Drug repurposing for chemical agent exposure

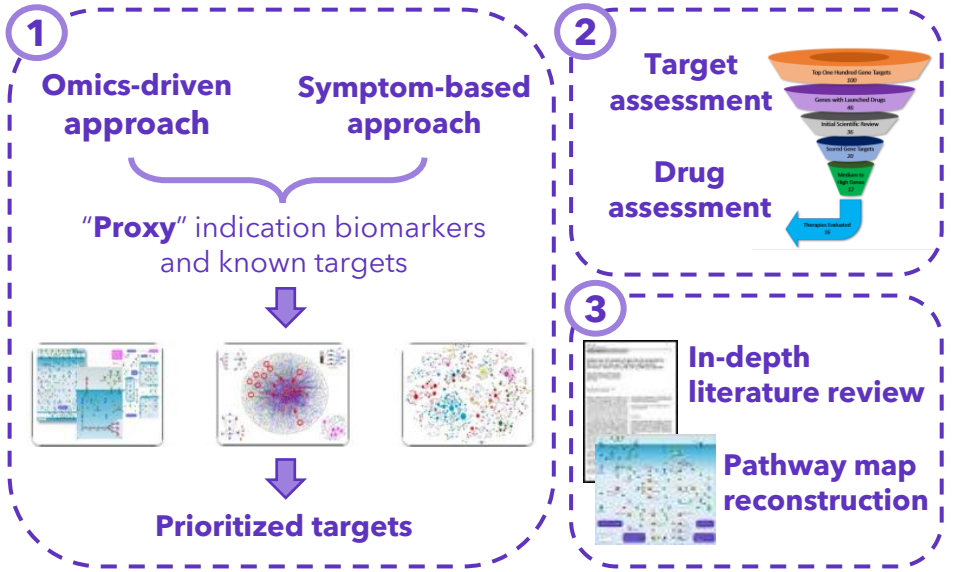
Target identification & Drug repositioning

Client Background and Objectives:

- HHS Biomedical Advanced Research and Development Authority (BARDA)
- Client wanted to identify commonly available drugs that are easily obtained from hospitals, pharmacies, and the community, to be used as Medical Countermeasures (MCMs) in chemical exposure situations

Key Business Questions:

- What are common molecular mechanisms of response to chemical exposure?
- What approved and late-stage drugs are suitable and available for rapid deployment against toxic chemical exposure?



Solution

- **Target identification and prioritization** (1): Using Clarivate proprietary knowledge graph spanning Cortellis Drug Discovery Intelligence (CDDI), and MetaBase™, identify relevant "proxy" indications for the effect of biochemical exposure based on symptoms and data, and prioritize gene targets with therapeutic potential for these proxy conditions.
- **Drug factor analysis** (2): Define exposure-specific intervention strategies, assess the top targets for clinical relevance and feasibility, and identify existing or late-stage drugs that fit the approach and are accessible.
- **Pathway reconstruction (MetaBase™)** (3): Reconstruct detailed mechanistic links between prioritized drugs, their targets, and chemical exposure pathology using curated pathways and molecular interactions.

Outcomes

- Developed **an innovative framework for prioritizing targets** in the context of **chemical** exposure **agents** with dearth of research data.
- **Informed public emergency policy** through recommendations for accessible drugs to ameliorate immediate and prevent long-term pulmonary and hematological toxicities of chlorine gas and sulfur mustard.
- **Real-world impact**: partnership with BARDA [see press release] led to actionable repurposing strategies for chemical exposure countermeasures.

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