

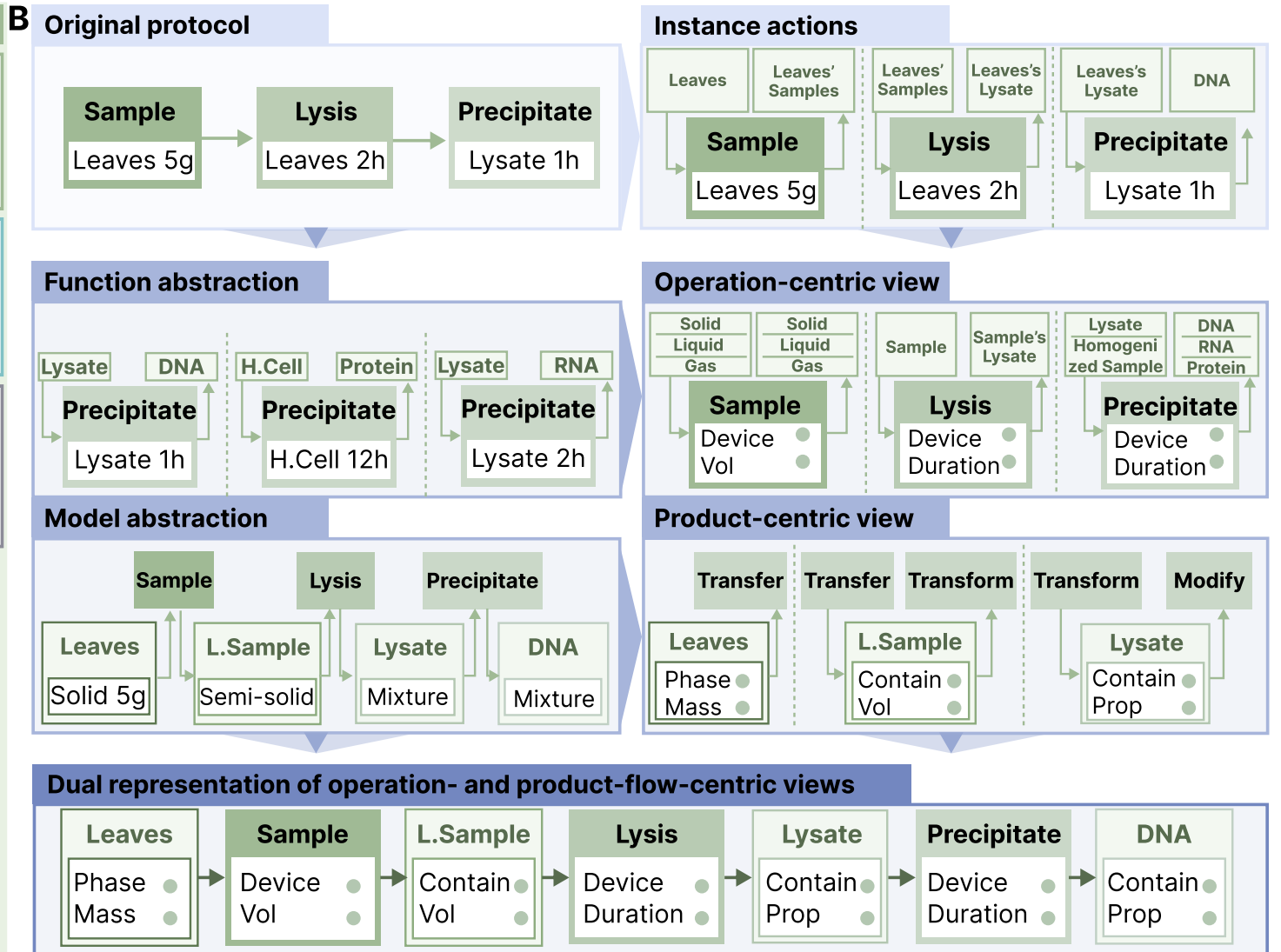
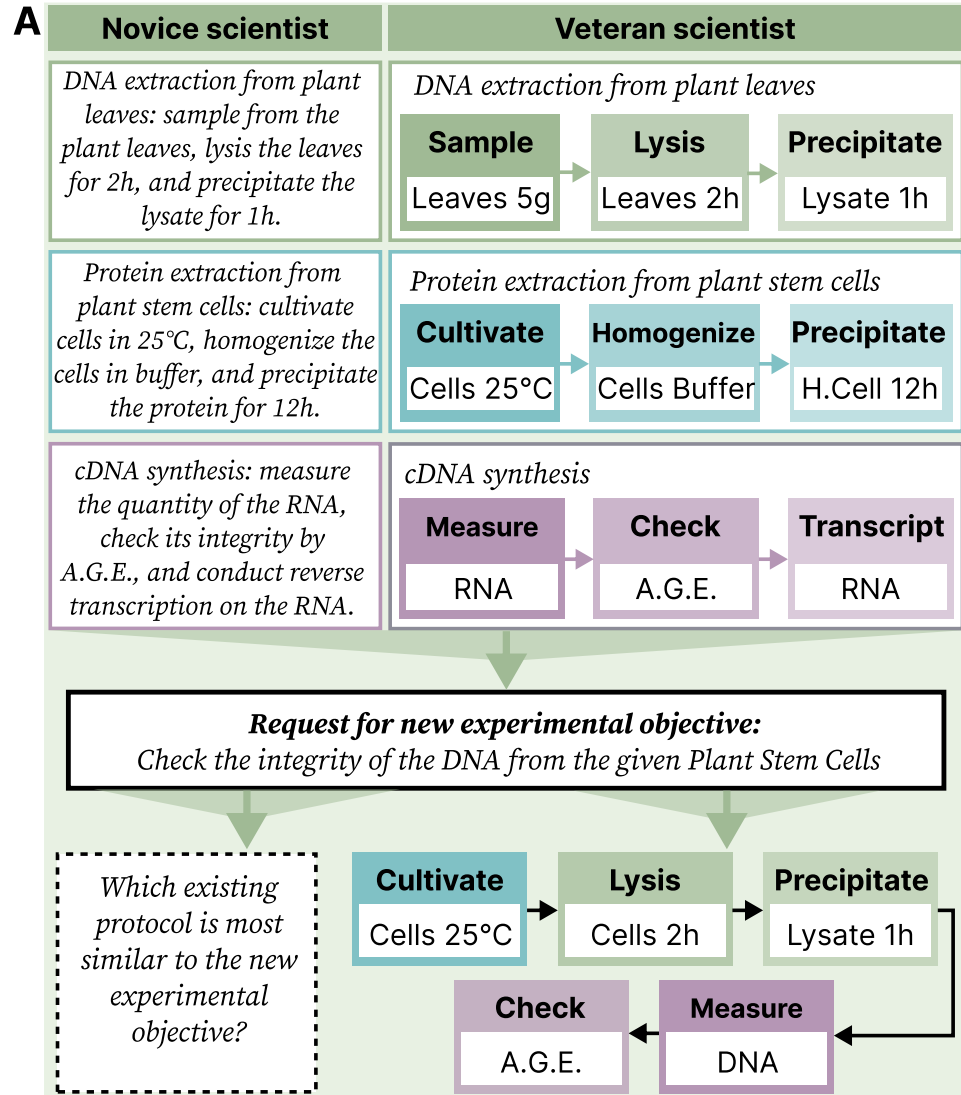
# Hierarchically Encapsulated Representation for Protocol Design in Self-Driving Labs

Yu-Zhe Shi<sup>1</sup>, Mingchen Liu<sup>2</sup>, Fanxu Meng<sup>1</sup>, Qiao Xu<sup>1</sup>, Zhangqian Bi<sup>2</sup>, Kun He<sup>2</sup>, Lecheng Ruan<sup>1</sup>, Qining Wang<sup>1</sup>

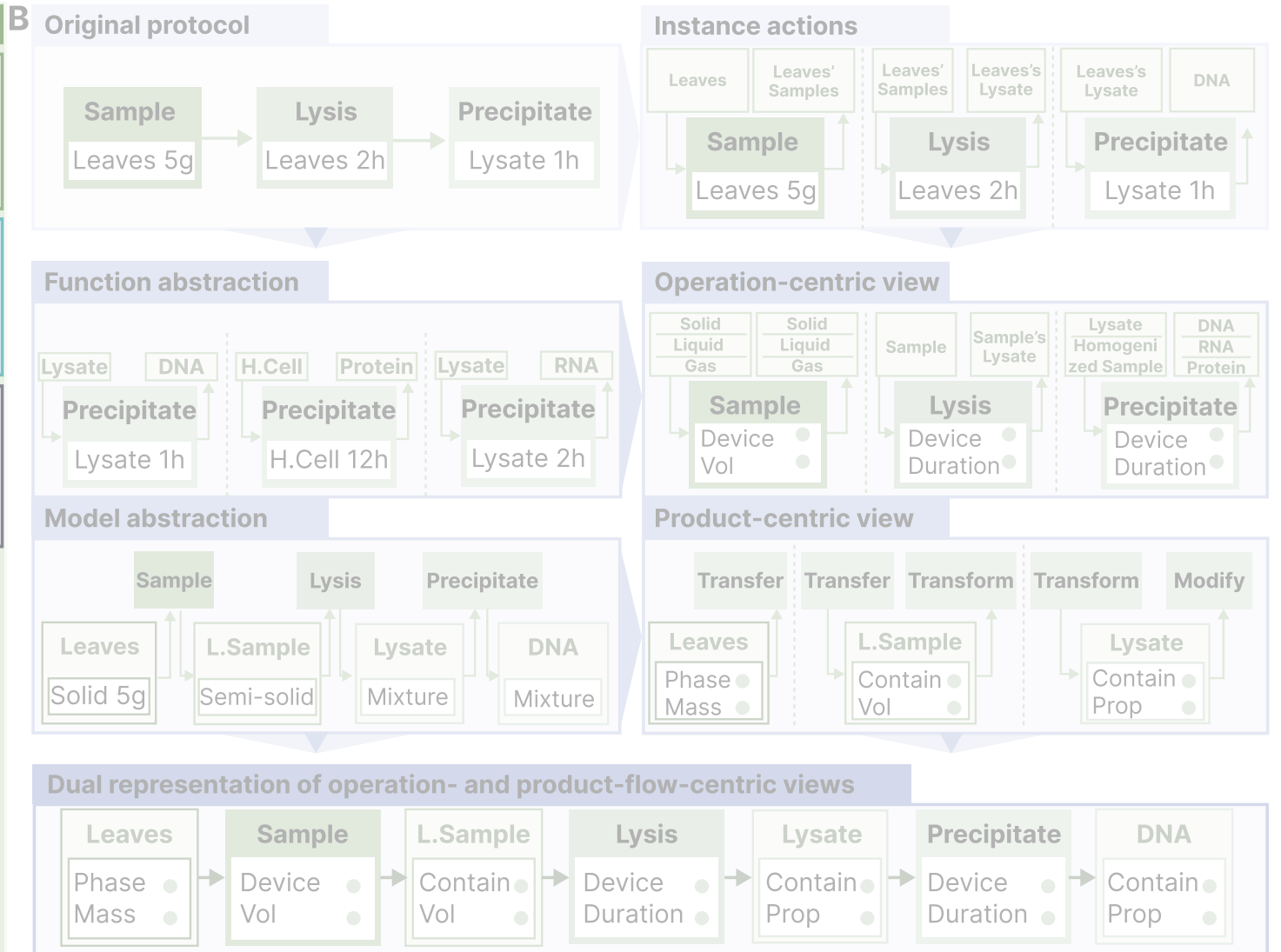
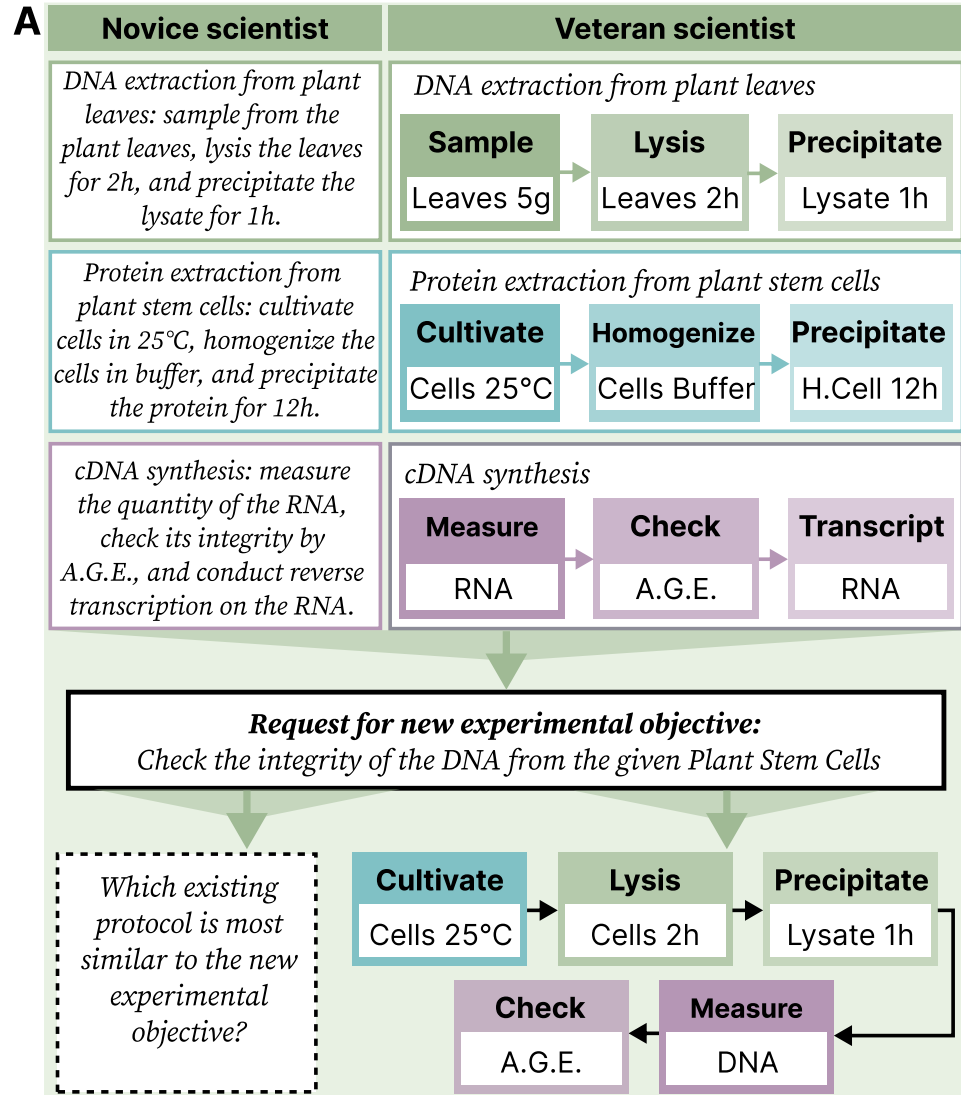
<sup>1</sup>Department of Advanced Manufacturing and Robotics, Peking University

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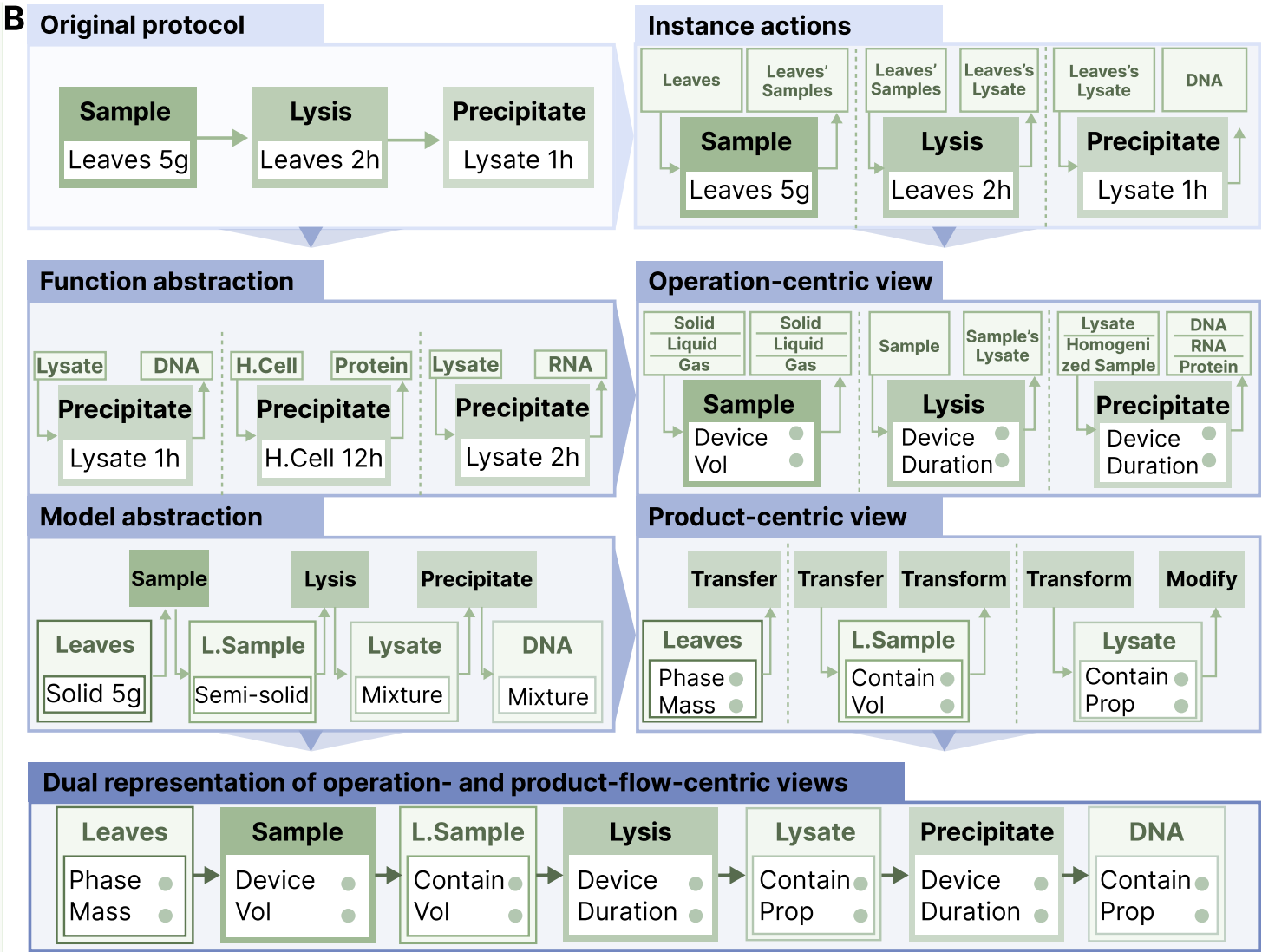
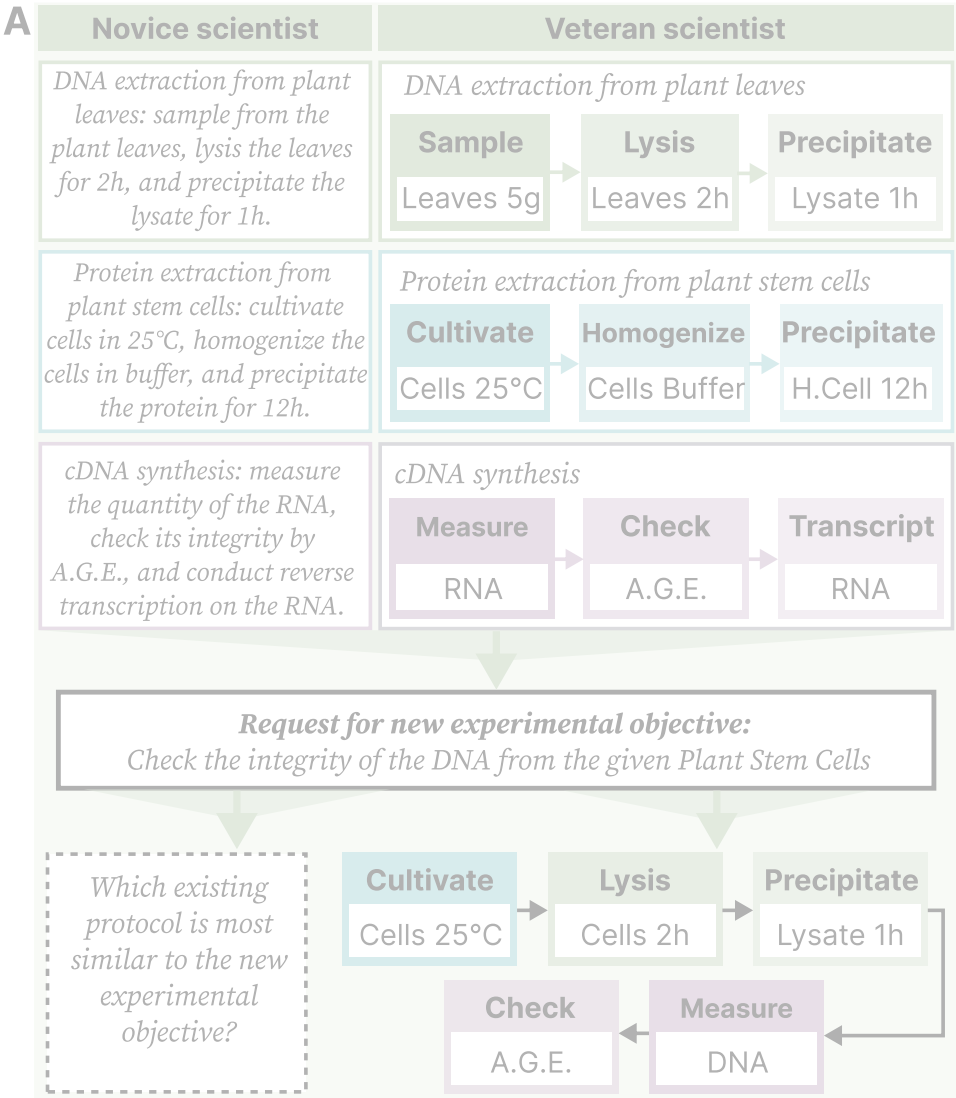
# The representations for protocol design



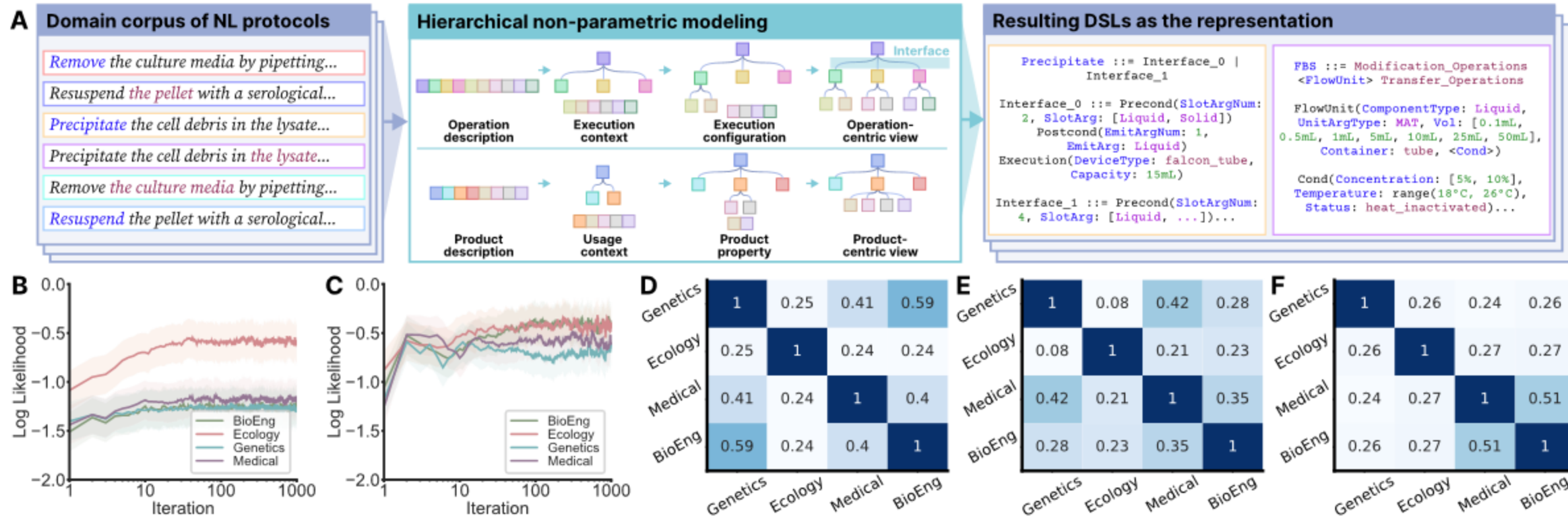
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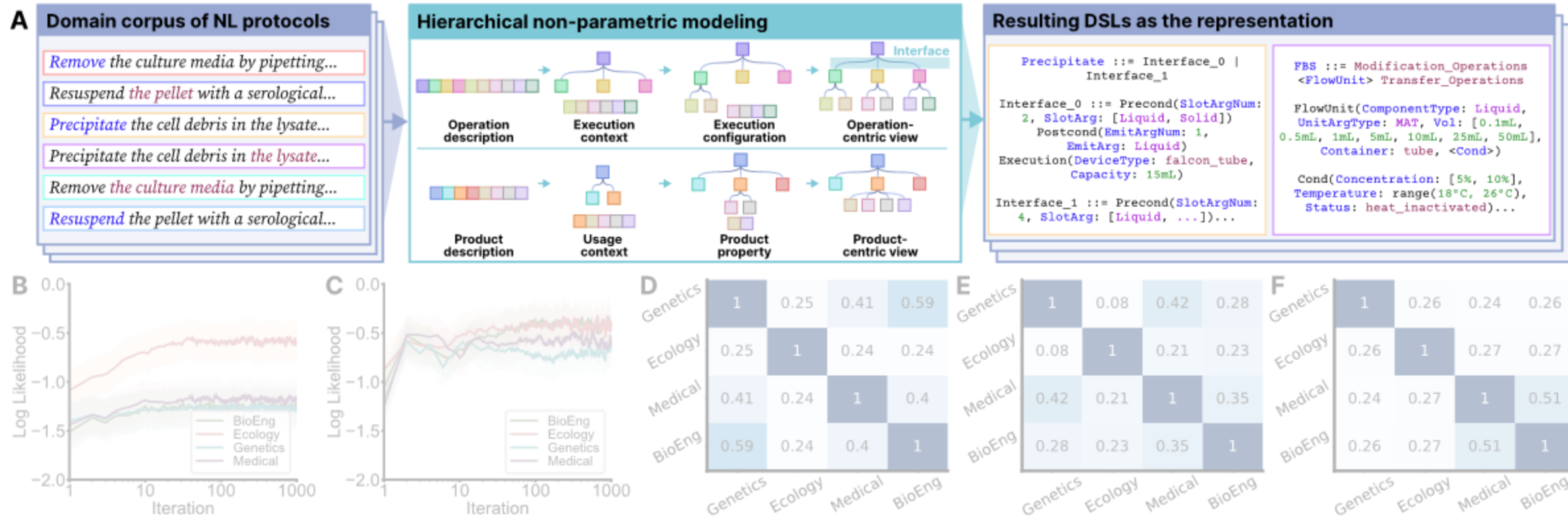
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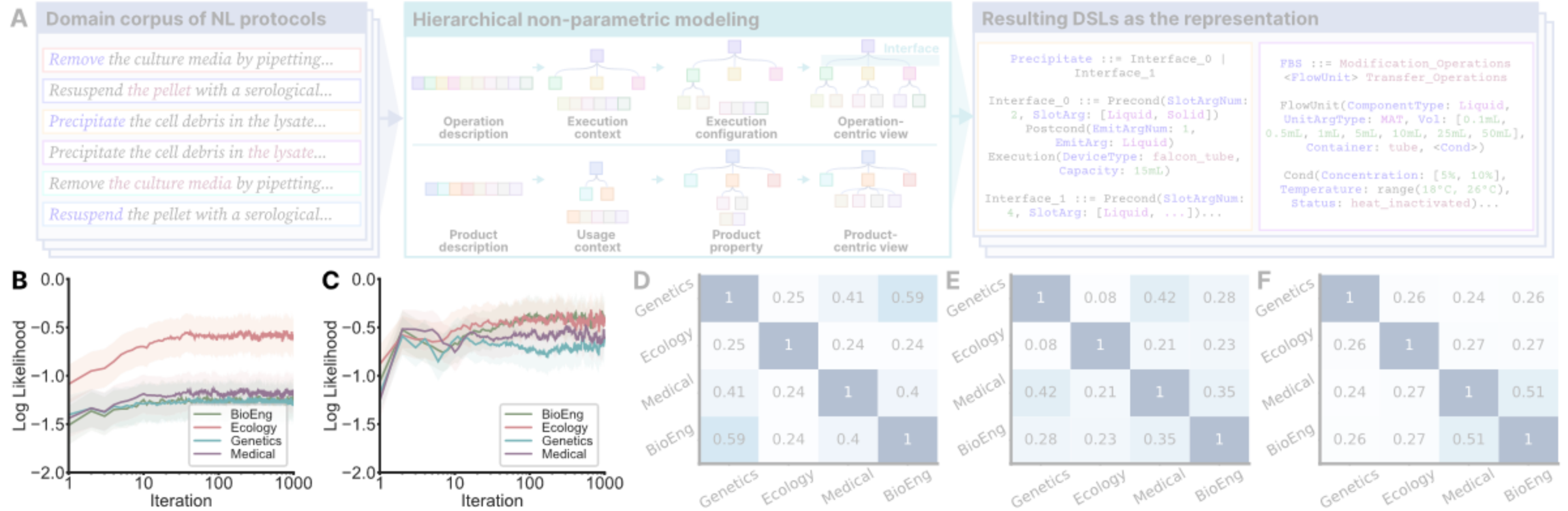
# Automatic representation generation



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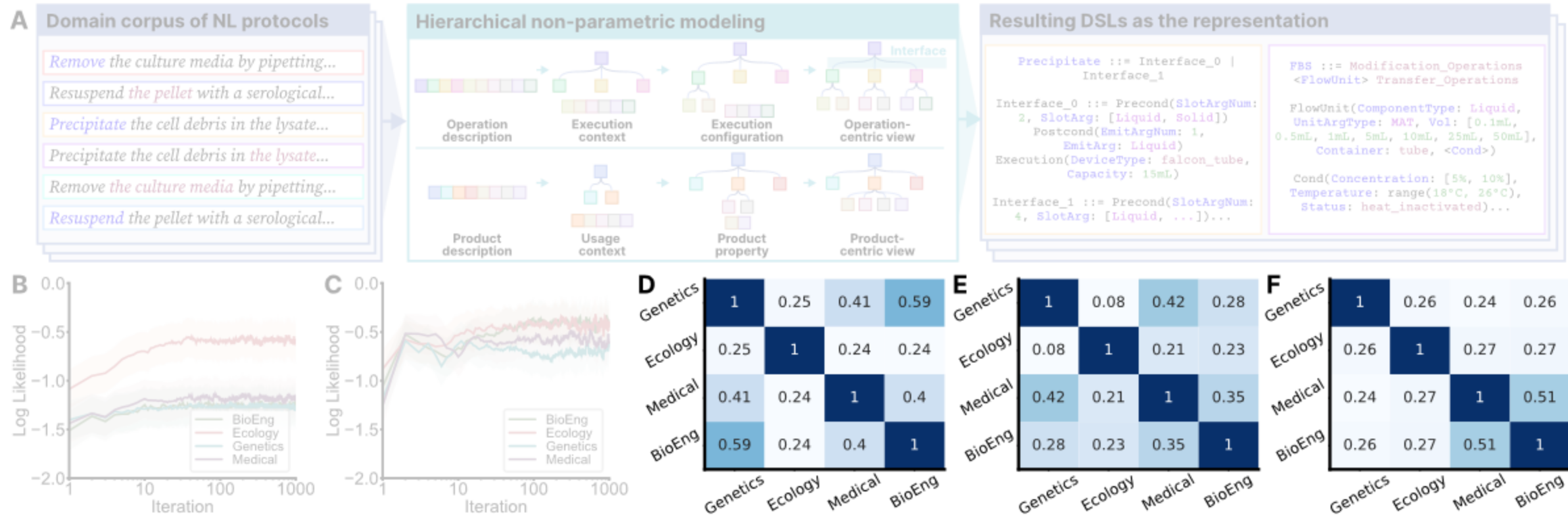


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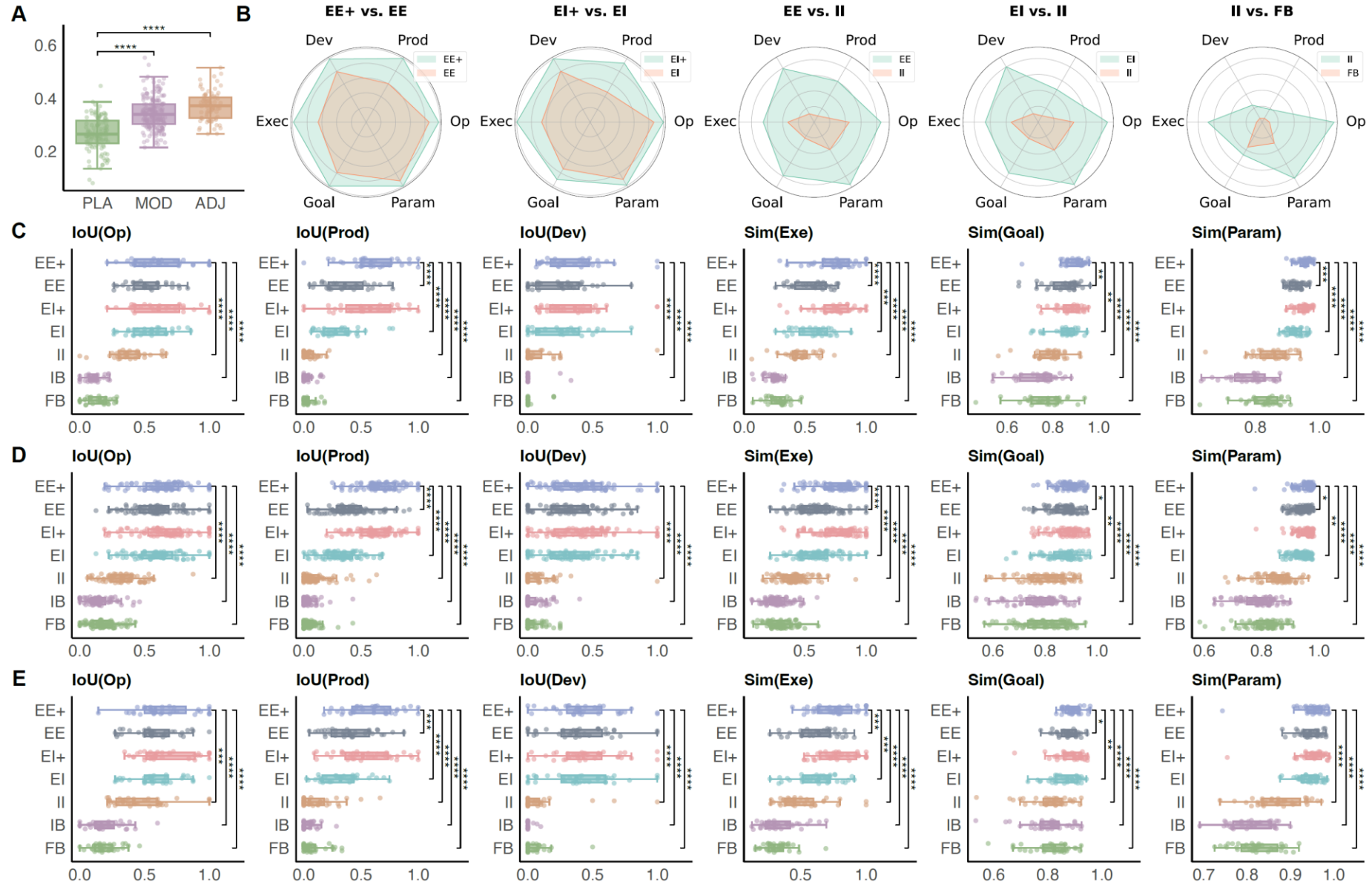


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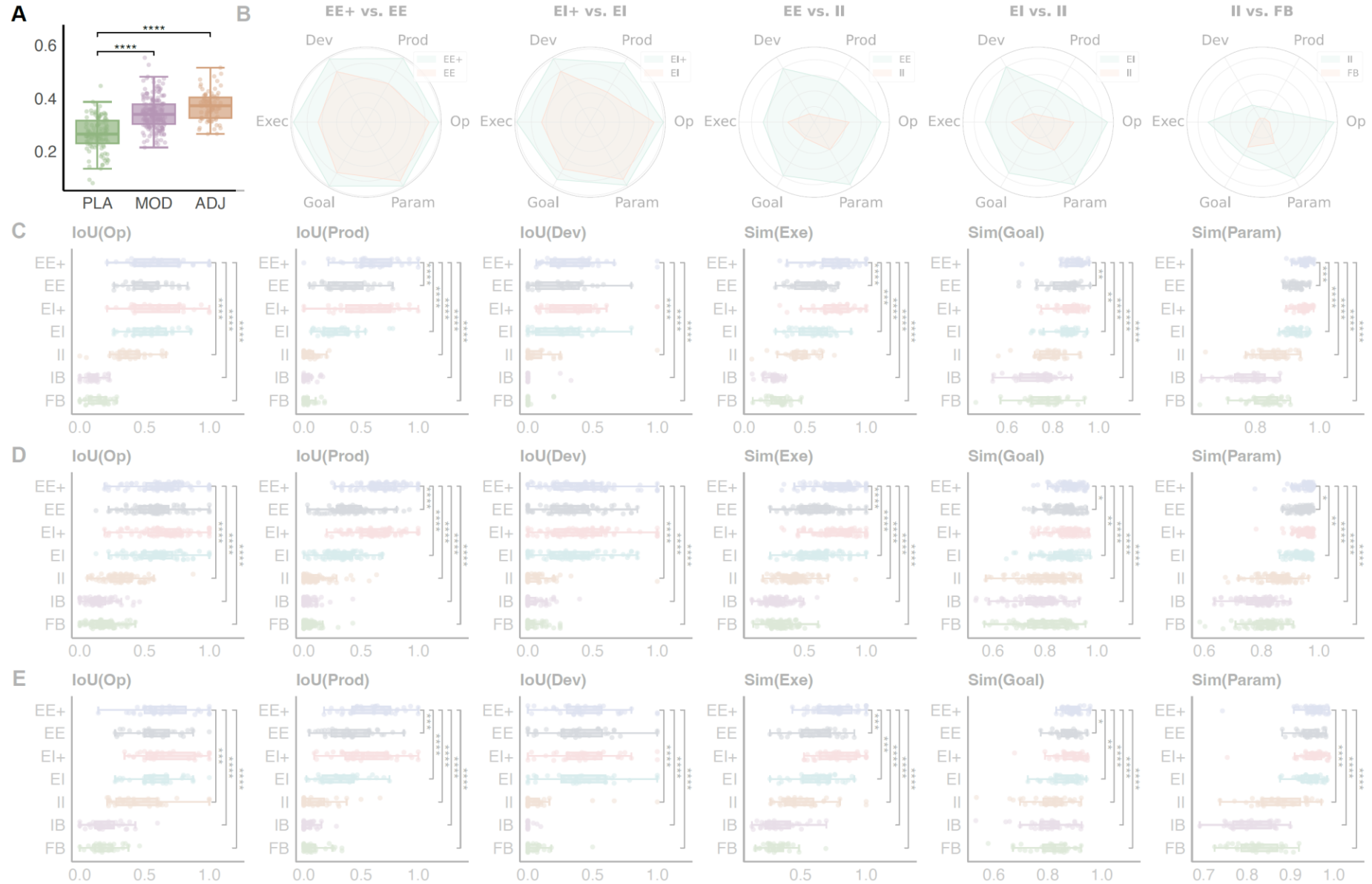




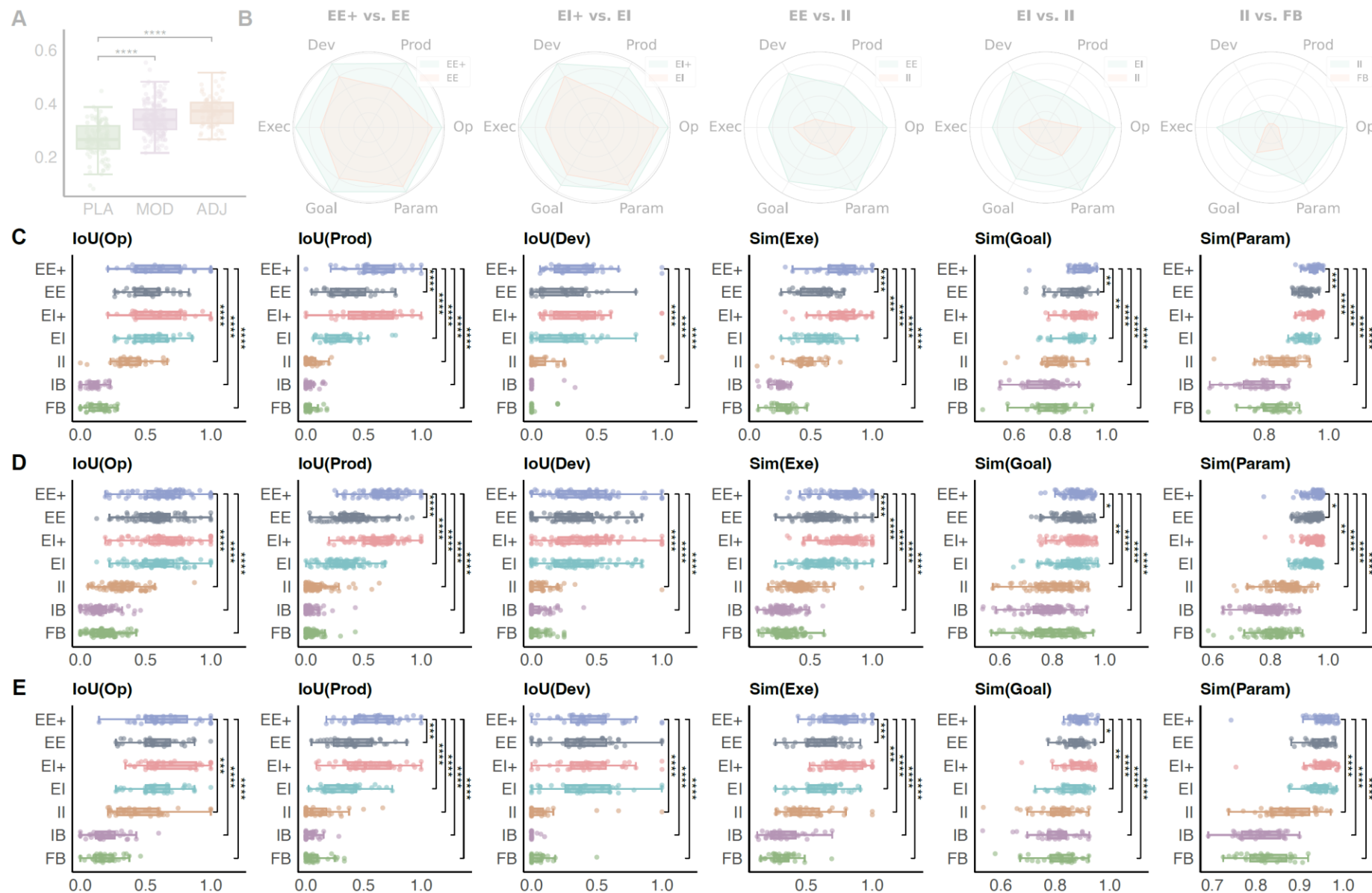
# Results of protocol design



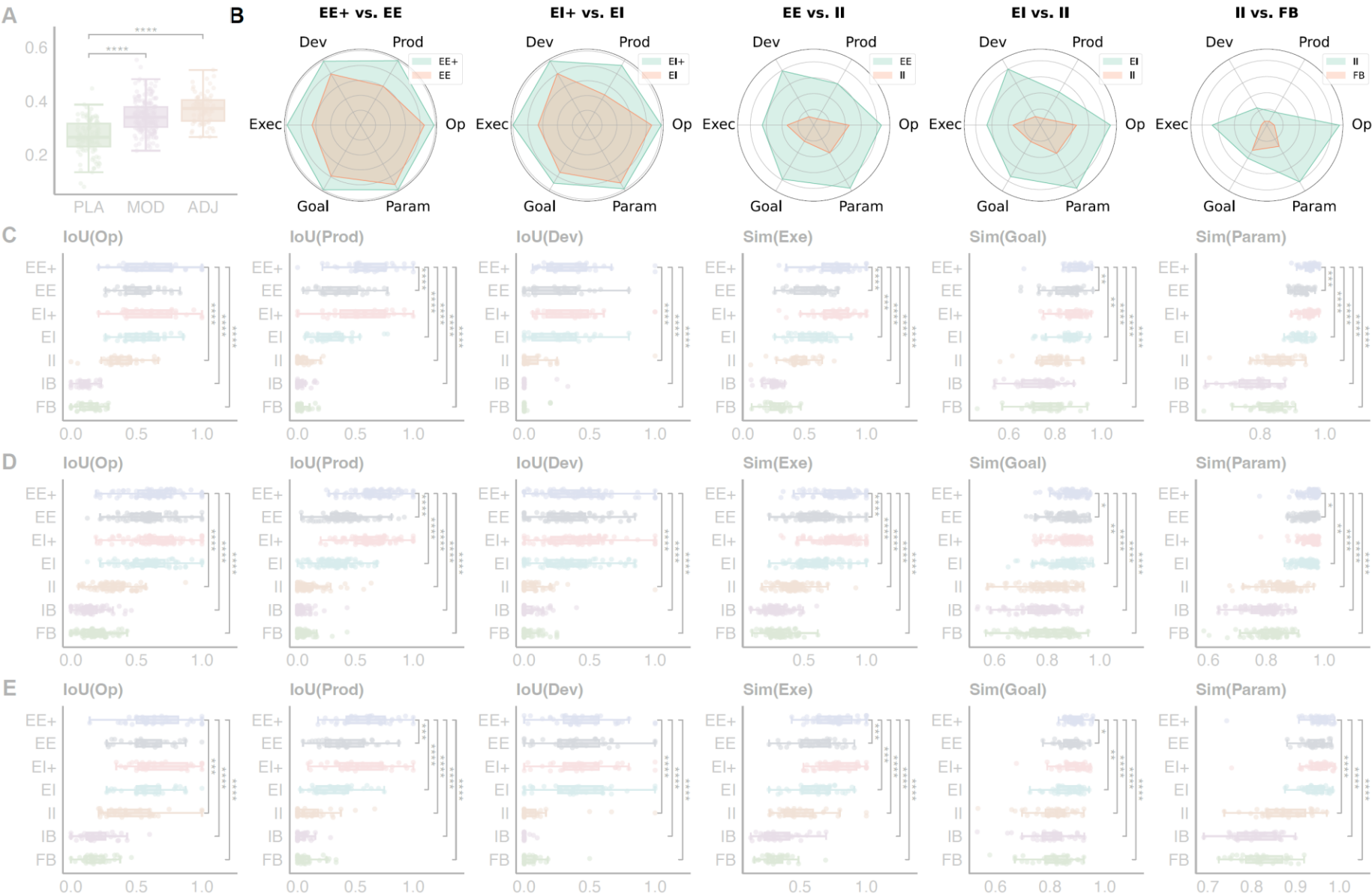
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Our approach possesses the potential to function as an **auxiliary module** for LLMs, enhancing their capability on protocol design.



**Thank you!**