Cancer Drug Gene network

CDGnet: Using patient-specific drug-gene networks for recommending targeted cancer therapies

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Targeted cancer therapy assignment

• It is increasingly common to consider individuals’ tumor molecular profiles to recommend therapeutic interventions

• This is often done when a patient has few or no standard treatment options left

• If there are no FDA-approved therapies, a patient may be recommended an off-label therapy

• The goal of CDGnet is to expand the number of possible targeted therapies and prioritize them using drug-gene network approaches
Goal: Prioritize targeted cancer therapies using drug-gene networks

Have an approach that is:

1. Automated
2. Transparent
3. Personalized to individual patients
4. Evidence-based
Therapy prioritization: 4 categories

Category 1: FDA-approved drugs for these alterations in this cancer type, i.e., the alterations represent biomarkers in this cancer type.

Category 2: FDA-approved drugs for these alterations in other cancer types, i.e., the alterations represent biomarkers in other cancer types.

Category 3: Drugs which have as targets the input genes/proteins or as biomarkers/targets other genes/proteins that are downstream of the input oncogenes when considering the pathway corresponding to this tumor type.

Category 4: Drugs which have as biomarkers/targets other genes/proteins that are downstream of input oncogenes when considering the pathways corresponding to other tumor types.

Pathways for specific cancer types: KEGG
Gene-drug connections: DrugBank
Oncogene information: KEGG
Landing page and example user inputs

http://epiviz.cbcb.umd.edu/shiny/CDGnet/
Flow diagram example for category 3 recommendations

http://epiviz.cbcb.umd.edu/shiny/CDGnet/
Collaborations and feedback

• Active collaboration with NDEx team, Timothy Spicer from Scripps (IMAT collaboration through APTRC supplement to R21)

• Please contact me if you are interested in collaborating or giving feedback!

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