

Drug Repurposing with a Drug-Drug Interaction Model

USC Case #2017-150

Market Opportunity:

The drug design process is slow, cumbersome, and prone to many expensive errors. Even in the best case scenarios, pharmaceutical companies bear the burden of high R&D costs due to 90% of potential drugs failing during development. As a result, pharmaceutical companies have begun repositioning (or repurposing) their drugs.

Repositioning generally refers to identifying a drug that the FDA has approved for treating one disease or condition and using that same drug to treat other diseases. Repositioning accelerates development and can lead to reduced costs. Most repositioning approaches, however, are limited because they target a specific disease or specific drug-target relationships. A technique is needed that evaluates all publically available drug information and uncovers new uses for FDA approved drugs.

USC Solution:

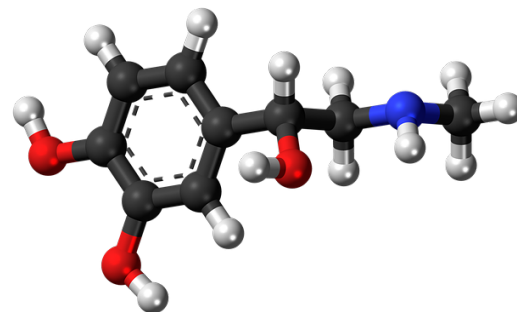
USC researchers have developed a big-data, clustering technique for repositioning drugs. They evaluate all drugs that are available in public drug databases and interpret all possible repositionings at the same time. This method produces fast results because, unlike current techniques, it does not use computationally intensive methods to filter the drug network.

Value Proposition

- Repositions known pharmaceuticals
- Decreases R&D cost
- Interprets all possible repositionings at same time

Keywords:

Clustering, drug-drug interaction network, drug repositioning, pharmacology, big data, personalized medicine



Applications

- Pharmacology
- Drug repositioning
- Personalized medicine

Stage of Development

- Experimentally confirmed
- Available for exclusive and non-exclusive license

Intellectual Property

Status:

Provisional patent filed
US 62/522,486

Key Publications:

[Clustering drug-drug interaction networks with energy model layouts: community analysis and drug repurposing, Nature 2016](#)

Media:

[USC engineer looks at drugs that advance from bench to bedside, USC News 2017](#)

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