

Elucidating drug-drug interactions underlying drug polypharmacy profiles

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ABSTRACT

Medications represent the most common intervention in health care, despite their benefits; they also lead to an estimated 1.5 million adverse drug events and tens of thousands of hospital admissions each year. Although most are not preventable given what is known today, many types are, and one key cause is drug-drug interactions (DDIs)[1] that may be followed by adverse drug reactions. Often, these noxious and unintended responses go unnoticed during the preclinical and clinical trial phases of a drug. Our research makes use of available clinical and phenotypic data which covers a cohort of persons treated in the hospitals of the Capital and Sealand Regions in the years 2006-2016, and will analyse it with the aim of finding out potential biological functions in which drug interactions are involved by using different clustering algorithms and topological network analyses.

This first phase of the internship is related to gain knowledge about the field I am doing my research and to the extraction of data (DDIs) from the different public resources available. This means We are currently recollecting and tidying the data so as to use it for the next phase of the project. This data extraction consists of downloading pharmacological documents/databases like pharmacovigilance (Drugbank, KEGG, and TWOSIDES), clinically-oriented information sources (NDF-RT), and NLP Corpora ones (DDI corpus 2013) that contains DDIs, from different sources via its website or REST API. Once extracted, we link those drugs with its ATC codes or RXnorm-Ids so as to have a common identifier for each kind of drug resource. We also perform some basic statistics and plots on the datasets in order to have a better idea of the contents of them. For this phase, python scripts for extracting and SQL programming for visualizing have been used, but it has mainly been R the language used to proceed with this operations.

References

1. David C. Classen, M. . S. P. R. P. , MD & David W. Bates, M., MD. Critical drug-drug interactions for use in electronic health records systems with computerized physician order entry: Review of leading approaches. *figshare* <https://insights.ovid.com/crossref?an=01209203-201106000-00001> (2011).