

Clustering therapeutic drugs using FDA Adverse Event Reporting System

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Therapeutic drugs have been classified based on pharmacodynamics and disease indications. However, it has gradually been revealed that profiling of side effects can be used to classify therapeutic drugs and to find novel disease indications of drugs. In this study, we generated multidimensional vectors for each therapeutic drug based on the cosine similarity of indications or side effects in the US FDA Adverse Event Reporting System (FAERS). Using the spatial density, the multidimensional vectors were clustered based on the indications and side effects in FAERS. By comparing these clusters, we were able to identify several sets of therapeutic drugs that were common in the two clusterings, including a few sets comprising of therapeutic drugs with different pharmacodynamics and different disease indications. These findings suggest that clustering therapeutic drugs based on similarities of indications and side effects reported in public databases can be useful to find new functions of therapeutic drugs.