# 開發計算毒理學方法預測皮膚致敏性物質

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## Skin sensitization as an important toxicological endpoint for chemical safety assessment that has been traditionally evaluated using rodent assays. Recently, the development of alternative assays based on adverse outcome pathway (AOP) shows potential for replacing animal-based testing. A few integrated strategies have been proposed to predict rodent and human data by integrating multiple assays associated with key events in the AOP. Although improvement in prediction performance has been reported by previous studies, the evaluation is based on only limited data collected from a few studies. The generalization ability of the proposed strategies remains unclear. A systematic analysis of the robustness of previous strategies using a large dataset of alternative assays could help to build better models. In this study, a large dataset was extracted from our curated database SkinSensDB for skin sensitization assays (http://cwtung.kmu.edu.tw/skinsensdb). There are 741 unique chemicals associated with 4928 assay results curated in SkinSensDB. Only chemicals with in vivo outcomes (including rodent and human data) and complete data of three classes of alternative assays corresponding to peptide reactivity, keratinocyte activation and activation of dendritic cells were analyzed. Two machine learning-based models for predicting human and rodent outcomes were constructed based on the experimental results of the three classes of alternative assays. Our results showed that interlaboratory variation exists and the proposed models based on a large dataset could be more robust. The prediction models are expected to be useful for computational identification of skin sensitizers and will be further developed and integrated into our SkinSensDB.