FE-NES: From Design Hypothesis to Confident Synthesis Decisions in a Single Workday

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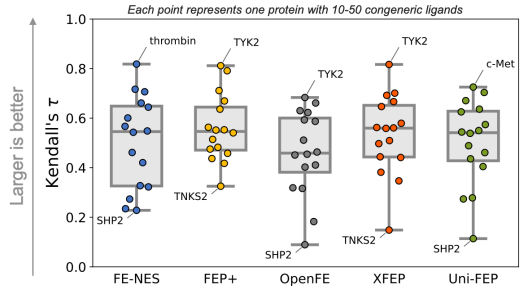
Summary:

- Evaluate hundreds of molecules in hours and thousands overnight.
- Achieve rank ordering comparable to other affinity prediction methods.
- Evaluate 2-5x more molecules than standard equilibrium methods with the same GPU allocation.

Product Keywords: FE-NES, MD, Orion®

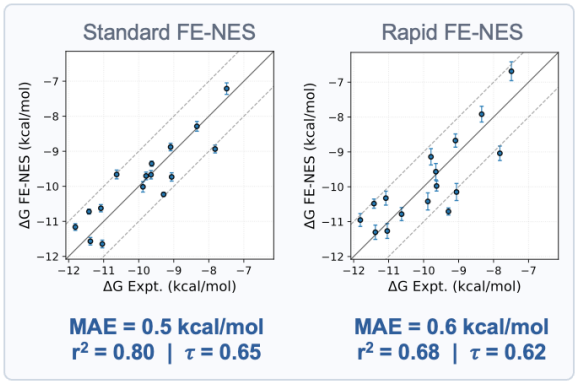
Abstract:

Binding affinity predictions only matter when they arrive in time to inform decisions. FE-NES delivers fast, accurate results through massive parallelization and efficient sampling. Start with a design hypothesis in the morning, prepare your protein, build your molecules, and launch FE-NES. By afternoon, you have the results you need to decide which molecules to make next.



FE-NES delivers rank ordering comparable to other free energy methods. Targets from [1,2]. Other methods from [3-6].

When you need more scale, tunable FE-NES settings let you evaluate three times as many molecules for the same computational budget, usually with similar rank ordering. A 500-molecule FE-NES run on Orion can inform an afternoon selection discussion with Rapid settings or the next day's work with standard settings. Concurrent execution increases total capacity without dramatically changing the turnaround time of each run. Ten parallel 500-molecule calculations provide 5,000 predictions per day.



FE-NES binding affinity predictions for the TYK2 benchmark set [1]. Rapid settings trade a small decrease in prediction accuracy and rank ordering for a 3x increase in throughput.

Whether you use the defaults or tune the settings to meet your needs, FE-NES helps you test more ideas, sooner, and make informed decisions about what to synthesize next.

Source: OpenEye, Cadence Molecular Sciences, webinar September 2026.

(https://youtu.be/vkrRSF1vexk)

[1] Wang et al., J. Am. Chem. Soc. 137, 2695 (2015)
[2] Schindler et al., J. Chem. Inf. Model. 60, 5457 (2020)
[3] Ross et al., Commun. Chem. 6, 222 (2023)
[4] Baumann et al., J. Chem. Inf. Model. 66, 6429 (2026)
[5] Xue et al., J. Chem. Theory Comput. 20, 799 (2023)
[6] Zou et al., chemrxiv-2025-rf8mf (2025)

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