



# CASP 9

## EVALUATION OF DISORDER PREDICTION

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## Participating groups:

- 32
- server - 22
- human - 10



## Definition of disorder:

- ❖ lack of coordinates  
or
- ❖ variation of spatial positions of corresponding residues in chains (X-ray) or models (NMR) by more than  $3.5\text{\AA}$

>3 consecutive residues in disorder segments



## Format of predictions:

- binary indicator of residue disorder (O/D)
- probability of residue disorder

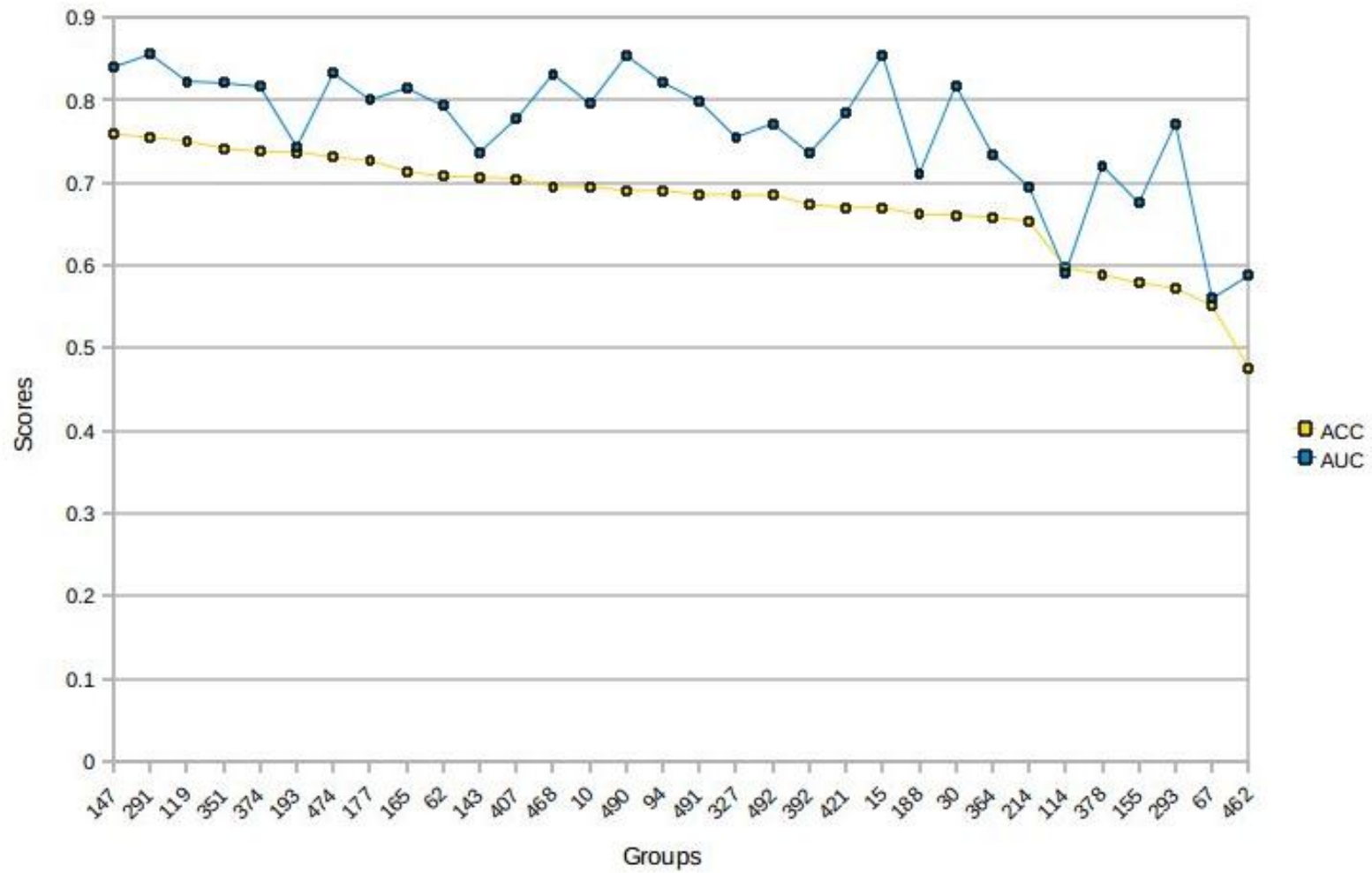


Scores:

- $$\text{Sensitivity} = \frac{TP}{TP + FN} = \frac{TP}{N_d}$$
$$\text{Specificity} = \frac{TN}{TN + FP} = \frac{TN}{N_o}$$
$$\text{ACC} = \frac{\text{Sensitivity} + \text{Specificity}}{2}$$
$$S_w = \frac{W_d TP - W_o FP + W_o TN - W_d FN}{W_d N_d + W_o N_o}$$
- AUC for  $(TP\_rate(p), FP\_rate(p))$

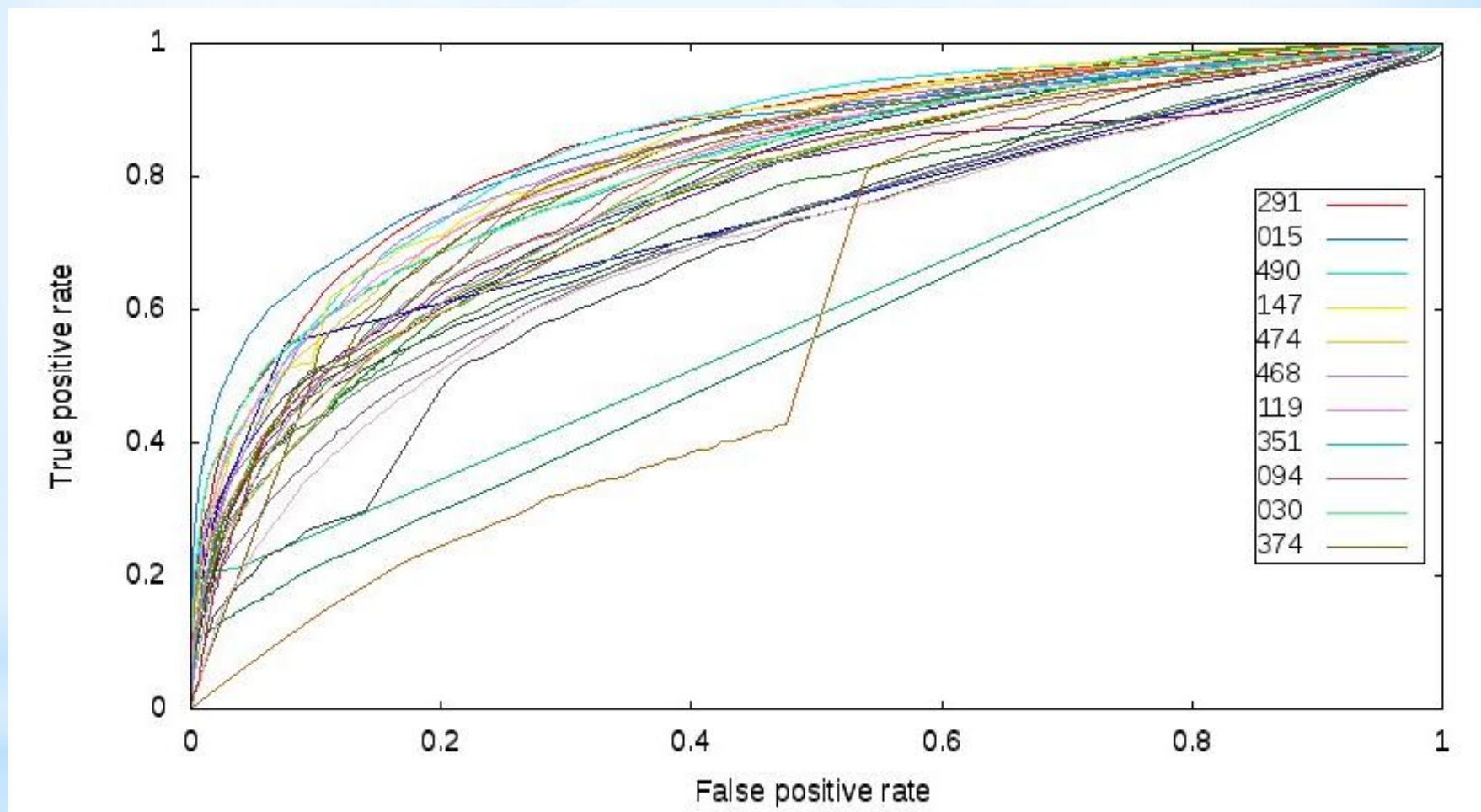


## ACC, AUC by group





# ROCs





Ranking of groups was performed according to three scores:

ACC, AUC and  $Z_{\text{score, total}}$ .

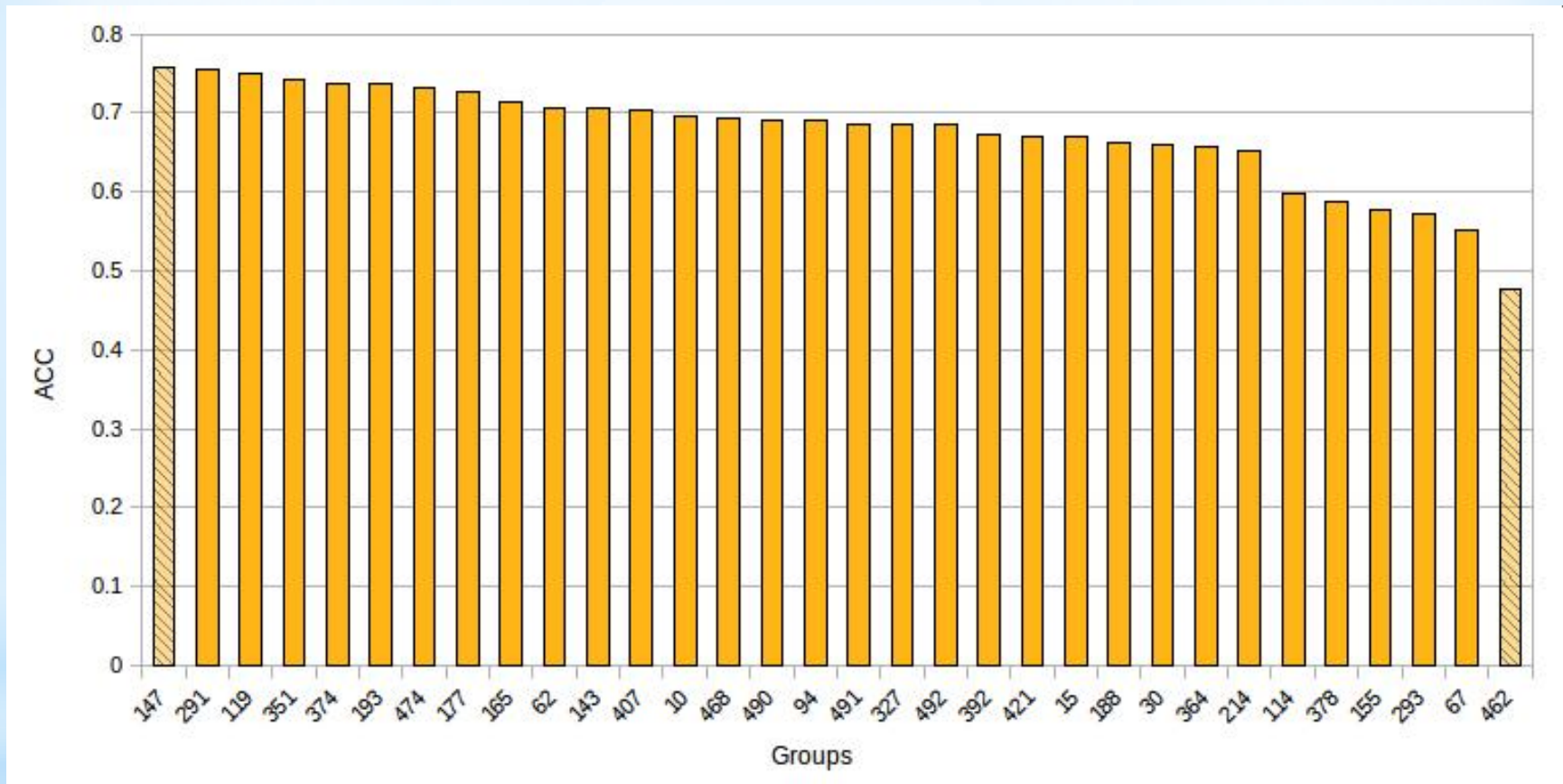
$Z_{\text{score, total}}$  was calculated as a sum of two Z scores:

$$Z_{\text{score, total}} = Z_{\text{score, ACC}} + Z_{\text{score, AUC}}$$





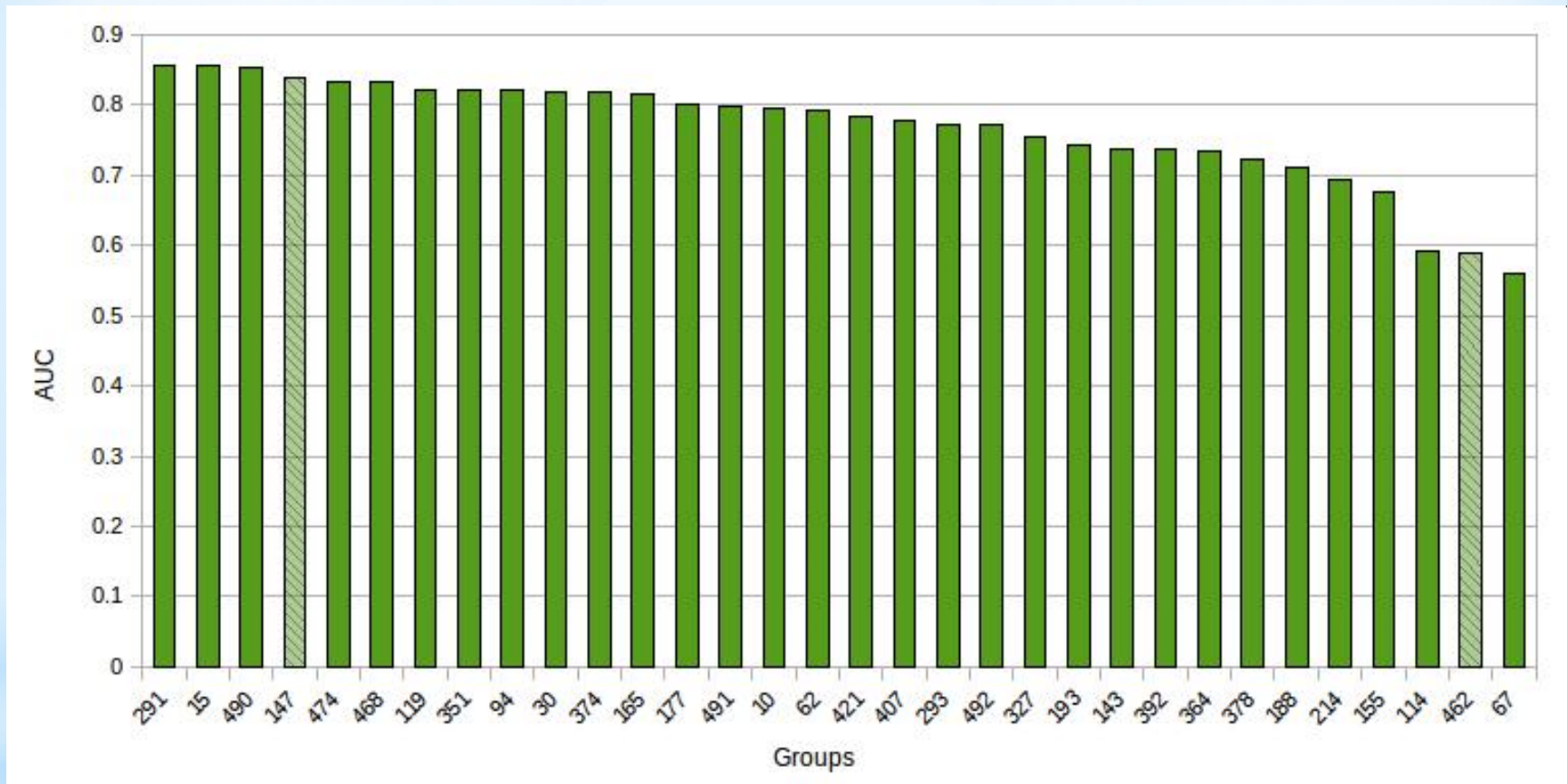
# ACC



\* Groups 147 and 462 (dashed bars) submitted predictions for only 53 and 57 targets respectively out of 112 targets evaluated.

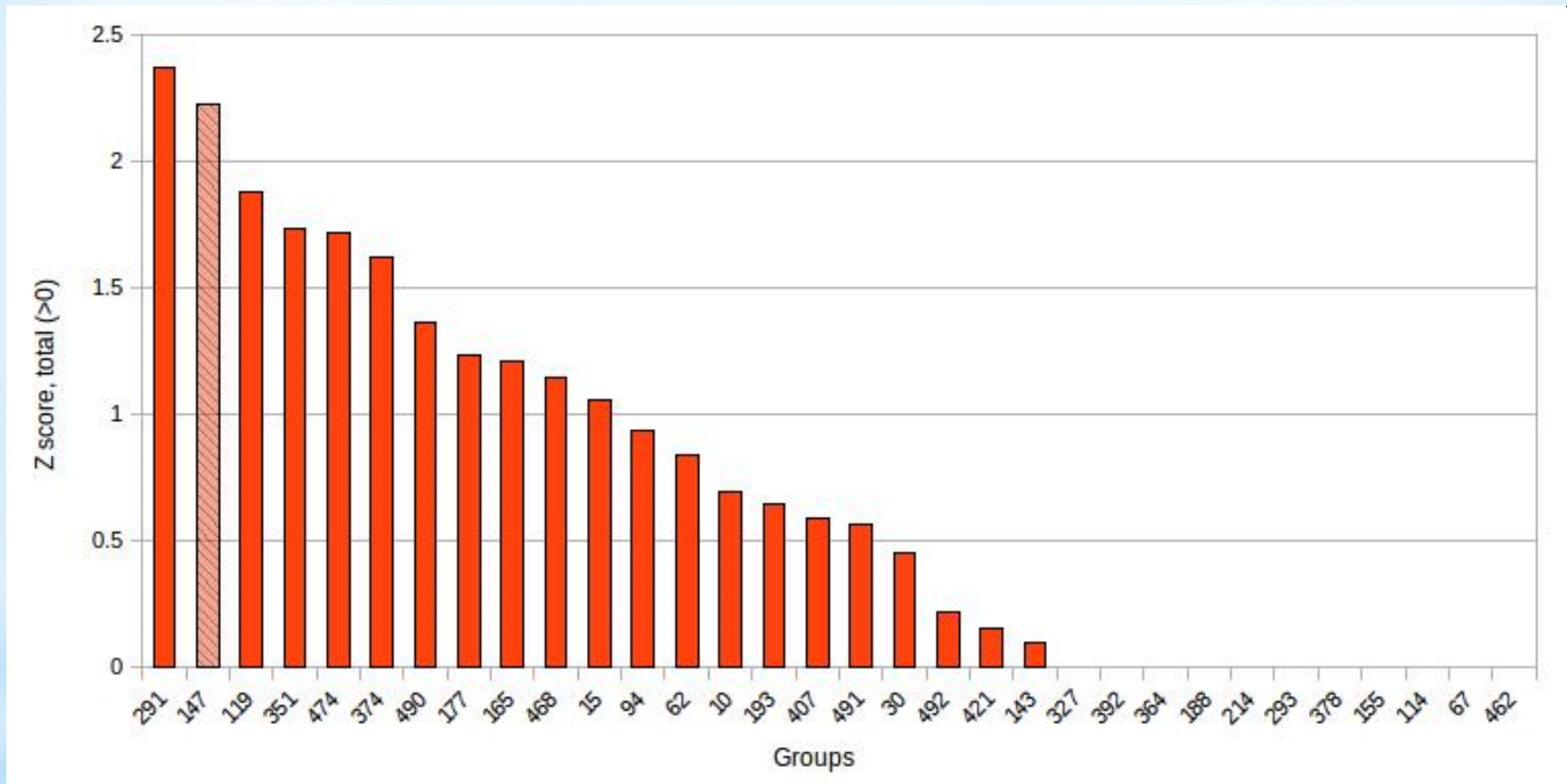


# AUC





## Z score, total (>0)





## CASP9 best groups

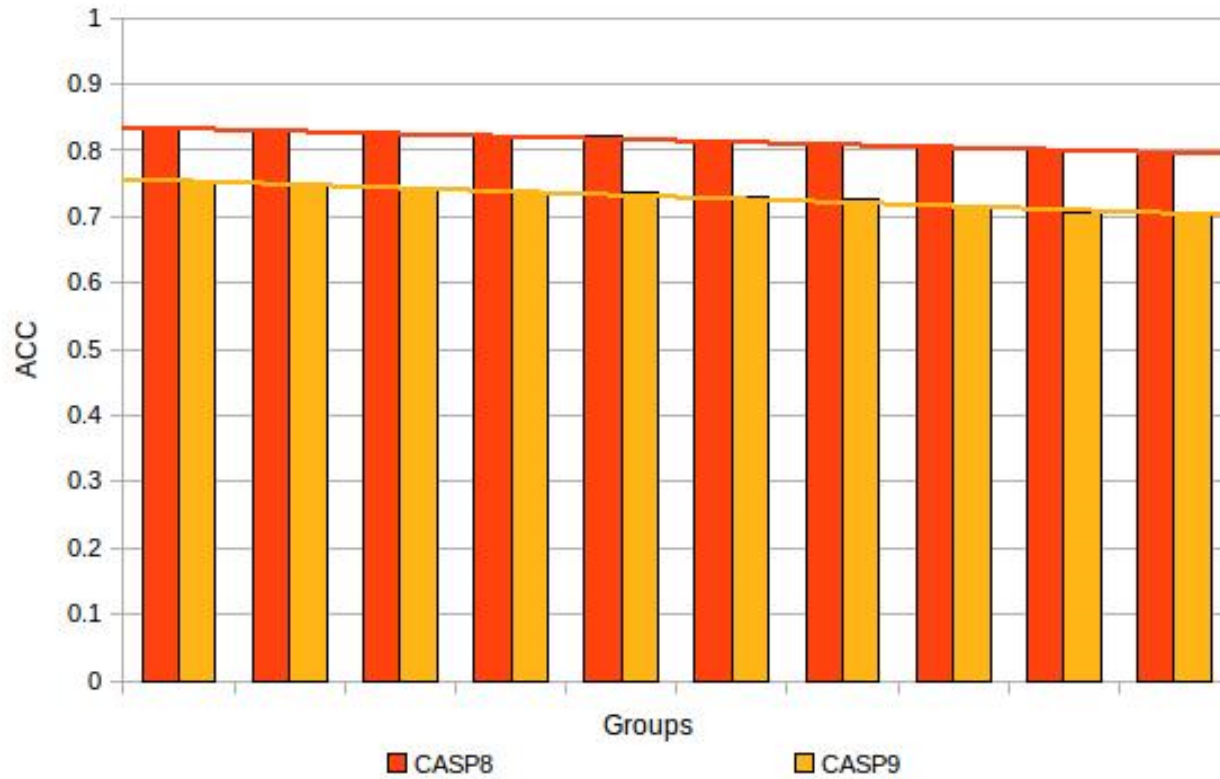
(ranking according to the ACC score)

Rank	Group name	Group	Nb targets	Sens	Spec	ACC	Sw	AUC
	GeneSilico	147	53	0.65441	0.86211	0.75826	0.51652	0.83911
1	prdos2	291	117	0.60784	0.90109	0.75446	0.50893	0.85463
2	MULTICOM-REFINE	119	117	0.6499	0.85016	0.75003	0.50005	0.82198
3	biomine_DR_pdb	351	117	0.59794	0.8849	0.74142	0.48284	0.82073
4	GSmetaDisorderMD	374	117	0.65402	0.82192	0.73797	0.47594	0.81636
5	mason	193	116	0.55317	0.91975	0.73646	0.47292	0.74283
6	ZHOU-SPINE-D	474	117	0.57938	0.88275	0.73106	0.46213	0.83181
7	Distill-Punch1	177	106	0.57149	0.88137	0.72643	0.45287	0.80009
8	GSmetaserver	165	117	0.57196	0.85455	0.71326	0.42651	0.81396
9	ZHOU-SPINE-DM	62	117	0.53567	0.87898	0.70733	0.41465	0.79239
10	OnD-CRF	143	112	0.62989	0.78232	0.7061	0.4122	0.73658

*\* Group 147 (GeneSilico) submitted predictions for only 53 targets and was not ranked*



## Comparison with CASP8 (ACC, best 10 groups)





## Comparison with CASP8 (AUC, best 10 groups)

