Supporting findability of COVID-19 research with large-scale text mining of scientific publications

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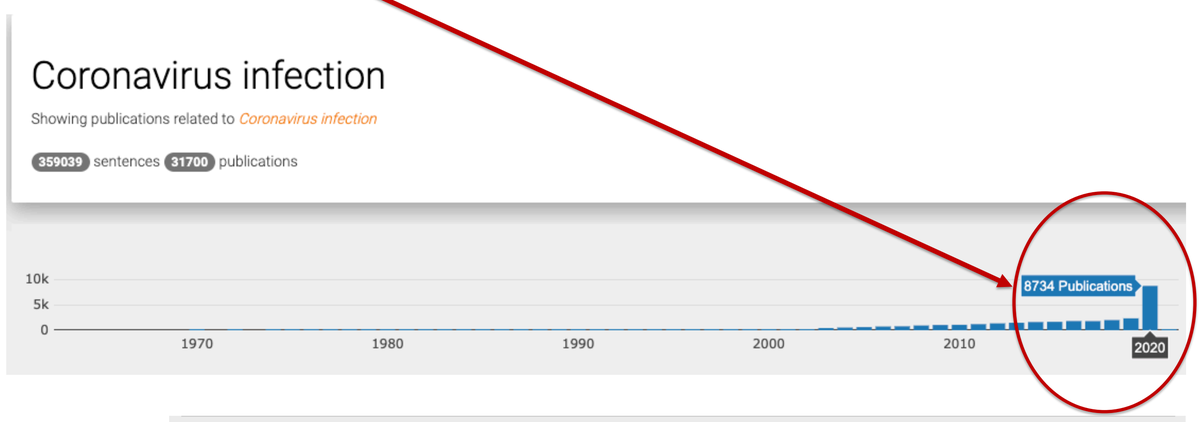
The BioKB platform[1]

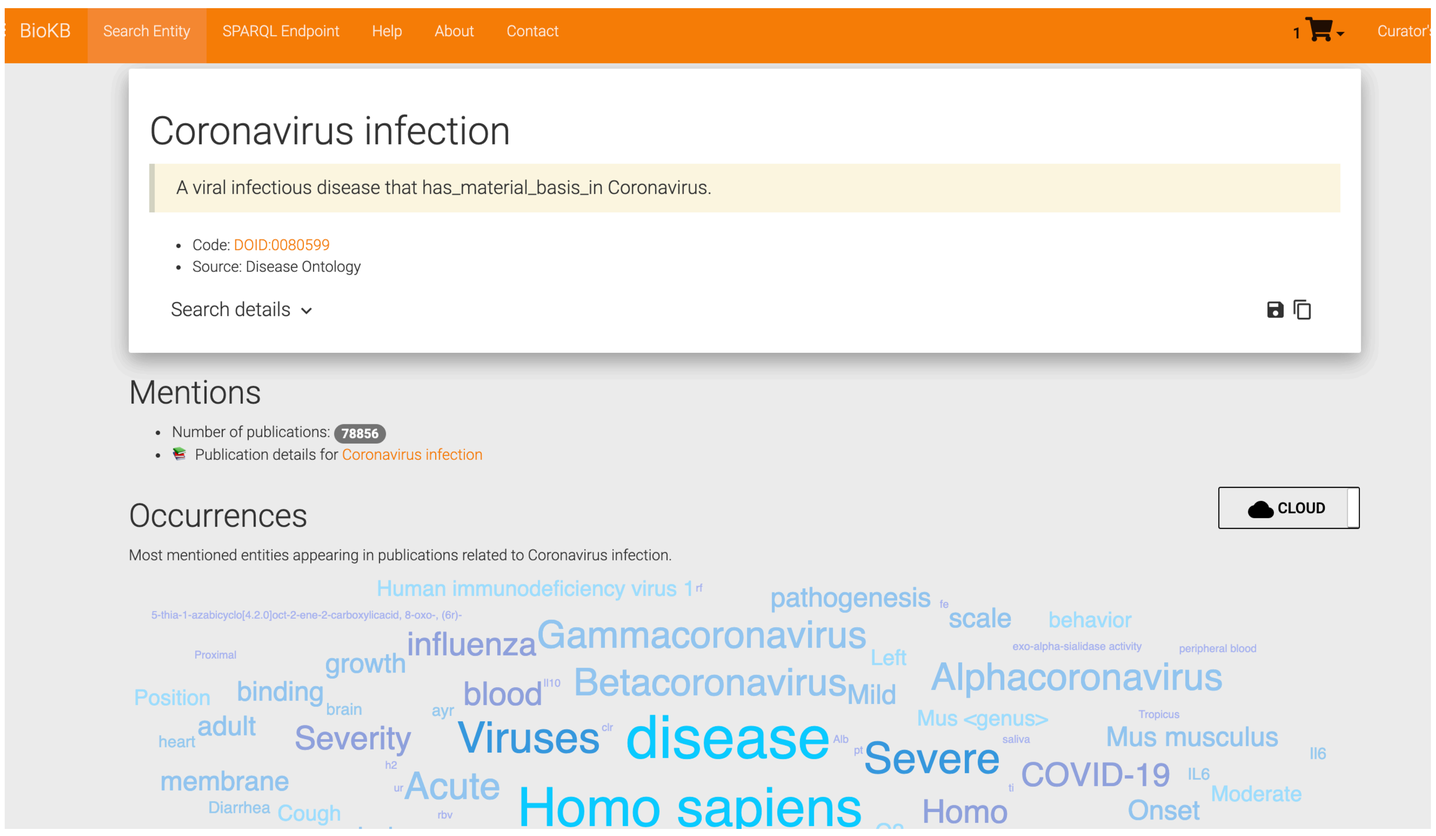
- Exploits text mining and semantic technologies to help researchers easily access semantic content of thousands of abstracts and full text articles
- Concepts from a range of contexts, including proteins, species, chemicals, diseases and biological processes are tagged based on existing dictionaries of controlled terms
- Co-occurring concepts are classified based on their asserted relationship and the resulting subject-relation-object triples are stored in a publicly accessible human- and machine-readable knowledgebase
- All concepts in the BioKB dictionaries linked to stable, persistent identifiers
  - ➢ Resource accession such as an Ensembl[2], Uniprot[3] or PubChem[4] ID for genes, proteins and chemicals
  - ➢ Ontology term ID for diseases, phenotypes and other ontology terms

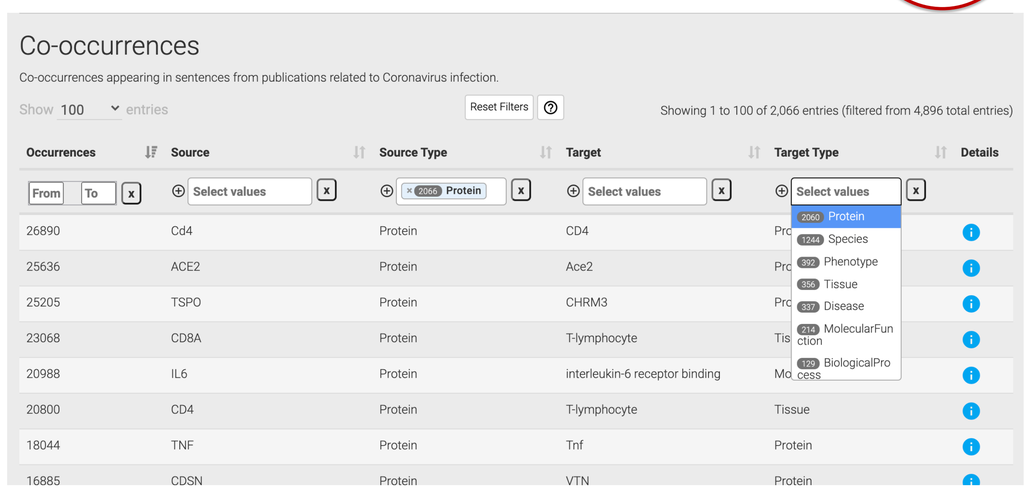
https://biokb.lcsb.uni.lu/

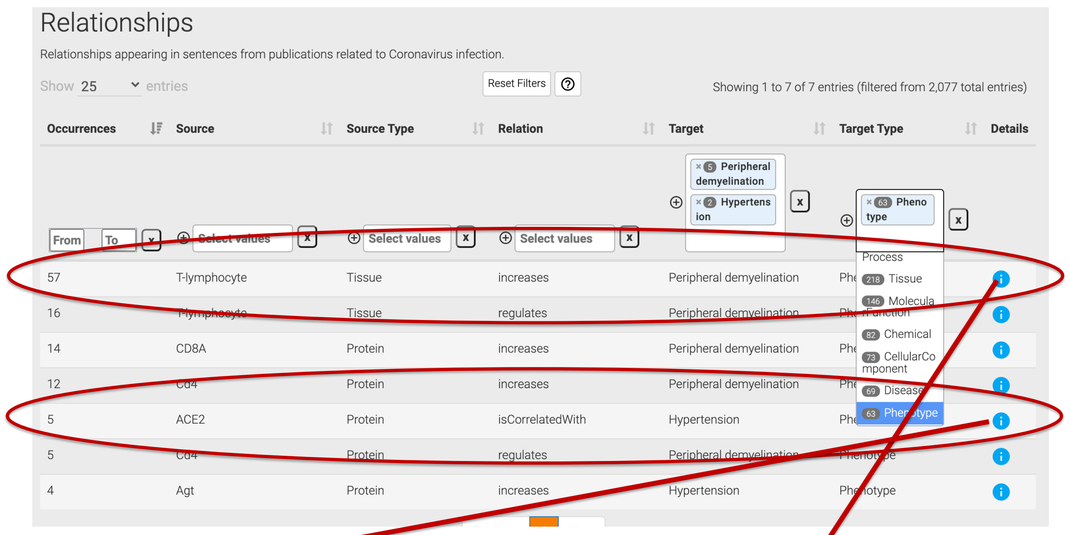
Background

- COVID-19 pandemic – lots of research efforts quickly redirected towards studies on SARS-CoV2 and COVID-19 disease
  - ➢ Sequencing and assembly of viral genomes
  - ➢ Elaboration of robust testing methodologies
  - ➢ Development of treatment and vaccination strategies
- Flurry of scientific publications around SARS-CoV-2 and COVID-19
  - ➢ Increasingly difficult for researchers to stay up-to-date with latest trends and developments in this rapidly evolving field





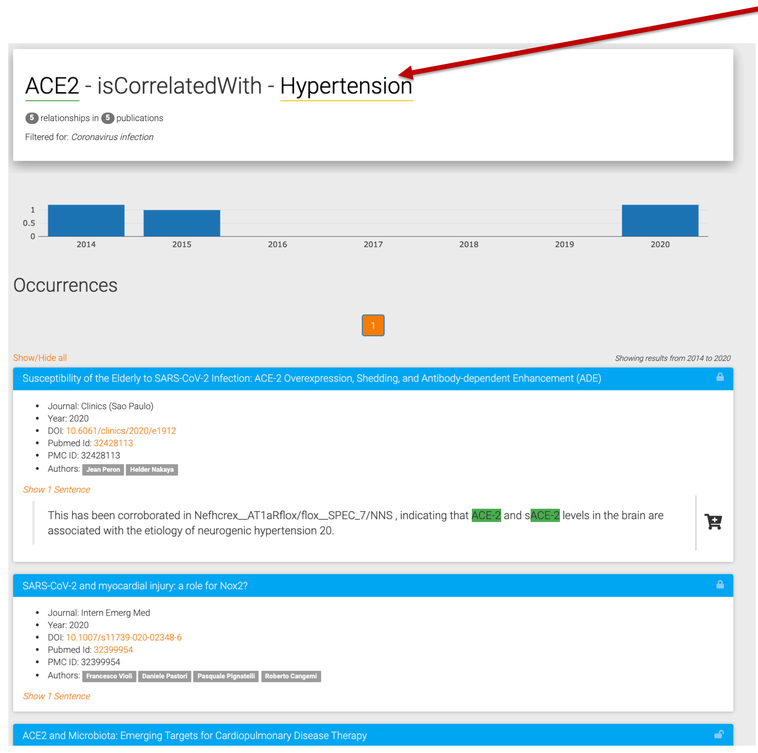


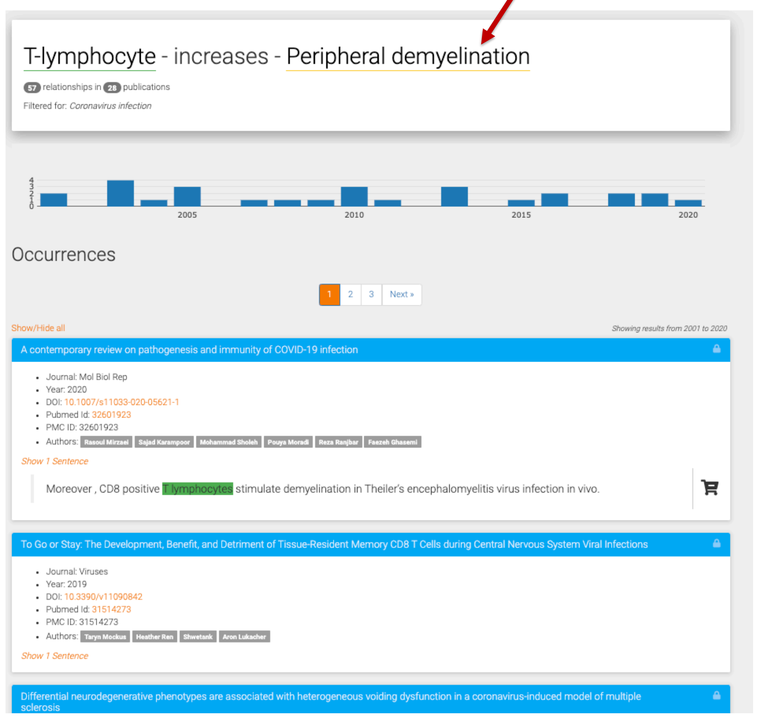


COVID-related platform improvements

Extension of the underlying dictionaries to increase the sensitivity of the text mining pipeline to viral data, including

- ➢ Additional viral species (via NCBI Taxonomy[5] identifiers)
- ➢ Phenotypes from the Human Phenotype Ontology[6] (HPO)
- ➢ COVID-related concepts including clinical and laboratory tests from the COVID-19 ontology[7]
- ➢ Additional diseases (DO[8])
- ➢ Biological processes (GO[9])
- ➢ All viral proteins found in UniProt and gene entries from EntrezGene[10]





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