

Confirming known respiratory sensitizers with reliable evidence

Establishing a Gold Standard list of respiratory sensitizers

PRESENTER: **Nikaeta Sadekar**

INTRODUCTION

The induction of immunological responses in the respiratory tract due to previous exposure of a compound is known as respiratory sensitization, and the compound is known as a respiratory sensitizer. The evidence is primarily found in humans from occupational inhalation exposures and is limited by the scope of a retrospective epidemiological study. In addition to the limited data, the complexity of the respiratory system makes it difficult to replicate this process in an animal or a cell culture model. Therefore, to understand respiratory sensitization, it is important to identify and confirm the respiratory sensitizers, and this can be accomplished by a careful review of the clinical reports. Therefore, the objective is to categorize and confirm the known respiratory sensitizers based on reliable, weak, and questionable evidence in their clinical reports. Next steps include selection of confirmed respiratory sensitizers as the 'Gold Standard' or reference list.

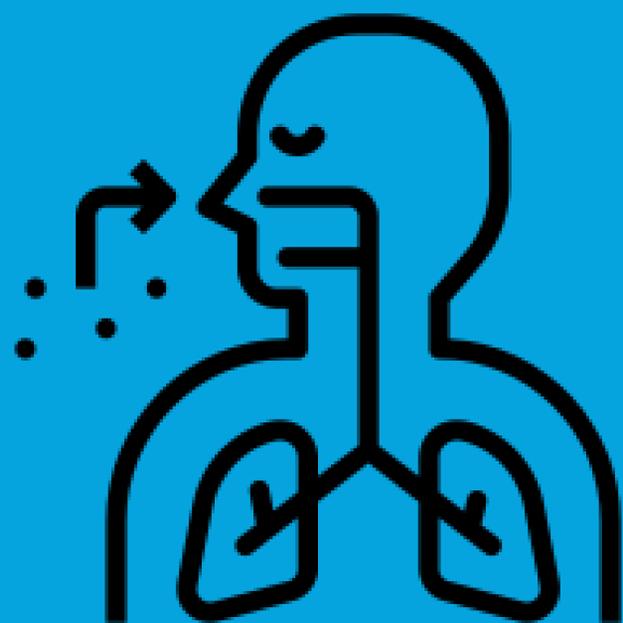
METHODS



References

- http://ec.europa.eu/health/scientific_committees/docs/annex6_respiratory.pdf
- J. Jarvis, M. J. Seed, S. J. Stocks, R. M. Agius; A refined QSAR model for prediction of chemical asthma hazard. *Occupational Medicine*, Volume 65, Issue 8, 1 November 2015, Pages 659–666 <https://doi.org/10.1093/occmed/kqv105>
- Sander Dik, Emiel Rorije, Paul Schwillens, Henk van Loveren, Janine Ezendam; Can the Direct Peptide Reactivity Assay Be Used for the Identification of Respiratory Sensitization Potential of Chemicals?, *Toxicological Sciences*, Volume 153, Issue 2, 1 October 2016, Pages 361–371 <https://doi.org/10.1093/toxsci/kfw130>
- UK HSE., *Asthma? Critical assessments of the evidence for agents implicated in occupational asthma* UK Health and Safety Executive, 2001.

Confirming known respiratory sensitizers is the first step to understanding respiratory sensitization.



Take a picture for author contact information

RESULTS

*Respiratory Sensitizers With Reliable Evidence	
2-hydroxyethyl Methacrylate	Lanasol Yellow
Alpha Amylase	Lauryl Dimethyl Benzyl Ammonium Chloride
Azodicarbonamide	Maleic Anhydride
Benzyl N-butyl Phthalate	Methyl Cyanoacrylates
Benzyl dimethyldodecyl Ammonium Chloride	Methyl Methacrylate
Bromelains	Naphthalene Diisocyanate
Carmine	Ninhydrin
Chloramine T	Penicillin
Di(2-ethylhexyl)phthalate (DEHP)	Phthalic Anhydride
Diphenylmethane Diisocyanate	Piperazine
EPO60 Polymerize Vinyl Chloride	Piperazine Dihydrochloride
Ethylene Diamine	Polyethylene
Ethylene Oxide	Polyfunctional Aziridine
Ethyleneimine	Polyvinyl Chloride
Glutaraldehyde	Sodium Isononoyl Oxybenzene Sulfonate
Hexachlorophene	Styrene
Hexahydrophthalic Acid Anhydride	Tetrachlorophthalic Anhydride
Hexamethylene Diisocyanate	Toluene Diisocyanate
Himic Anhydride	Triethanolamine
Hydroxylamine	Triethylene Tetramine
Isononoyl Oxybenzene Sulfonate	Triglycidyl Isocyanurate
Isophorone Diamine	Urea Formaldehyde
Isothiazolinones	

* Excluding heavy metals

Criteria for categorization as reliable evidence

- Exposure evidence related requirements
 - Confirmed report with "confirmation" in the form of documented exposure (direct measurements of some type have been performed, there is a single type of chemical handled or processed by the exposed individual(s), or there is documentation or knowledge of a direct exposure), follow-up testing of the individual or the exposure location, OR
 - Group of individuals in a common location experiencing the same respiratory symptoms with clear exposure primarily to the substance in question (may be in a mixture or other substances in occupational setting might be present, but the documented scenario contains some reason to believe that the exposure was predominately to the substance in question), AND
 - Reaction should occur within a reasonable duration following exposure, or should occur upon re-challenge with offending substance
- Any information documenting confirmation of reaction in a medical setting qualifies to support a score of "1" including such tests as patch tests, skin prick tests, or other forms of medically supervised re-challenge and observations (e.g., IgE levels by ELISA, etc).
- Can be accompanied by dermal sensitization, or can be respiratory alone
- Data/observations should be collected by a qualified or authoritative source, and are not anecdotal in nature, but observational

Nikaeta Sadekar, Ph.D. and Anne Marie Api, Ph.D.

Acknowledgement: We would like to thank the Exponent teams for their tremendous help in reviewing the data.

