Web Application to Predict Skin Sensitization Using Defined Approaches

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Defined approaches for skin sensitization (DASS) have been developed to identify potential chemical skin sensitizers by integrating data from multiple non-animal tests using data interpretation procedures. While certain DASS have been internationally accepted by regulatory agencies, the data interpretation procedures they use vary in logical complexity, and manual application can be time-consuming and error prone. We developed an open-source web application, the DASS App, to facilitate programmatic implementation of four DASS: the Two-out-of-Three (2o3), two versions of the Integrated Testing Strategy (ITS), and the Key Event 3/1 Sequential Testing Strategy (KE 3/1 STS). To predict skin sensitization hazard, the 2o3 is based on consensus among three tests; ITSv1 and ITSv2 implement a scoring scheme using three tests; and the KE 3/1 STS is based on a stepwise evaluation with two tests. ITS can also be used to predict potency categorization using criteria from the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The DASS App enables users to implement non-animal approaches to evaluate chemical skin sensitization without the need for additional software or computational expertise. The application supports upload and analysis of user-provided data and provides hazard and potency predictions in a downloadable format. The latest update introduced the ability to evaluate DASS predictions against user-supplied reference data. The DASS App is available online at https://ntp.niehs.nih.gov/go/40498. This project was funded with federal funds from the NIEHS, NIH under Contract No. HHSN273201500010C.