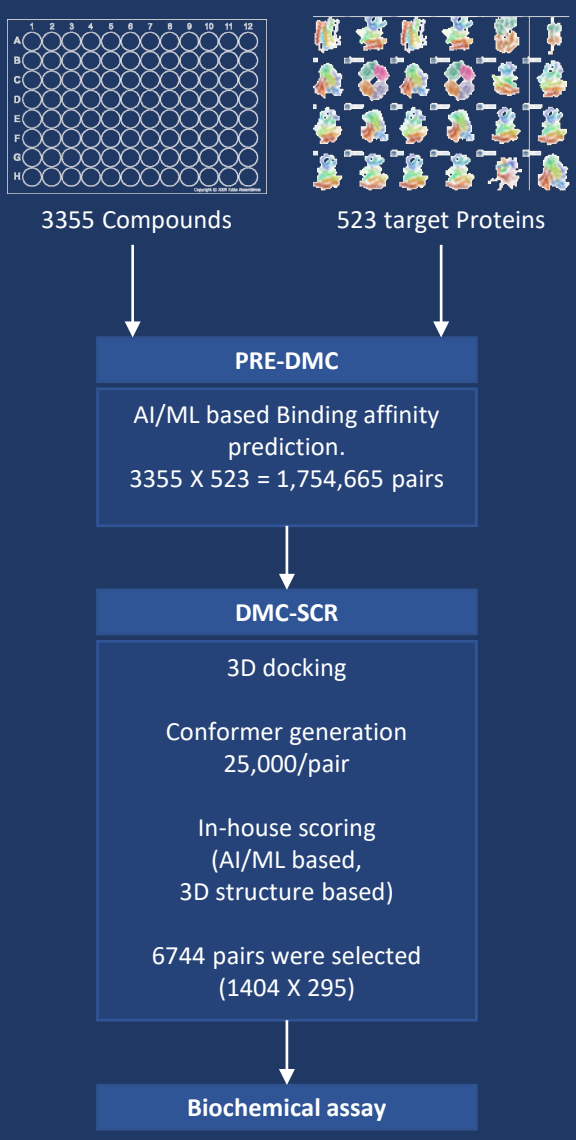
Drug Repositioning

Discovering new target of known drugs with DeepMatcher® Platform.

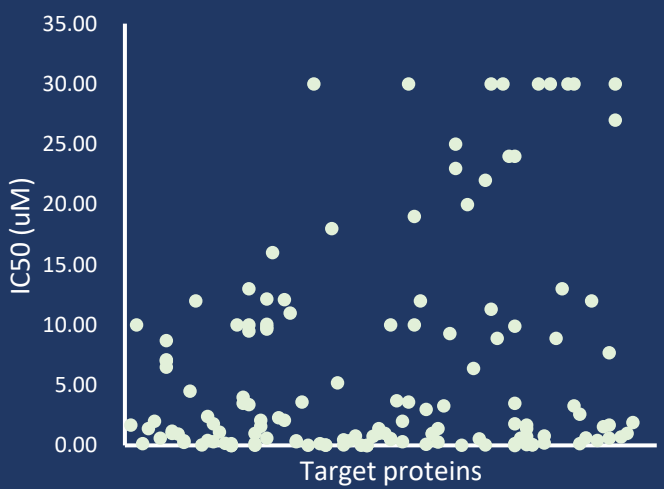
Drug repositioning is a promising approach for discovering new treatments for disease. By re-purposing existing drugs or compounds, drug repositioning can significantly reduce the cost and time of the drug discovery process. Additionally, drug repositioning can provide new insights into the underlying causes of a disease, and has been shown to have higher success rates than traditional drug discovery and development. **Since the second half of 2021, Syntekabio has been conducting drug repositioning projects for 523 proteins based on 3355 compounds using its platform DeepMatcher® (DR2021), and is currently focusing on discovering and expanding new indications by securing 58 drug-new target combinations.**

	DeepMatcher Result	Primary screening	inhibition activity[3] ≤1uM
DeepMatehr® v1.5[2]	6744 pairs (295 targets, 1404 Cpds)		
Biochemical assay		437 pairs (124 targets, 299 Cpds)	
			58 pairs (39 targets, 49 Cpds)

Schematic Diagram of DR2021.



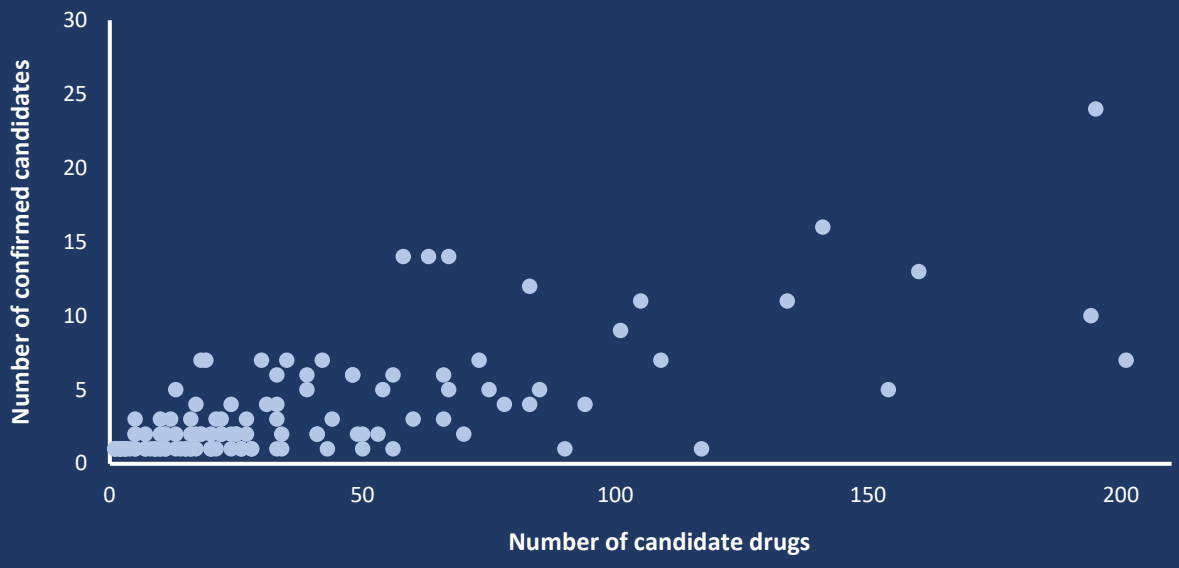
IC50 distribution of Primary result



IC50 values of a part of primary screening result including final selected 58 pairs are annotated. Total 152 pairs (87 target proteins with 124 drug pair) showed IC50 ranged from 0.51uM to 30uM.

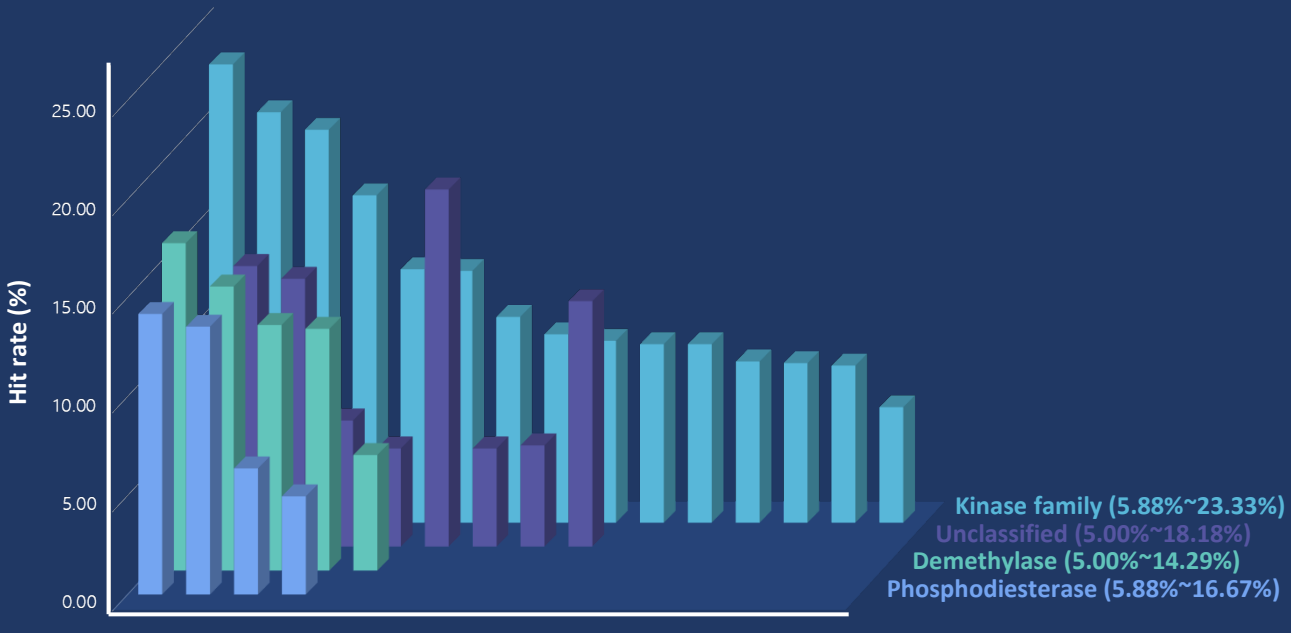
DeepMatcher® successfully selected a total of 6,744 drug-target pairs. Their effectiveness was tested with *in vitro* biochemical assays, then 437 drug-target pairs were primarily selected, and it showed that the overall hit rate of DeepMatcher® was about 6.4%. (table above) Interestingly, 58 drug-new target pairs of 437 primary screening results, had been proved that they have 1uM or less IC50 which indicates that there could be possibilities to repurpose the selected drug to new indication with new target proteins.

When analyzing the **Drug repositioning** results from the perspective of performance verification, the probability of deriving about 6.5% based on the company is confirmed. Estimated y = 0.0432x + 1.7331, If one hundred DeepMatcher® suggested drugs are carried out, it is expected that about 6 drugs can be secured.



Correlation between validation count and effective count of “Primary screening” result of DR2021.

When analyzing the types of the top 33 proteins based on the Hit rate of the primary screen among the DR2021 results, there exist fifteen kinds of kinases, five demethylases, four phosphodiesterase and nine unclassified proteins. The hit rate was confirmed with about 6 to 23% in the kinase group, 5 to 14% in the demethylase group, 6 to 17% in the phosphodiesterase group and 5 to 18% in unclassified protein group. Take together, DeepMatcher® is possible for various proteins to screening a suitable compounds.



Hit rate of top 33 protein targets in DR2021 project.