drugCARD: a database of anti-cancer treatment regimens and drug combinations

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A database of anti-cancer drugs, combination and regimens

The drugCARD database, accessible through the web, offers data on more than 150 anti-cancer drugs (small molecules and biologics) used in research and in the clinic. It contains information on drug combinations as well as several hundreds of cancer chemotherapy regimens used routinely in the clinic. The data are classified according to tumour type, species and experimental system (in vitro or in vivo). A search engine allows users to perform simple or complex search queries on any term and fields of the database.
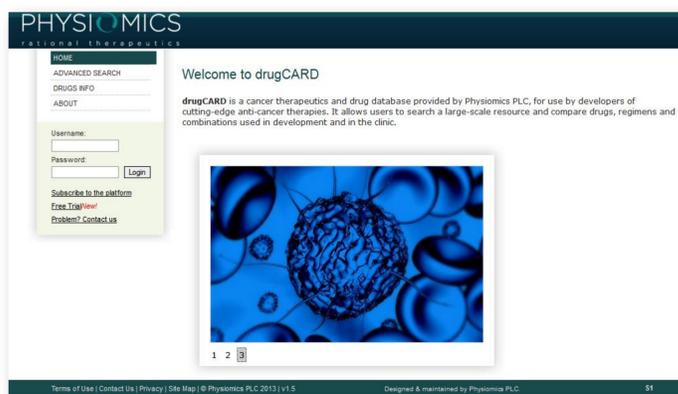

Figure 1. Welcome page of the database.

drugCARD will be available at:

http://www.drug-card.co.uk

Searching drugCARD

Querying the interface is made through a simple text input box. Users can search for:

- drug name
- tumour type
- dosing information
- cell line name
- literature reference

Operators like AND, OR and NOT can be used, as well as wild cards such as * (replaces a chain of many characters) and ? (replaces one character). Furthermore, numerical values (such as dose) can be searched within certain boundaries. For instance "dose:[<100]" will filter those regimens that use a dose lower than 100.
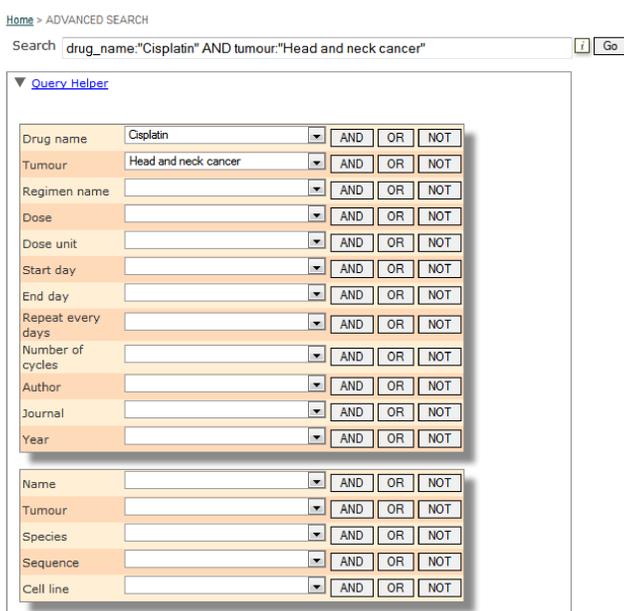An optional graphical query builder assists users with this task.

Figure 2. Query interface and query helper.

Search categories

Two categories of results are currently returned to the user:
- Clinical regimens (Figure 3)
- Combination and sequences (Figure 4)

More than 600 up-to-date clinical regimens are referenced, and   regularly updated. Dosing and precise scheduling are returned in a tabular format. Literature references for each regimen are also provided.
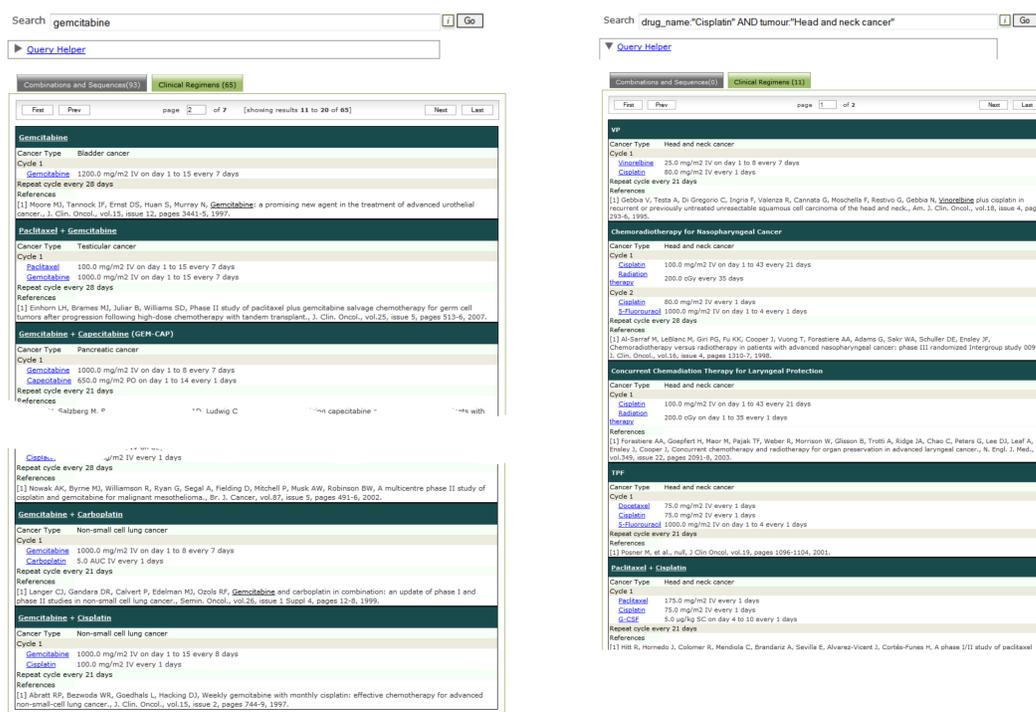

Figure 3. Clinical regimen result examples. Left: simple search for clinical regimens that use Gemcitabine. Right: search for regimens using at least cisplatin in head and neck cancer.

Pre-clinical drug combinations where the level of synergy or antagonism is dependent upon the drug schedule, drug sequence or administration timing are also referenced and annotated. Complex logical queries can also be made to search for antagonistic, additive and synergistic combinations and sequences.
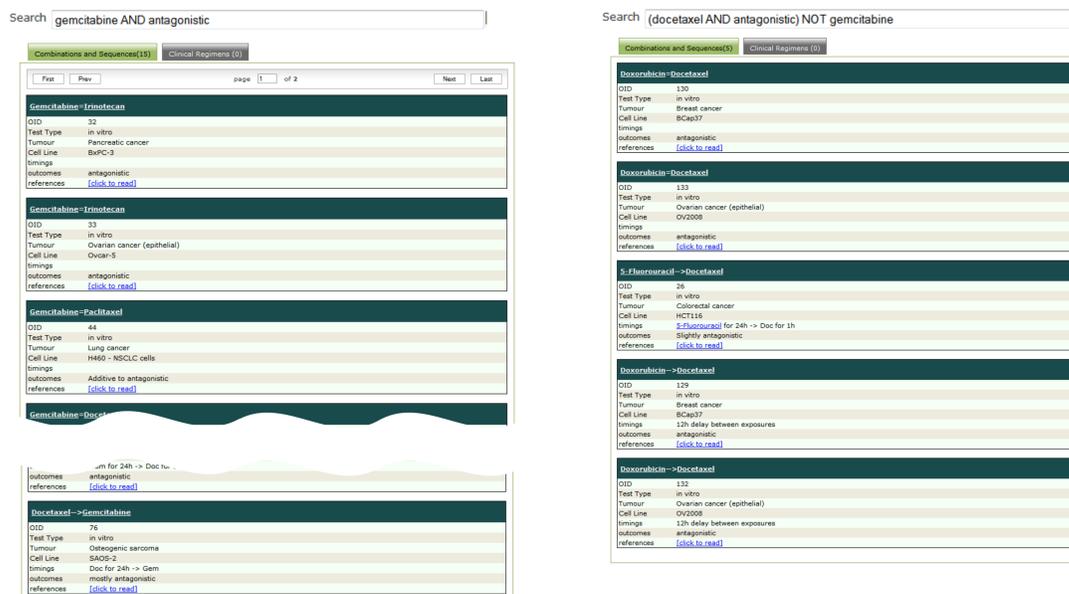

Figure 4. Combination and Sequences examples. Left: search for drug combination and sequences that involve gemcitabine and are known to be antagonistic. Right: search for drug combination and sequences that involve docetaxel but not gemcitabine, and which are known to be antagonistic.

Future developments

The database currently helps users design new combinations and regimens that obey dosing constraints (such as MLD and MTD), and can be used to determine drug candidates that could be combined with a new chemical or biological entity, given the respective mechanisms of action and other PK/PD data. Further data we will include are individual drug information such as pharmacokinetic data, mechanisms of action and resistance, dose-response effect, dosing limits, therapeutic index and immunosuppression data, gathered from partners as well as regulatory submitted documents.

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