Discussion of Priority Chemical List

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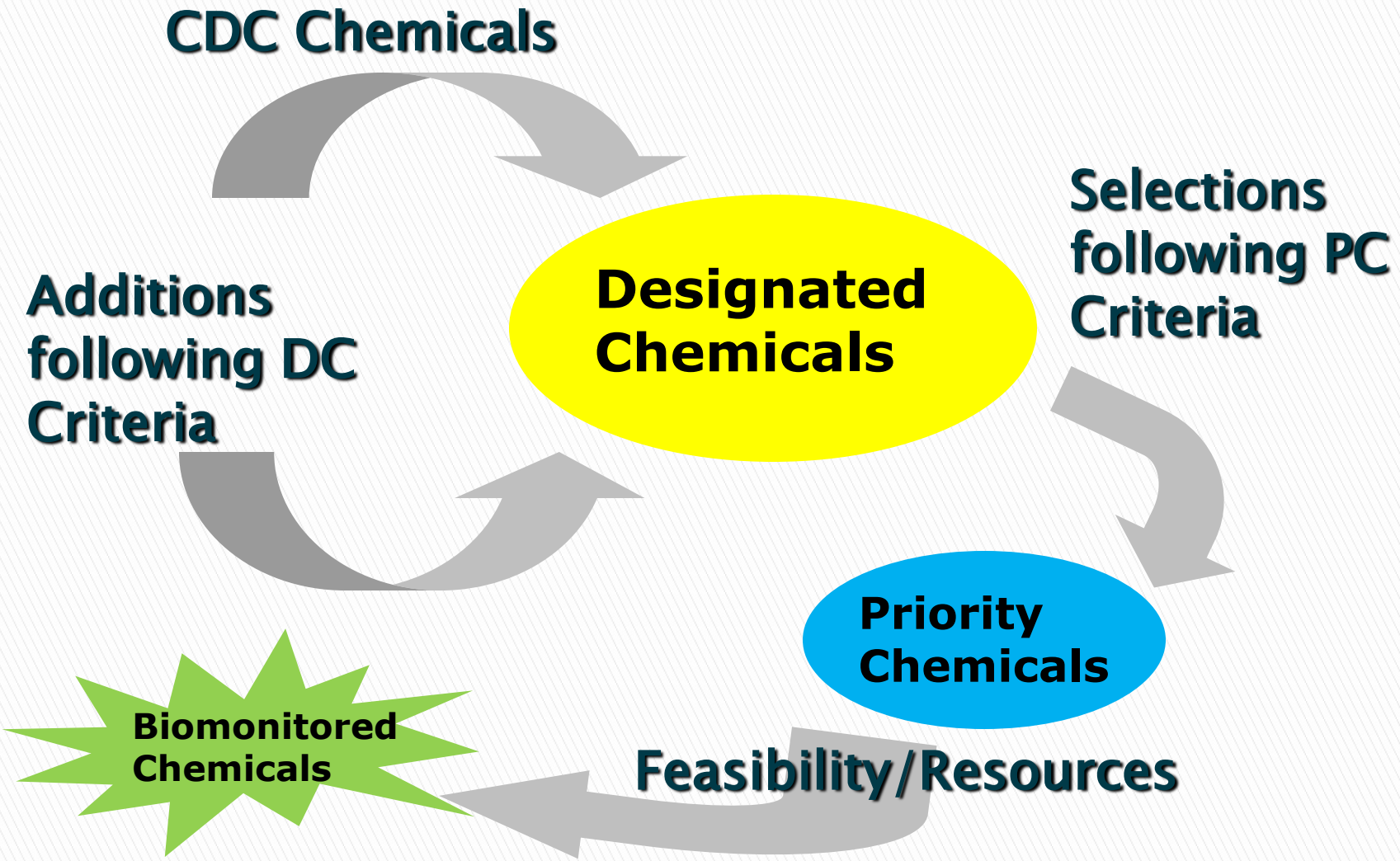

DC = Designated Chemicals

PC = Priority Chemicals

Criteria for recommending priority chemicals (SB 1379)

- The degree of potential ***exposure*** to the public or specific subgroups
- The ***likelihood of a chemical being a carcinogen or toxicant*** based on peer-reviewed health data, the chemical structure, or the toxicology of chemically related compounds
- The ***limits of laboratory detection*** for the chemical, including the ability to detect the chemical at low enough levels that could be expected in the general population
- ***Other criteria*** that the panel may agree to

CECBP priority chemicals

- Priority chemicals consist of:
  - 2 chemical classes (in their entirety)
  - 76 chemical substances (including the mixture diesel exhaust)
- Even with the CDC cooperative agreement, the CECBP laboratories cannot develop methods for all priority chemicals at the same time

CECBP priority chemicals

- Metals (cadmium, lead, mercury, arsenic)
- Environmental phenols (bisphenol A, triclosan)
- Perchlorate
- Diesel exhaust
- Cotinine
- Brominated and chlorinated organic compounds used as flame retardants
- Polycyclic aromatic hydrocarbons (3-hydroxybenzo[a]pyrene, 6-hydroxychrysene, 3-hydroxyphenanthrene)
- Organophosphate insecticides*
- Pyrethroid pesticides*
- Phthalates*
- Cyclosiloxanes
- Other pesticides (DDT, *para*-Dichlorobenzene, 2,4-D)
- Perfluorinated compounds*

* Only those members of the class that are already designated chemicals

Measurement of CECBP chemicals

- CECBP is determining the appropriate target compound(s) for measurement:
  - May be the parent, a particular isomer, a key metabolite, or other relevant indicator compound
  - May change as method development proceeds

Overview of materials for priority chemical discussion

- Table on priority chemicals
  - Emphasis on laboratory considerations
  - Background information (provided at previous SGP meetings)
    - CDC biomonitoring results
    - CECBP designated chemical documents
    - Related articles
- Materials available on biomonitoring website

Priority chemical lab capability: "Now"

- Priority chemicals for which lab has current capability for measurement ("now")
  - Metals (Pb, Cd, Hg)
  - Pyrethroid metabolite common to 3 priority pyrethroids (3-phenoxybenzoic acid)
  - Chlorpyrifos (specific OP metabolite)
  - 11 PBDEs
  - DDT

Priority chemical lab capability: "Soon"

- Priority chemicals for which lab expects to develop capability for measurement within 12 months ("soon")
  - DAP metabolites (organophosphates)
  - Perchlorate
  - Environmental phenols (triclosan, bisphenol A)
  - Arsenic
  - 3-Hydroxyphenanthrene (PAH)
  - 10 brominated or chlorinated flame retardants
  - Four phthalate metabolites
  - 12 perfluorinated compounds

Priority chemical lab capability: “Later”

- Priority chemicals for which lab expects to develop capability for measurement in more than 12 months (“later”)
  - Diesel exhaust
  - Other pyrethroid metabolites
  - Two phthalate metabolites
  - Cyclosiloxanes
  - Two polycyclic aromatic hydrocarbons (PAHs)

CDC cooperative agreement: EHL (CDPH)

Analytes in urine+ (except metals in blood)	Instrumentation*	With CECBP resources		With CDC Cooperative Agreement resources							
				Year 1		Year 2		Year 3		Year 4		Year 5	
		Method stage†	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity
Metals in blood (a)	ICP-MS	P	500	F	1000+	F	1000+	F	1000+	F	1000+	F	1000+
Metals panel (b)		-	-	M	500	F	1000+	F	1000+	F	1000+	F	1000+
Perchlorate	IC-MS/MS*	-	-	M	100	P	400	F	1000+	F	1000+	F	1000+
As speciation (c)	HPLC-ICP-MS	-	-	M	100	P	200	F	400+	F	400+	F	400+
OP Pesticides (d)	HPLC-MS/MS*	M	100	P	250	F	1000+	F	1000+	F	1000+	F	1000+
Pyrethroid pesticides		-	-	-	-	M	100	P	400	F	1000+	F	1000+
OP-DAP (e)	GC-MS/MS*	-	-	M	100	P	250	P	600	F	1000+	F	1000+
Bisphenol A	HRGC-MS or HPLC-MS/MS	M	100	P	250	F	1000+	F	1000+	F	1000+	F	1000+
Phthalates	HPLC-MS/MS	M	100	P	250	F	1000+	F	1000+	F	1000+	F	1000+
Total Assays per year			800		2550+		5950+		7400+		8400+		8400+

+Analytes
a. Pb, Hg, Cd in whole blood.
b. As, U, and others to be determined (likely Cr, Mn, and Se)
c. Considering using same instrumentation for Hg speciation
d. Specific metabolites of organophosphate (OP) pesticides
e. Dialkyl phosphate (DAP) metabolites

†Method stage
M = method in development; P = partial capacity; F= full capacity

*Instrumentation:
Instruments to be purchased in Year 1 of the Cooperative Agreement are asterisked; others are already installed.

CDC cooperative agreement: ECL (DTSC)

Analytes in serum+	Instrumentation*	With CECBP resources				With CDC Cooperative Agreement resources							
		Currently		Year 1		Year 2		Year 3		Year 4		Year 5	
		Method stage†	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity	Method stage	Assay capacity
PBDEs	HRGC-MS	-	-	M	100	P	600	F	1000	F	1000+	F	1000+
Add'l Fire Retardants (a)	HRGC-MS*	-	-		-	M	100	P	600	F	1000+	F	1000+
Hydroxylated PBDEs	HPLC-MS/MS	-	-	-	-	-	-	M	100	F	1000+	F	1000+
Perfluorinated Chemicals	HPLC-MS/MS	M	-	P	600	F	1000	F	1000	F	1000+	F	1000+
Cyclosiloxanes	HRGC-MS*	-	-	-	-	-	-	M	100	P	600	F	1000+
New Chemicals (b)	HPLC-TOF-MS *	-	-	-	-	-	-	-	-	-	-	M	-
Total Assays per year					700		1700		2800+		4600+		5000+

+Analytes
a. Brominated and chlorinated flame retardants (refer to **Appendix D** - CECBP Designated and Priority Chemicals)
b. To be defined, pending recommendations from the Scientific Guidance Panel and the public

†Method stage
M = method in development; P = partial capacity; F= full capacity

*Instrumentation
Instruments to be purchased under the Cooperative Agreement are asterisked; others are already installed.
HRGC-MS to be purchased in Year 2 of Cooperative Agreement
HPLC-Time of Flight (TOF)-MS to be purchased in Year 5 of Cooperative Agreement

Priority chemical lab capability: "Not planned"

- Priority chemicals for which method development is currently "not planned"
  - Cotinine (tobacco smoke)
  - *para*-Dichlorobenzene
  - 2,4-Dichlorophenoxyacetic acid
  - 17 chlorinated or brominated flame retardants
  - Two phthalate metabolites (dimethyl phthalate, dicyclohexyl phthalate)
  - Two perfluorinated compounds (perfluorobutane sulfonic acid, perfluorooctane sulfonamide)

Questions for SGP discussion

- What additional chemical(s) would you like to see ECL develop methods for in year 5 of the CDC cooperative agreement?

- Are there priority chemicals for which method development is “not planned” for which you would like to see methods developed?