queryMed

Linking pharmacological and medical knowledge using semantic Web technologies

https://github.com/yannrivault/queryMed

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Why queryMed?

Analyze Care Pathways
• French Health Insurance data (SNDS)
• Hospital discharge data
• Ambulatory care data
• Cohorte

<table>
<thead>
<tr>
<th>Field</th>
<th>Nomeclature</th>
<th>Number of Codes</th>
</tr>
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<tbody>
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<td>Disease</td>
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<td>&gt;12000</td>
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Patient x
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What is queryMed?

Query biomedical Linked Data

- Ontologies
- Thesauri
- Taxonomies
- Nomenclatures

source: https://lod-cloud.net/
What is queryMed?

Use Web semantic tools

- RDF
- SPARQL

source: Tim Berners-Lee
https://www.w3.org/DesignIssues/LinkedData.html
What is queryMed?

Examine biomedical Linked Data
Retrieve biomedical knowledge

• SPARQL endpoints and REST API
  • DBpedia
  • Ontobee
  • Bioportal
  • SIFR

• Datasets
  • Drug nomenclature (ATC)
  • Drug-Drug interactions (DIKB)
  • Drug-Disease indications (DID)
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Drug-Disease contraindication surveillance

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1003 patients

Drug codes
Diagnosis codes

Patient’s data mapping to NDF-RT nomenclature

find_relations()

1 patient
1 drug-disease contraindication

60 297 couples of contraindications

NDFRT CI with()

Finding contraindications in patient’s data

Medical knowledge retrieval from Ontobee

Ontobee SPARQL endpoint

Drug codes
Diagnosis codes

NDF-RT drugs
NDF-RT diagnoses

Drug-Disease contraindication surveillance

1003 patients

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Finding contraindications in patient’s data

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Drug-Drug contraindication surveillance

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A – Drug
- CLOPIDOGREL
- ASPIRIN
- ACIDE_ACETYLSALICYLIQUE
- OMEPRAZOLE
- LANSOPRAZOLE
- ESOMEPRAZOLE
- RABEPRAZOLE
- REPAGLINIDE
- ALTEPLASE_RECOMBINANTE
- TREPROSTINIL
- PHENINDIONE
- WARFARIN
- ACENOCOUMAROL
- RIVAROXABAN
- APAIXABAN
- DABIGATRAN_ETEXILATE
- DABIGATRAN
- AMIODARONE
- ETRO VIRINE
- PACLITAXEL
- BORTEZOMIB
- ANAGRELIDE
- PHENYTOIN
- FOSPHENYTOIN
- GINKGO_BILOBA
- NICLOSAMIDE

B – Ancestor I
- Platelet aggregation inhibitors excl. heparin
- Enzymes, antithrombotic
- Other blood glucose lowering drugs, excl. insulins in ATC
- Proton pump inhibitors for peptic ulcer and GORD
- Direct thrombin inhibitors
- Direct factor Xa inhibitors
- Vitamin K antagonists
- Antiarrhythmics, class III
- Direct acting antiviral
- Non-nucleoside reverse transcriptase inhibitors
- Taxanes, antineoplastic
- Other anti-dementia drugs in ATC
- Salicylic acid derivative anticestodals
- Other antineoplastic agents in ATC

C – Ancestor II
- ANTITHROMBOTIC AGENTS
- BLOOD GLUCOSE LOWERING DRUGS, EXCL. INSULINS
- ANTIARRHYTHMICS, CLASS I AND III
- DRUGS FOR PEPTIC ULCER AND GASTRO-oesophageal reflux disease
- DIRECT ACTING ANTIVIRALS
- CLOPIDOGREL
- STOMATOLOGICAL PREPARATIONS
- LOIDS AND OTHER NATURAL PRODUCTS, ANTI NEOPLASTIC DRUGS
- OTHER ANTI NEOPLASTIC AGENTS IN ATC
- ANTICESTODALS
- ANTI-DEMENTIA DRUGS
- ANTI-EPILEPTICS

Drug-Drug contraindication surveillance
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query biomedical Linked Data
use Web semantic tools
examine biomedical Linked Data
retrieve biomedical knowledge
your healthcare data
Map and merge
enrich data
decipher care pathways

source:http://digitalhealthage.com