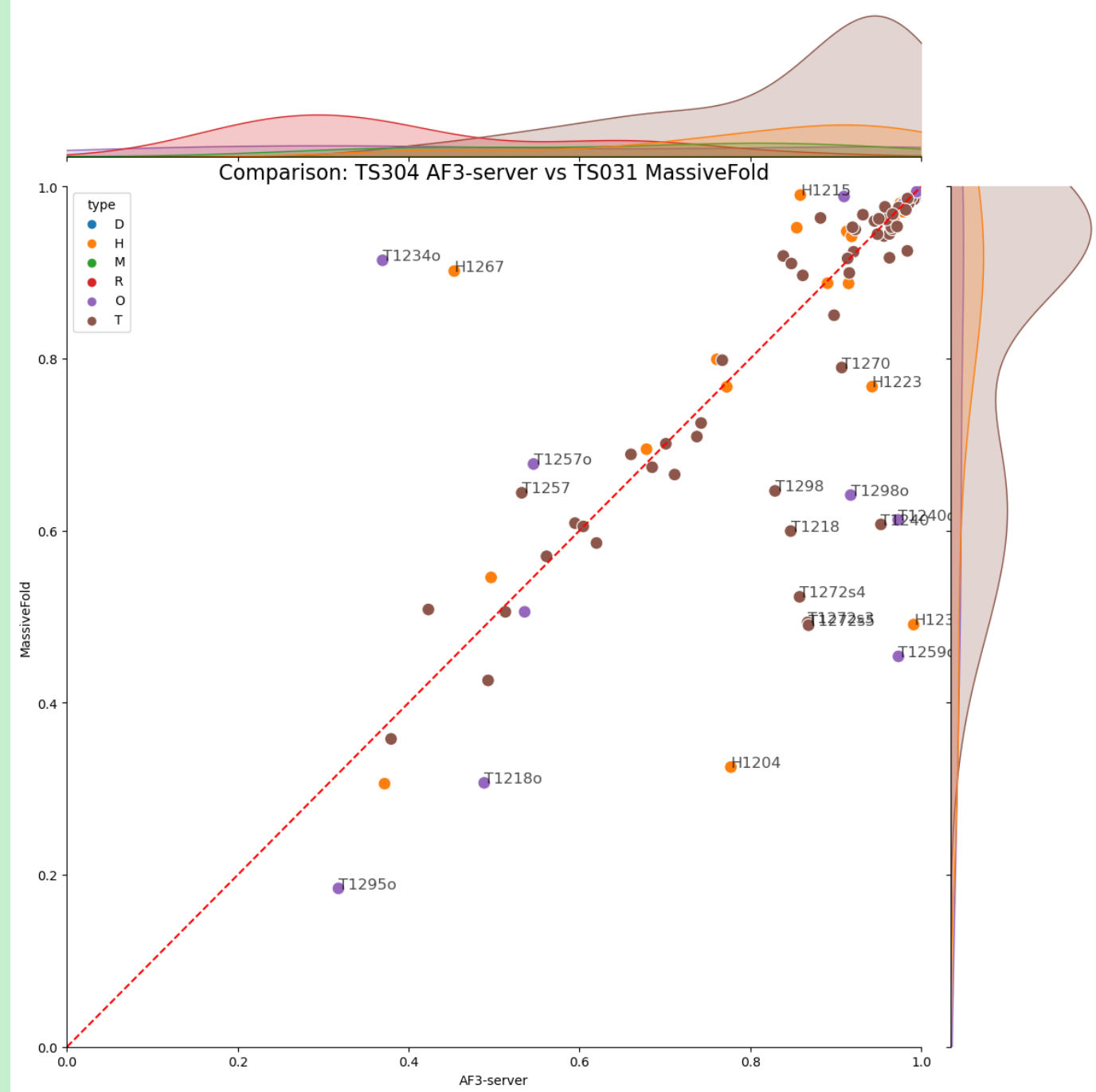
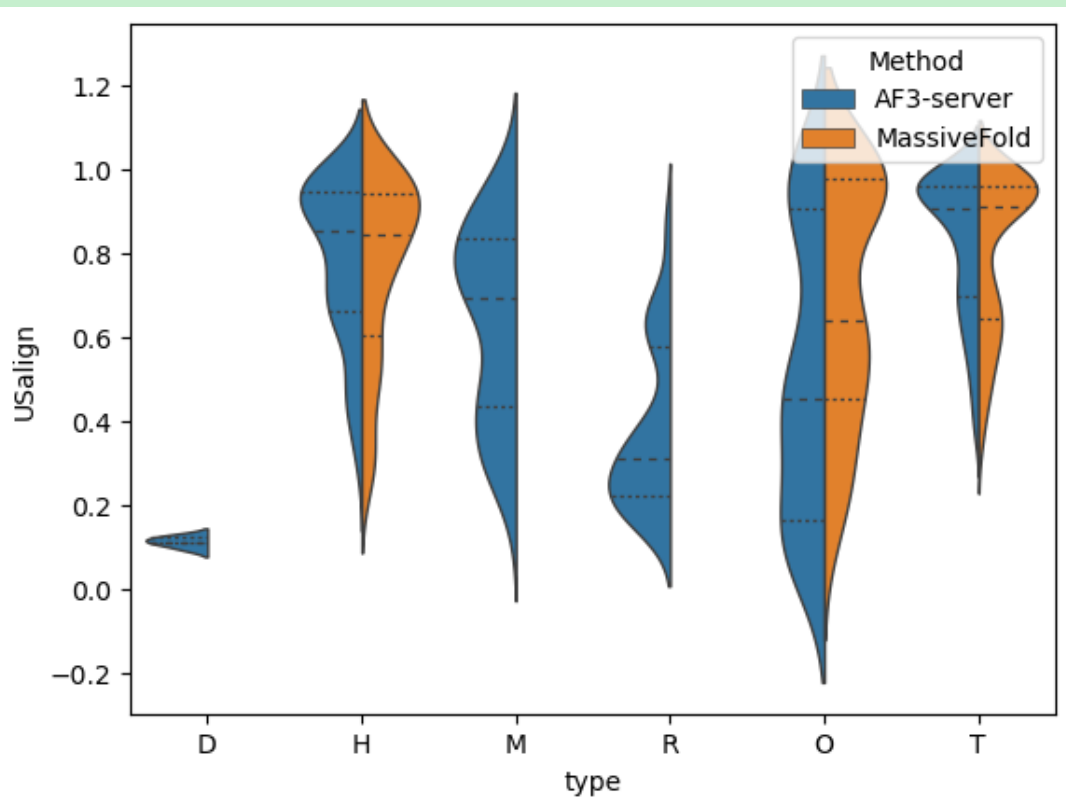
First vs Best (DockQ)



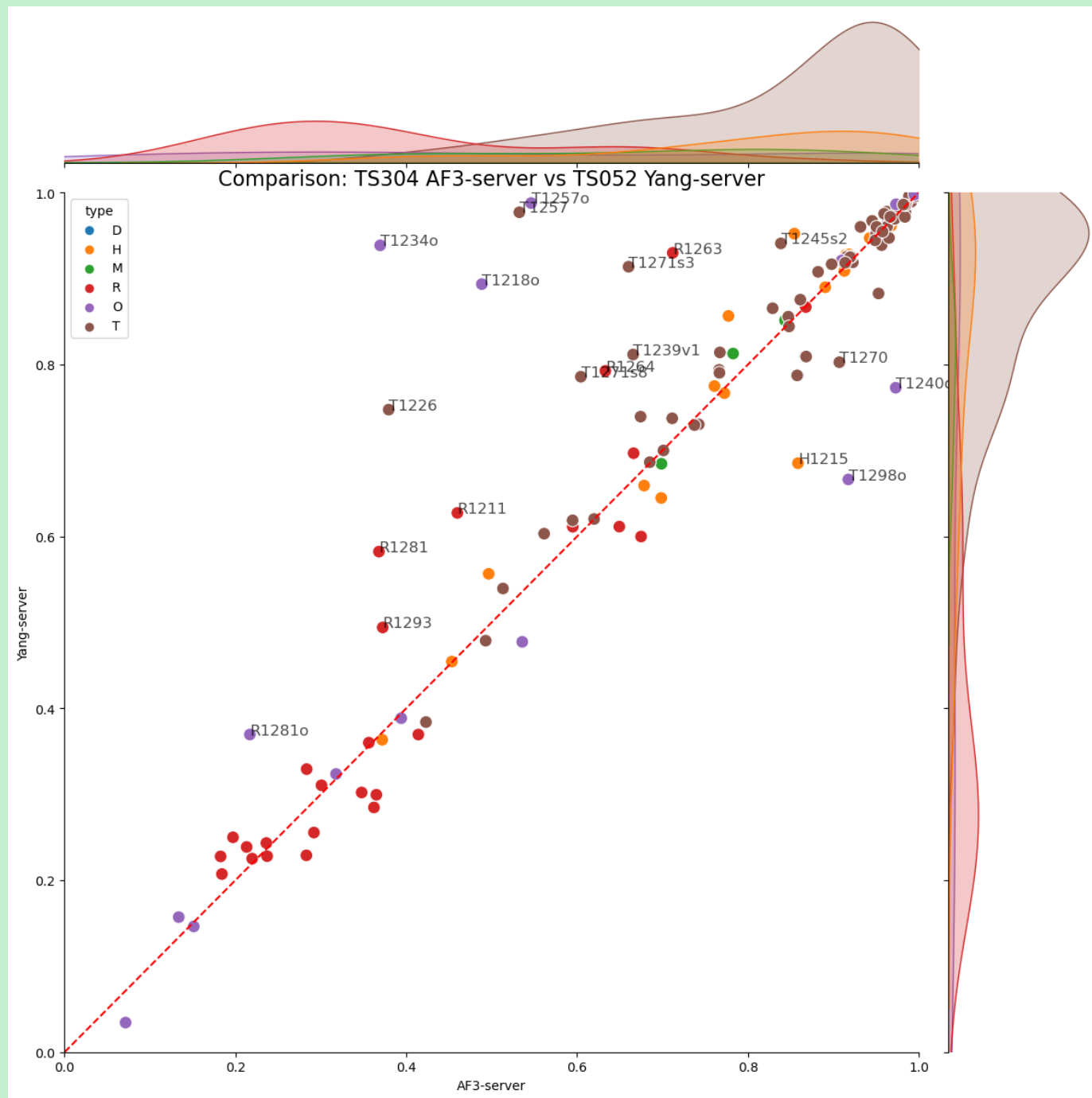
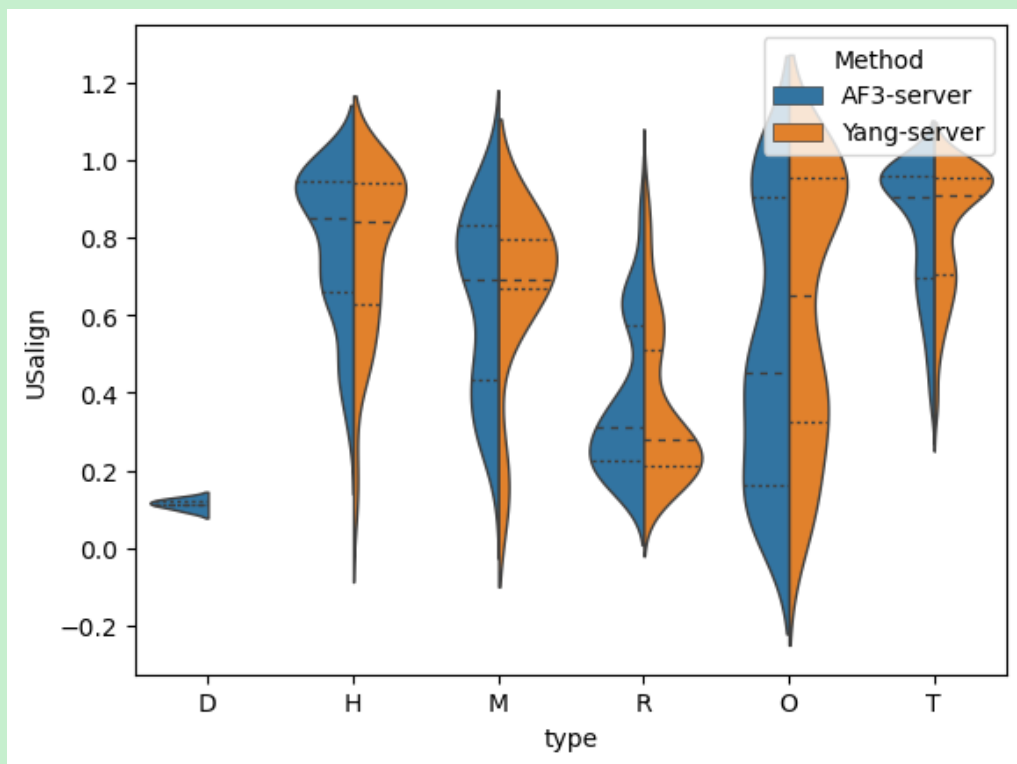
# AF3-server vs Elofsson, Rank 1 (USalign)



# AF3-server vs MassivFold, Rank 1 (USalign)



# AF3-server vs Yang-server, Rank 1 (USalign)





# Acknowledgements

The background of the slide is a blurred image of a protein structure, showing various loops and helices in shades of green, teal, and blue. Overlaid on this is the AlphaFold Server interface. The text 'AlphaFold Server' is prominently displayed in white. Below it, 'Powered by AlphaFold 3' is written in a smaller font. A white button with the Google logo and the text 'Continue with Google' is centered. At the bottom, a line of small text states: 'AlphaFold 3 model is a Google DeepMind and Isomorphic Labs collaboration'.

AlphaFold Server

Powered by AlphaFold 3

 Continue with Google

AlphaFold 3 model is a Google DeepMind and Isomorphic Labs collaboration