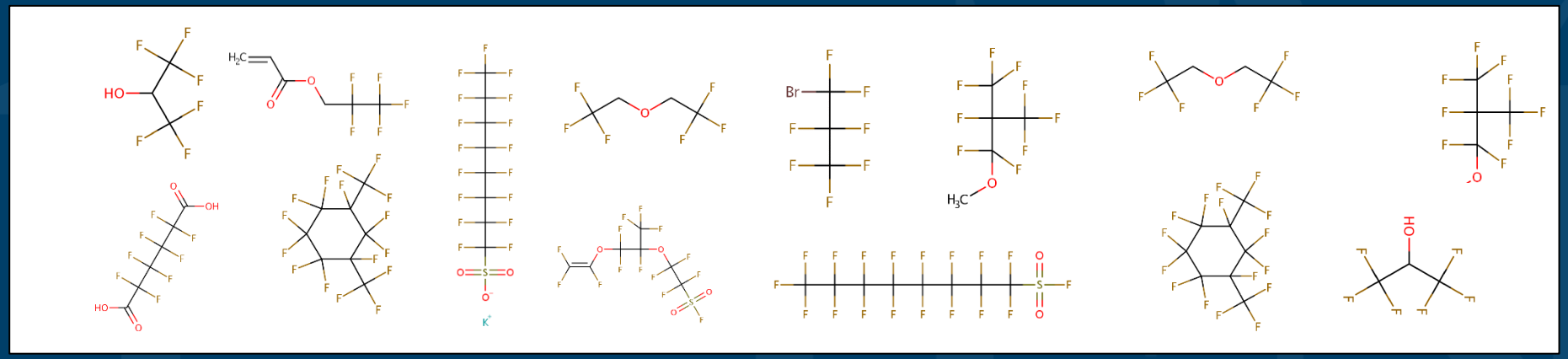
Research to Inform the EPA National PFAS Testing Strategy



The Science of PFAS Exposure and Effects on Human Health Webinar
December 8, 2022

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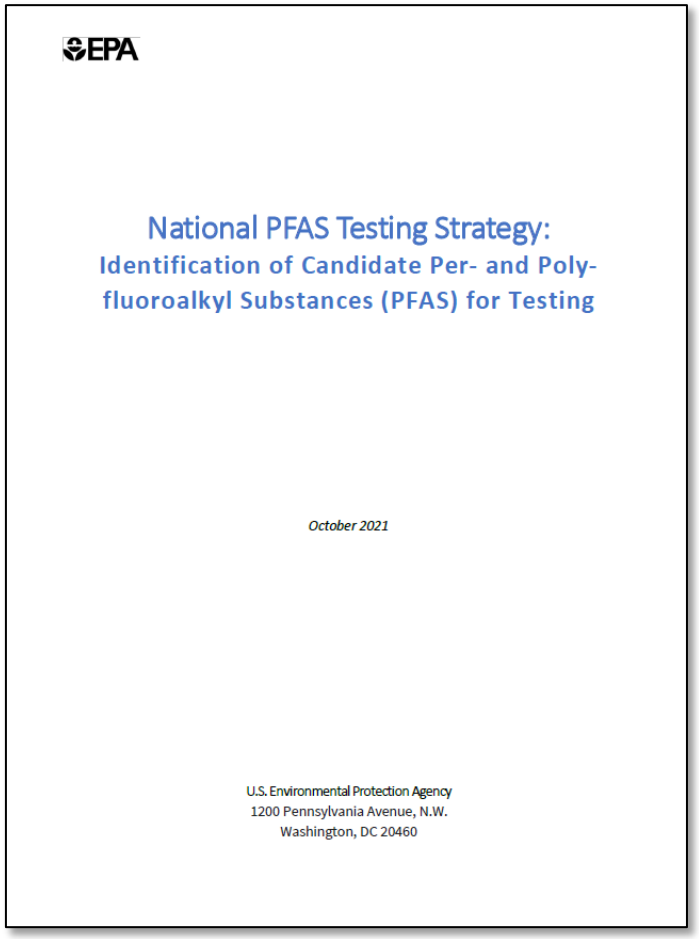
Research Focus and Objectives


EPA

National PFAS Testing Strategy:
Identification of Candidate Per- and Poly-fluoroalkyl Substances (PFAS) for Testing

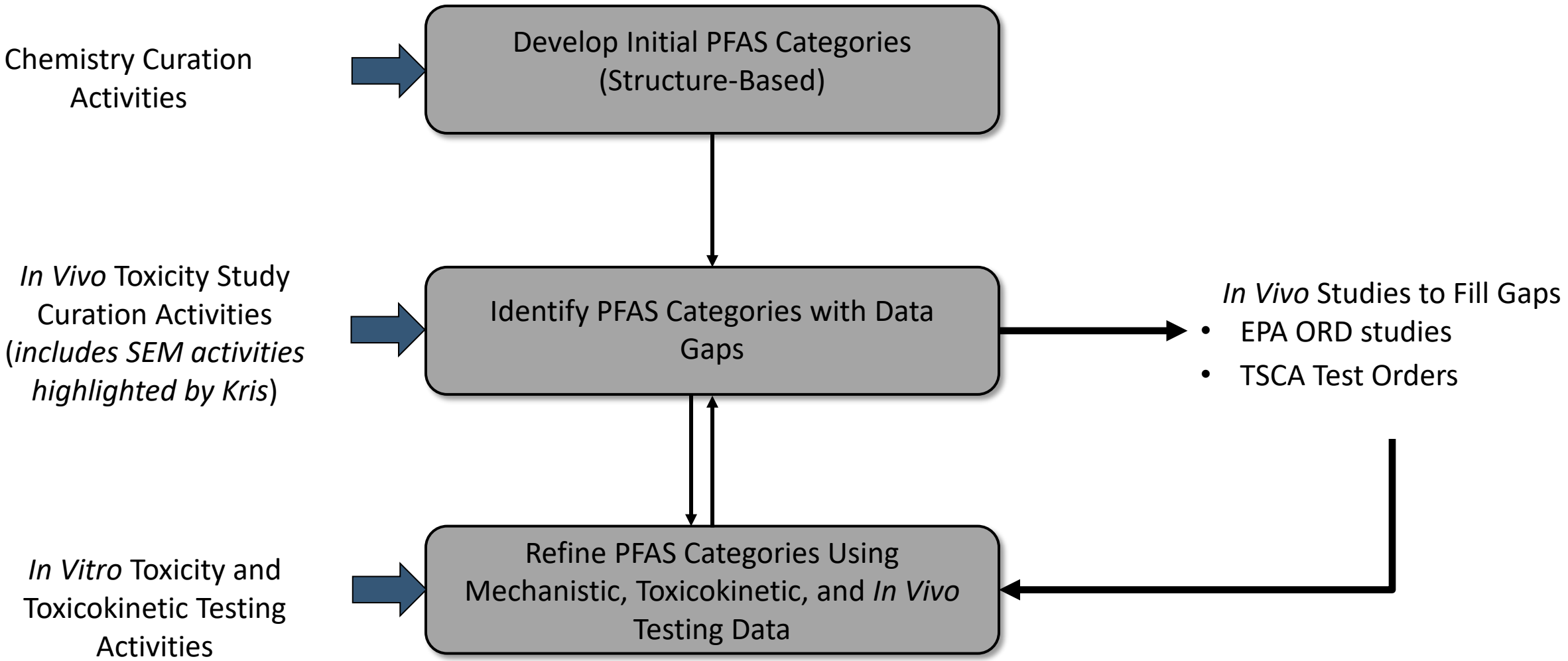
October 2021

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

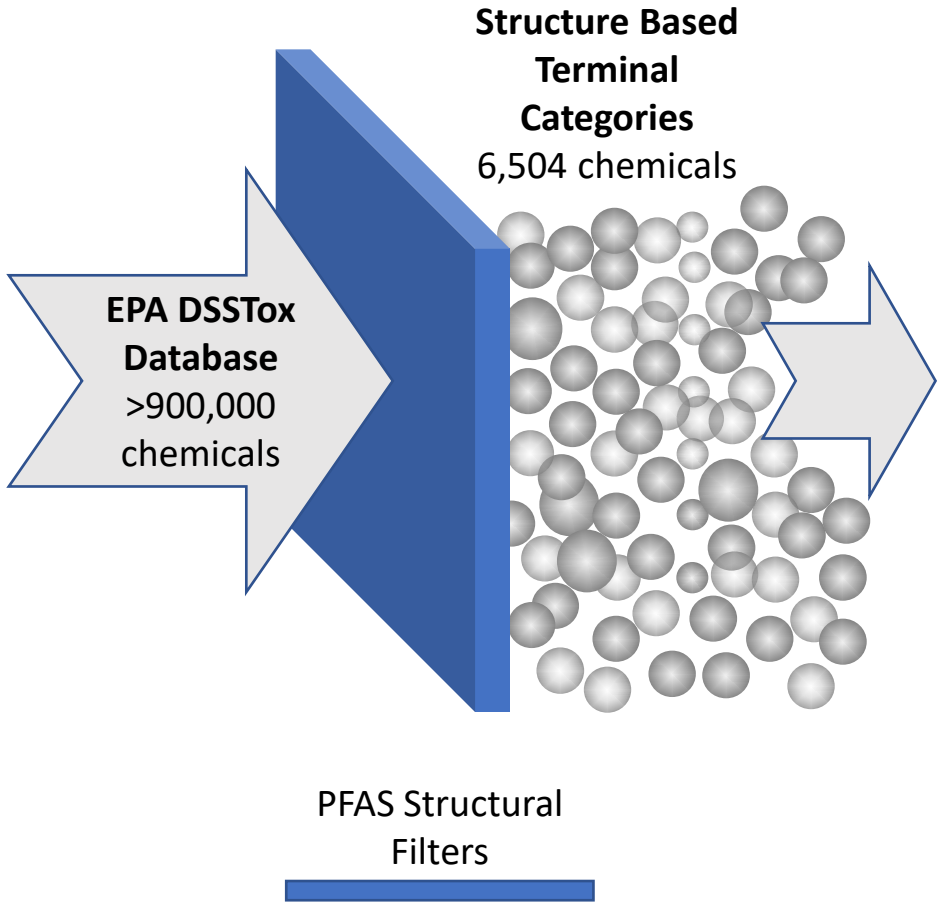
Given the large number of PFAS to which exposures may have occurred, research has been primarily focused on developing approaches that group PFAS into categories based on similarity in properties relevant to chemical risk assessment (e.g., structure, toxicokinetics, hazard, and mechanism of action).

- The categories serve as the basis for both identifying PFAS chemicals for testing as well as allowing EPA to establish toxicity levels for PFAS within the identified categories.
- The research aims to identify a representative substance(s) for each chemical category where categories have been constructed to span the landscape of PFAS of interest.

Develop and Refine PFAS Categories for to Strategically Identify PFAS Candidates for Testing



Testing Candidate Identification: Develop Initial PFAS Structural Categories



Structural Filters

1. Contains -CF2
2. Apply 'OPPT working definition'
3. Remove radicals, charge imbalanced
4. Remove specific types of 5 and 6 membered rings (aromatic, containing double bonds, heterocycles)

Primary Structural Categories*

1. PFAS derivatives
2. PFAAs
3. Perfluoro PFAA precursors
4. Non-PFAA Perfluoroalkyls
5. FASA-based PFAA Precursors
6. Fluorotelomer PFAA precursors
7. Silicon PFAS
8. Side-chain fluorinated aromatic PFAS
9. Other aliphatic PFAS

Secondary Structural Categories

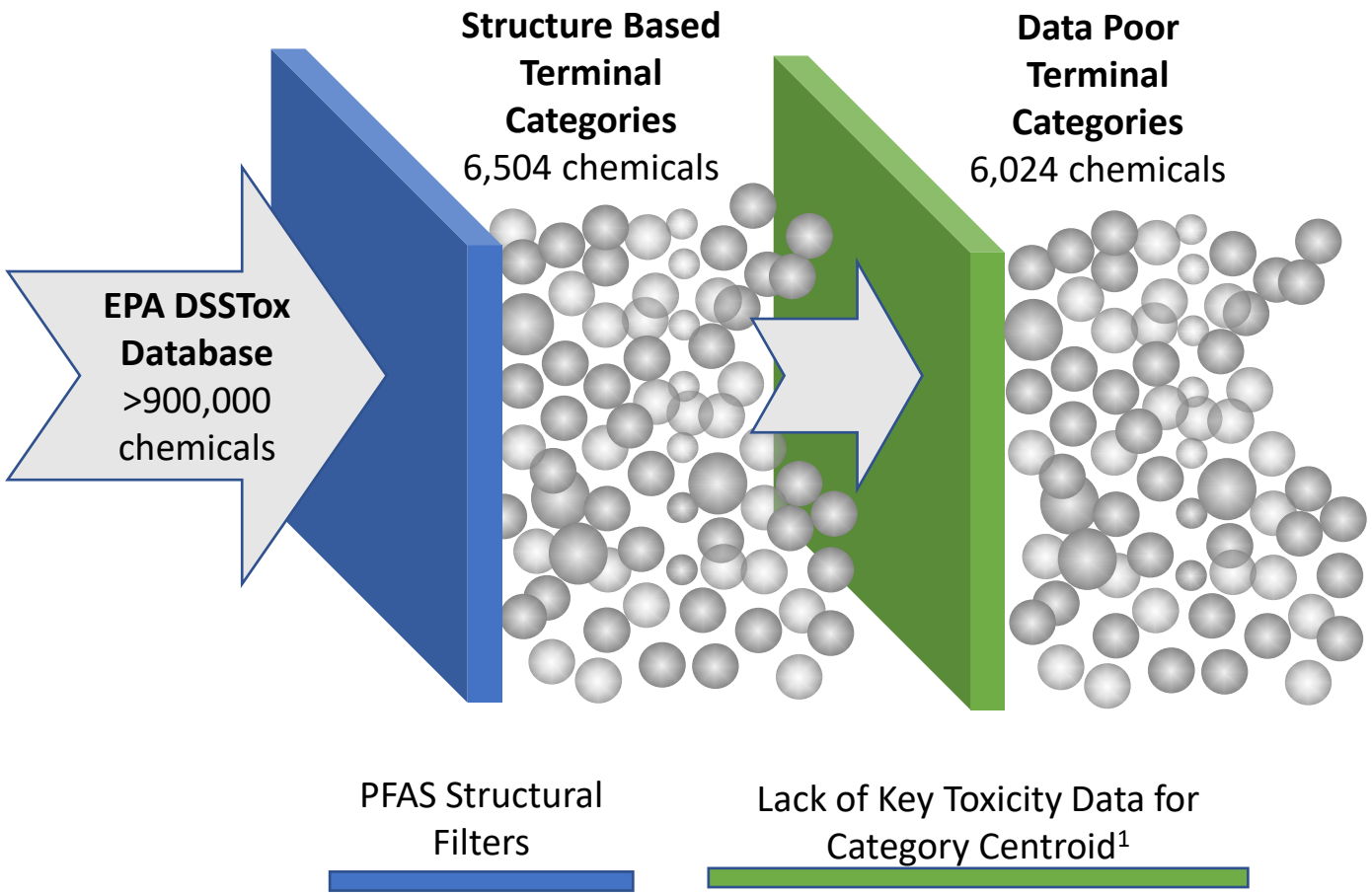
1. Greater than or equal to 8 carbons
2. Less than 8 carbons
3. Volatile (>100 mmHg Vapor Pressure)

Tertiary Structural Categories

Tertiary categorization performed only on Secondary Categories with structural diversity greater than a defined threshold

Testing Candidate Identification: Existing Toxicity Data

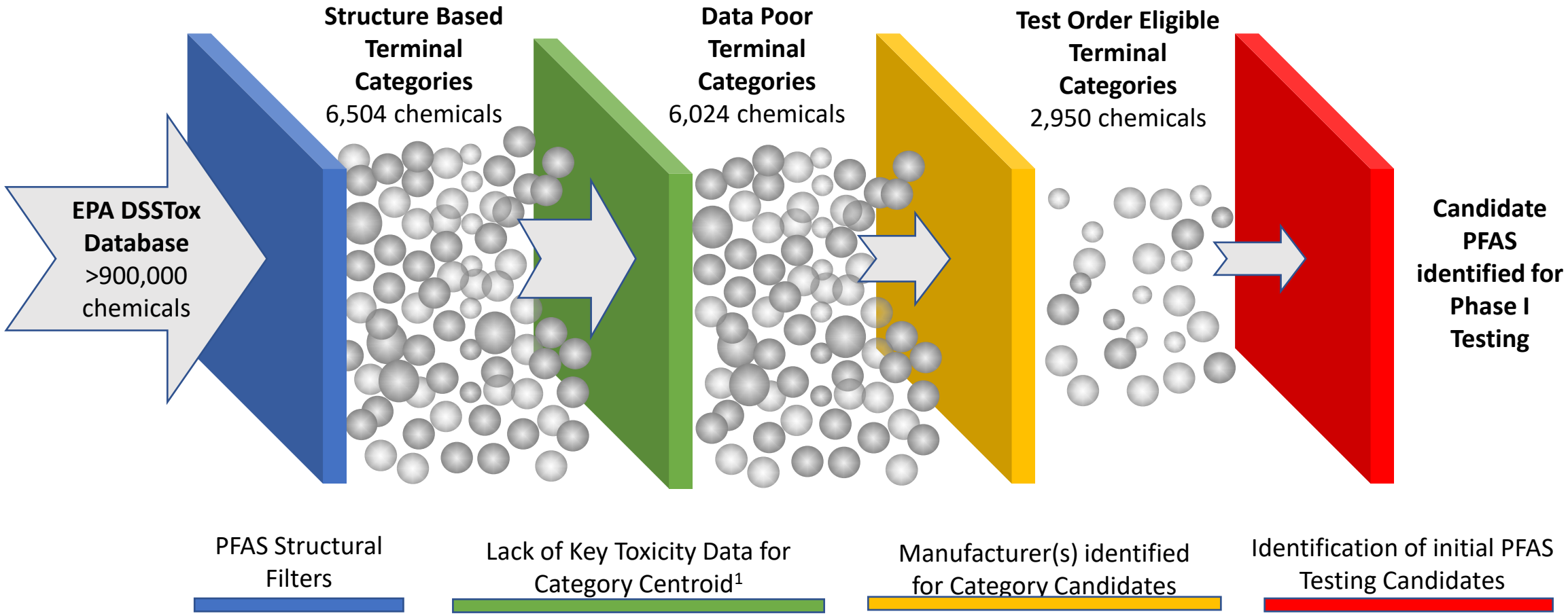
Prior to ordering testing using vertebrate animals, TSCA requires that available existing information be considered



Legacy *In Vivo* Toxicity Study Data Curation
Publicly Available (ORD) & TSCA Holdings (OPPT)

Testing Candidate Identification: Candidates for Testing

Initial PFAS candidates from Test Order Eligible Terminal Categories, which covers ~2,950 substances



*In some cases, a PFAS within the category with close structural distance to the category's centroid was selected as the candidate

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