U.S. FOOD & DRUG ADMINISTRATION

Screening 55 cannabinoids on 4799 biological targets by *in silico* methods

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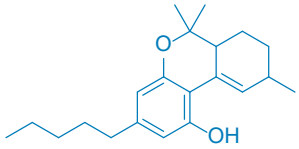
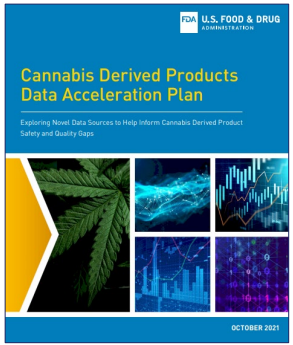
Public health issue and research motivation

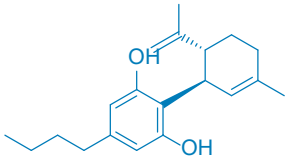
Public health issue

Emerging cannabinoids have unknown safety



Δ10-THC





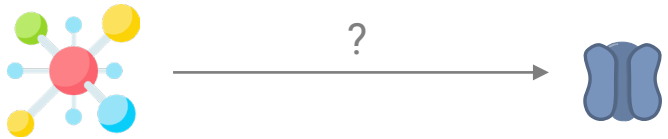
CBDB

etc...

Traditional toxicology methods

(Q)SAR models

(Quantitative) structure-activity relationship models



Features of molecular structure

Biological activity/effects

Rapid, high-throughput, inexpensive approach to screen large numbers of cannabinoids

Methods

Identify cannabinoids

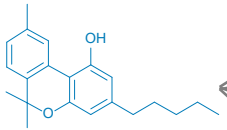
Predict cannabinoid-target binding

Identify adverse effects

CAS SciFinder®

Cayman CHEMICAL

Cannabinoids (55)



Targets (4799)

- Enzymes
- Transporters
- Ion channels
- Receptors

Adverse effects

- Nervous sys. effects
- Cardiac effects
- etc...

Chemotargets CLARITY®

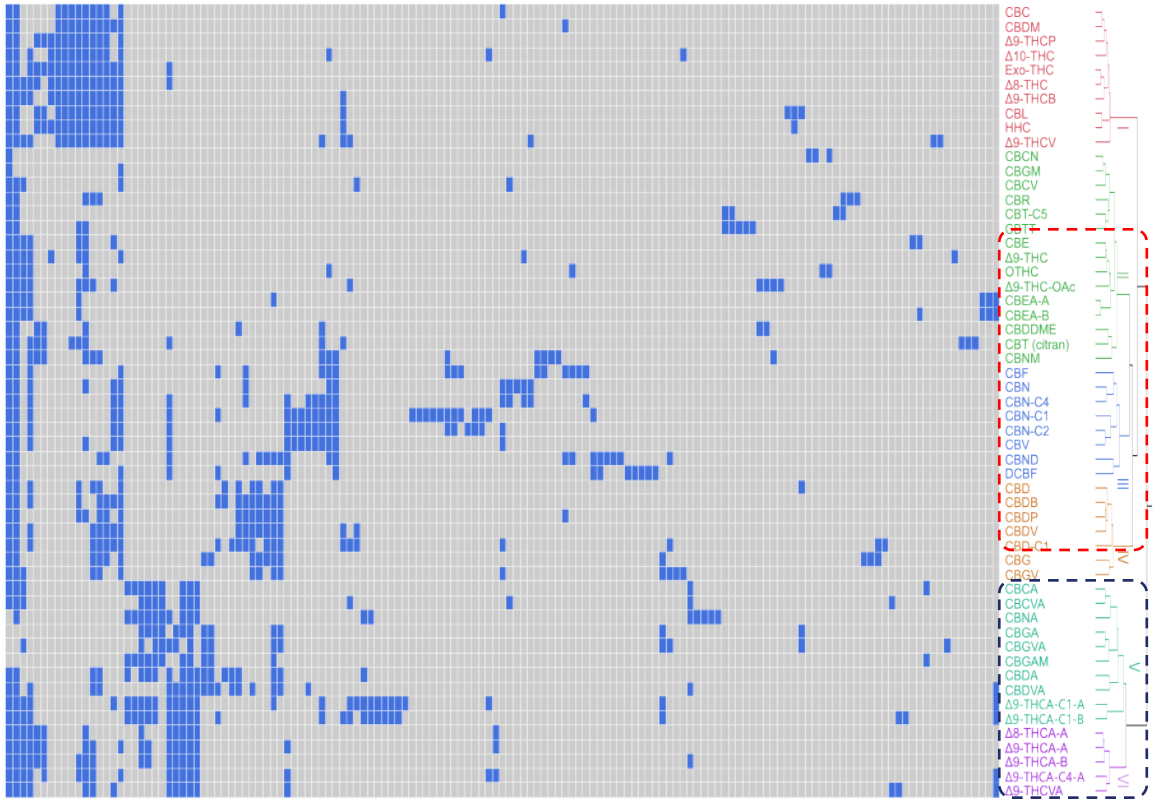
Clarivate™

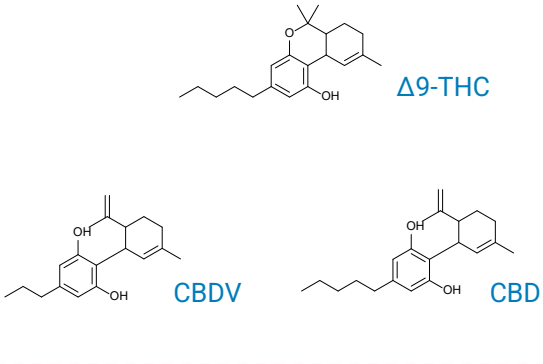
OFF-X The translational safety intelligence portal

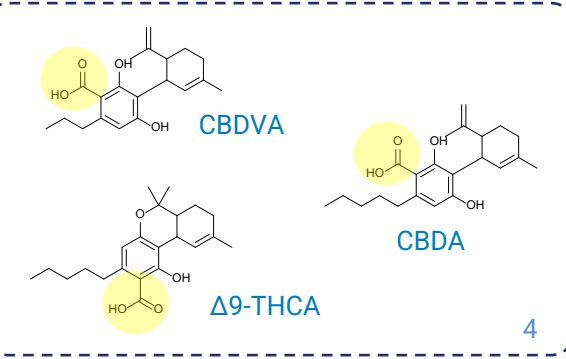
Summary of predictions

Targets (143) →

Cannabinoids (55) ↓







Adverse effects assoc'd with targets

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The translational safety intelligence portal

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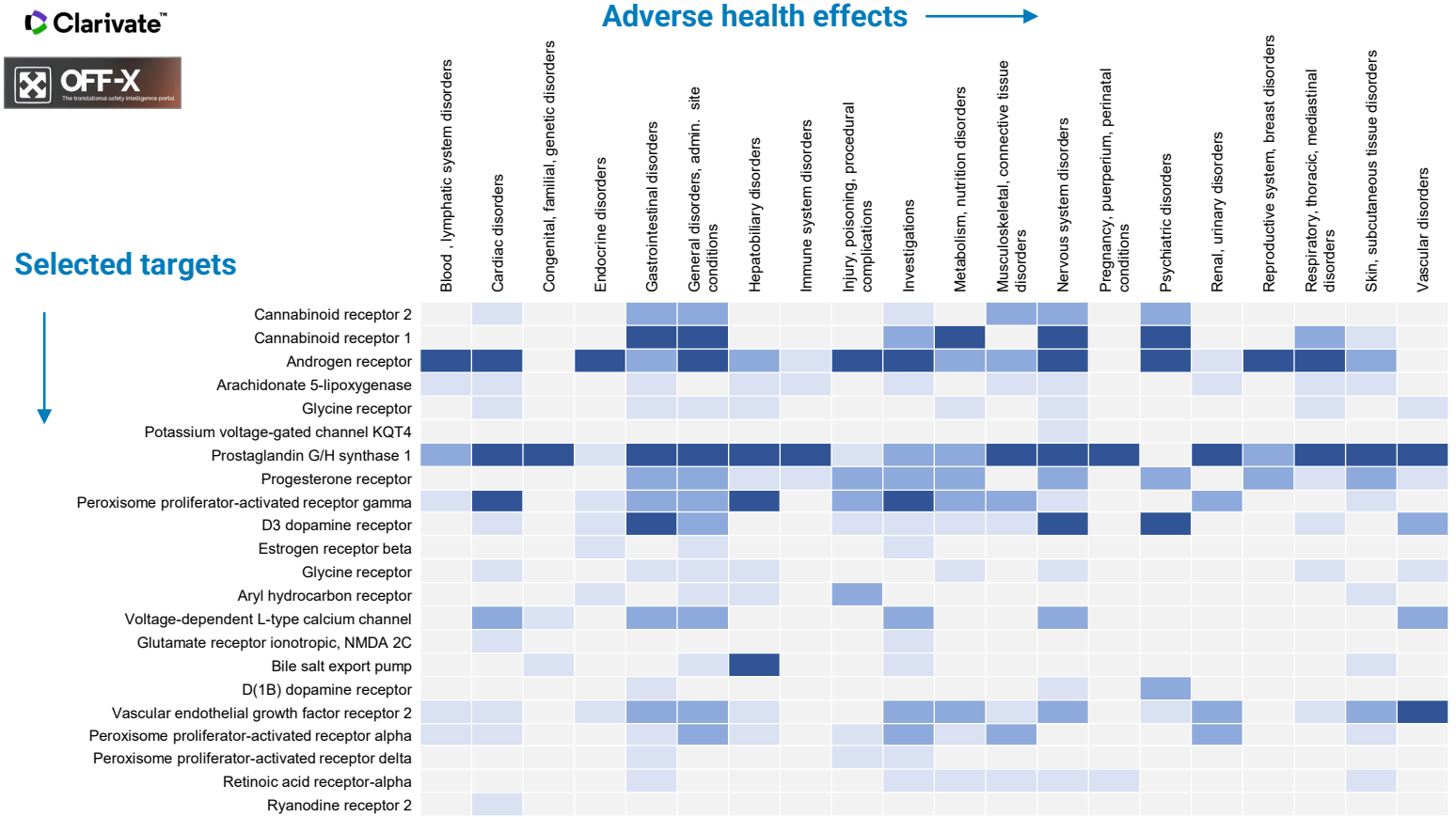
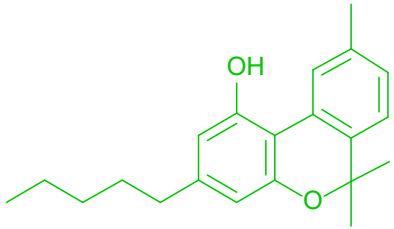


Conclusions and future directions

- *In silico* target screening is a rapid, high-throughput approach for identifying potential adverse health effects and prioritizing subsequent studies
- Models predicted cannabinoids binding to 143 targets associated with gastrointestinal, psychiatric, nervous system, cardiac disorders, et al.
- In the future, target binding will be measured *in vitro* for comparison to predictions
- Predicted target binding does not guarantee adverse health effects will occur (need to consider pharmacokinetics, exposure levels, exposure duration, etc.)



For more information, see MF Santillo and RL Sprando, *Journal of Applied Toxicology*, 2023, https://doi.org/10.1002/jat.4478

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Thank you!

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