

# Digital Discovery

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## IN THIS ISSUE

ISSN 2635-098X CODEN DDIIAI 3(9) 1651–1912 (2024)



### Cover

See Peyman Z. Moghadam *et al.*, pp. 1662–1681. Image reproduced by permission of Peyman Z. Moghadam from *Digital Discovery*, 2024, **3**, 1662.

## EDITORIAL

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### Introduction to “Accelerate Conference 2022”

Keith A. Brown, Fadwa El Mellouhi and Claudiane Ouellet-Plamondon



## PERSPECTIVES

1662

### Bioprocessing 4.0: a pragmatic review and future perspectives

Kesler Isoko, Joan L. Cordiner, Zoltan Kis and Peyman Z. Moghadam\*



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Elemental answers**

## PERSPECTIVES

1682

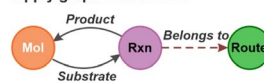
**Chemistry in a graph: modern insights into commercial organic synthesis planning**

Claudio Avila,\* Adam West, Anna C. Vicini, William Waddington, Christopher Brearley, James Clarke and Andrew M. Derrick

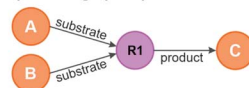
Chemical reaction:



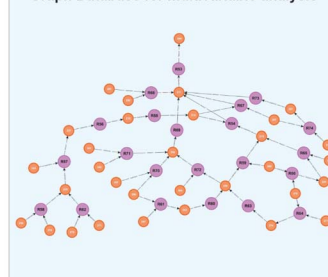
Apply graph data model:



Equivalent graph representation:



Graph Database for multivariable analysis

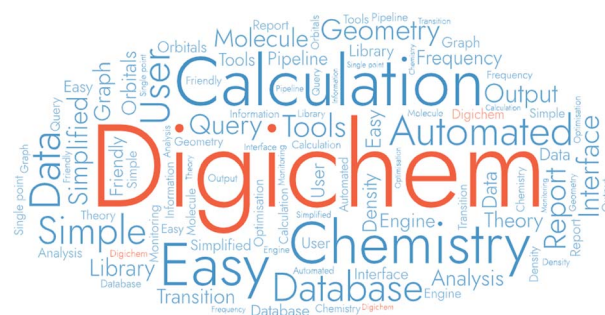


## PAPERS

1695

**Digichem: computational chemistry for everyone**

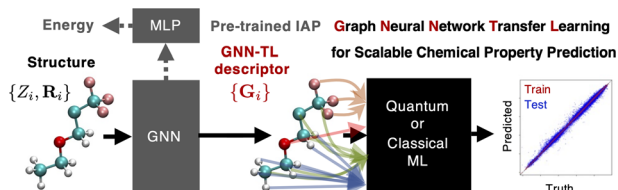
Oliver S. Lee, Malte C. Gather\* and Eli Zysman-Colman\*



1714

**Universal neural network potentials as descriptors: towards scalable chemical property prediction using quantum and classical computers**

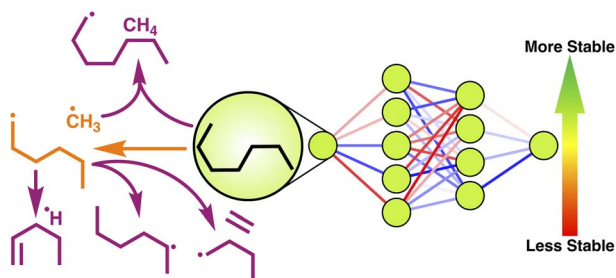
Tomoya Shiota,\* Kenji Ishihara and Wataru Mizukami\*



1729

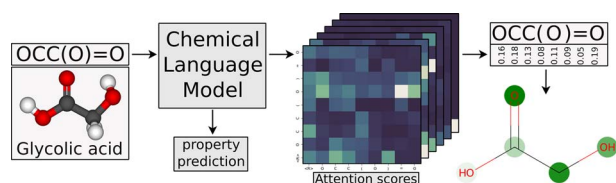
**Machine learning of stability scores from kinetic data**

Veerupaksh Singla, Qiyuan Zhao and Brett M. Savoie\*



## PAPERS

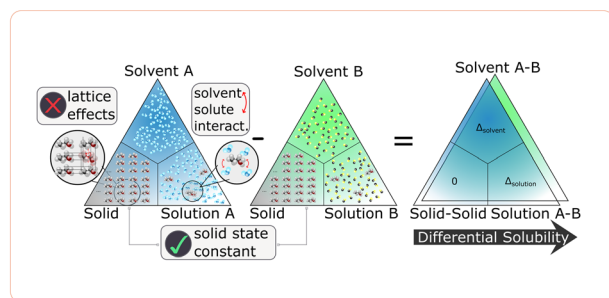
1738



### What can attribution methods show us about chemical language models?

Stefan Hödl, Tal Kachman, Yoram Bachrach, Wilhelm T. S. Huck and William E. Robinson\*

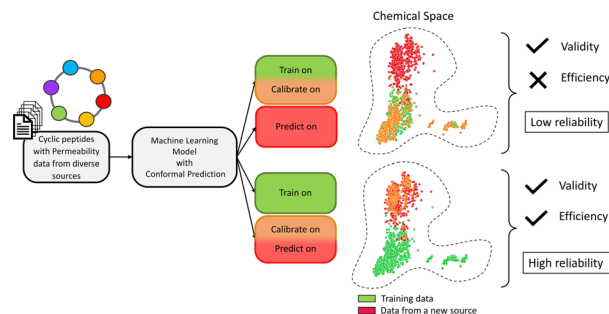
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### Solvmate – a hybrid physical/ML approach to solvent recommendation leveraging a rank-based problem framework

Jan Wollschläger\* and Floriane Montanari

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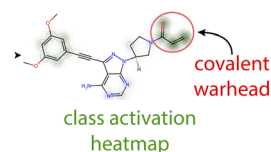


### A methodology to correctly assess the applicability domain of cell membrane permeability predictors for cyclic peptides

Gökçe Geylan,\* Leonardo De Maria, Ola Engkvist, Florian David and Ulf Norinder

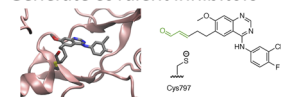
1776

### GNN recognizes protein reactivity of covalent inhibitor futibatinib with 99.2% confidence score

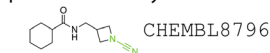


#### Uses:

Generate covalent inhibitors



Screen compound libraries for protein-reactivity



### Graph neural networks for identifying protein-reactive compounds

Victor Hugo Cano Gil and Christopher N. Rowley\*



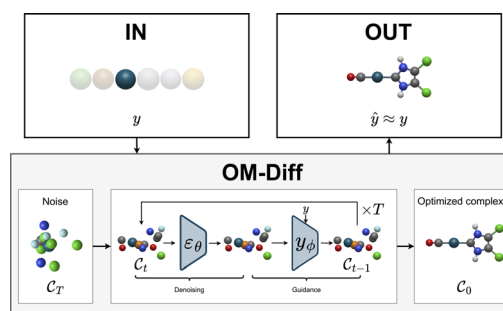


## PAPERS

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**OM-Diff: inverse-design of organometallic catalysts with guided equivariant denoising diffusion**

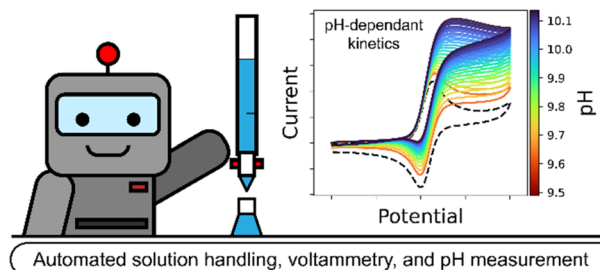
François Cornet, Bardi Benediktsson, Bjarke Hastrup, Mikkel N. Schmidt and Arghya Bhowmik\*



1812

**An automated electrochemistry platform for studying pH-dependent molecular electrocatalysis**

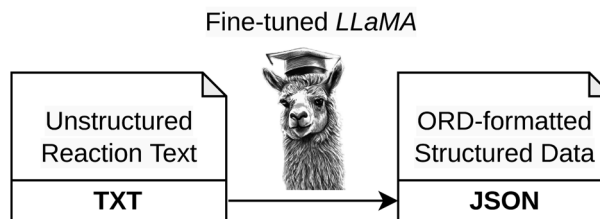
Michael A. Pence, Gavin Hazen and Joaquín Rodríguez-López\*



1822

**Extracting structured data from organic synthesis procedures using a fine-tuned large language model**

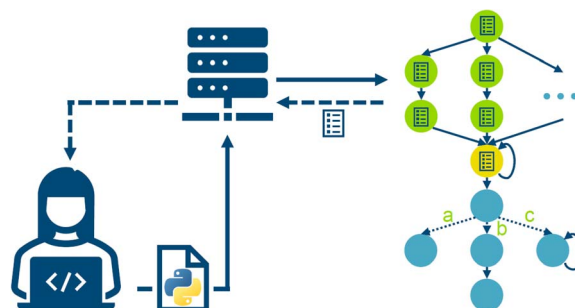
Qianxiang Ai, Fanwang Meng, Jiale Shi, Brenden Pelkie and Connor W. Coley\*



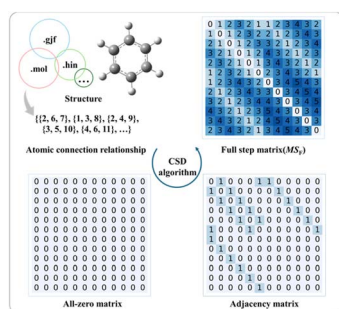
1832

**PerQueue: managing complex and dynamic workflows**

Benjamin Heckscher Sjølin, William Sandholt Hansen, Armando Antonio Morin-Martinez, Martin Hoffmann Petersen, Laura Hannemose Rieger, Tejs Vegge, Juan Maria García-Lastra and Ivano E. Castelli\*



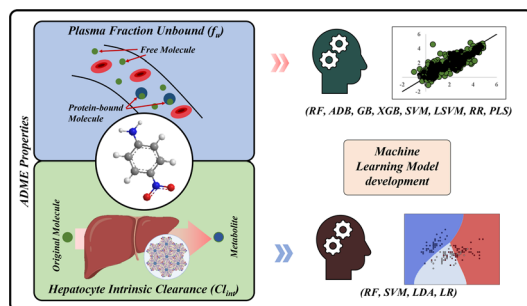
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### Connectivity stepwise derivation (CSD) method: a generic chemical structure information extraction method for the full step matrix

Jialiang Xiong, Xiaojie Feng, Jingxuan Xue, Yueji Wang, Haoren Niu, Yu Gu, Qingzhu Jia, Qiang Wang and Fangyou Yan\*

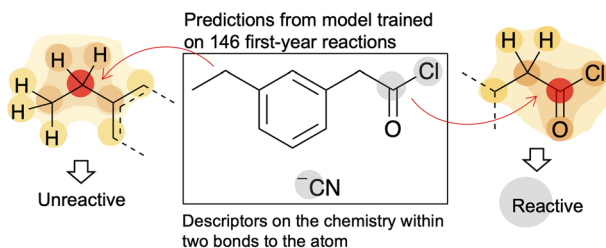
1852



### Insights into pharmacokinetic properties for exposure chemicals: predictive modelling of human plasma fraction unbound ( $f_u$ ) and hepatocyte intrinsic clearance ( $Cl_{int}$ ) data using machine learning

Souvik Pore and Kunal Roy\*

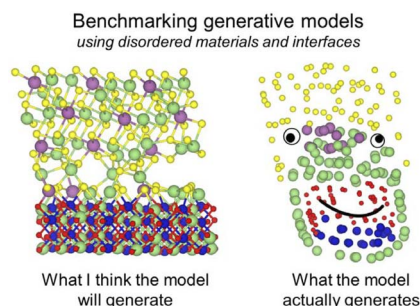
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### Every atom counts: predicting sites of reaction based on chemistry within two bonds

Ching Ching Lam and Jonathan M. Goodman\*

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### Dismat-Bench: benchmarking and designing generative models using disordered materials and interfaces

Adrian Xiao Bin Yong,\* Tianyu Su and Elif Ertekin\*

