Personalized Prediction of Adverse Side-effects of Drugs and Vaccines

Corrected % of adverse side-effects risks for drugs or vaccines based on algorithm leveraging the recipient's characteristics and history

Request an introduction

Reference: IDF 07-21

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IP Status

Provisional patent, Patent application submitted

Seeking

Licensing

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Background

Adverse Side-effects (ASE) for drugs or vaccines are a common occurence. The risks of ASE described in the indication of drugs or vaccines is based on what was observed during clinical trials with a wide range of patients. However these risks can drastically increase depending on the patient history and characteristics. Our algorithm leverages these data to allow personalized ASE prediction.

Tech Overview

The algorithm is based on input parameters including personal and medical characteristics of patients and gives refined and quantitative risks for a variety of side-effects including both severe and non-severe reactions. The algorithm has successfully been applied so far to:

- COVID vaccines: Pfizer, Moderna, AstraZeneca, Sputnik V and Sinopharm
- Other vaccines: pneumococcal vaccine (Prevnar13), a flu vaccine (Fluarix), and a zoster vaccine (Shingrix).
- Drugs: Revlimid and Avastin

Tables prediction ASE of COVID vaccines and Revlimid

Other drugs are subject to ongoing model developments.

Stage of Development

TRL7 (algorithm can readily be used, although performance would benefit from training on bigger datasets)

Benefits

- Accurate % risks of adverse side-effects

Applications

- Guidance on the most appropriate and safest treatment according to a patient characteristic and history (or personalized medecine based on the safety of drugs and risk of ASE)
- Planning prophylactic measure to alleviate expected ASE (Personalization of risk management planning for individual patients)
- Refining ASE indications for patients with certain conditions, characteristic or history
- Patient education though personalized factsheets

Opportunity

PACTT offers to grant exclusive or non-exclusive license to industrial partners able to develop and commercialize the technology.

Appendix 1

Tables prediction ASE of COVID vaccines and Revlimid

Table for predicted ASE of COVID vaccines:

ASE	Efficiency of predictions - AUC-ROC
Fever	0.68
Fatigue	0.67
Headache	0.67
Nausea	0.70
Chills	0.68
Joint Pain	0.64
Muscle Pain	0.63
Local Side effects	0.71

Table for predicted ASE of Revlimid*:

ASE	Efficiency of predictions - AUC-ROC
Balance discorder	0.73
Joint swelling	0.71
Acute kidney injury	0.67
Palpitations	0.67
Weight decreased	0.67
Arthralgia	0.66
Neutropenia	0.66
Sepsis	0.66

*There were over 100 different side effects that are predictable through our strategy, and these eight are a sample of them.

Learn more about this opportunity

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