Derivation of RPFs for Selected PAHs

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RPFs across all routes of exposure

- EPA should have derived RPFs separately for each route of exposure based on the available scientific data.
  - Schneider et al. (2002)* performed a comparison of relative potency factors derived from various studies using different routes of exposure and found that cross route extrapolation is not scientifically justified.

*Schneider, K., M. Roller, F. Kalberlah, U. Schuhmacher-Wolz. 2002. Cancer risk assessment for oral exposure to PAH mixtures. J App Toxicol 22:73-83.

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Averaging RPFs for Multiple Target Organs

- The RPF approach should not use the highest average RPFs from multiple target organs in order to determine a final RPF as this introduces a bias to the calculation.
- How data are averaged in the RPF approach has significant effects across the PAHs classified
- RPFs for 12 PAHs were recalculated using an alternative averaging method as highlighted on the next slide. Four RFPs were unchanged, but eight RFPs were lower.
- See Pages 8 –10 of our submitted written comments for more detail.

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Recalculation of Select RPFs Using Alternative Methodology

Analyte	EPA (2010) Range RPFs	EPA (2010) Average RPF	Recalculation[1]	Change in RPF
Benz[a]anthracene	0.02–0.4	0.2	0.1	Lower
Benzo[b]fluoranthene	0.1–2	0.8	0.6	Lower
Benzo[c]fluorene	1–50	20	10	Lower
Benz[e]aceanthrylene	0.6–0.9	0.8	0.7	Lower
Benzo[j]fluoranthene	0.01–1	0.3	0.2	Lower
Benz[l]aceanthrylene	4–7	5	4	Lower
Dibenz[a,h]anthracene	1–40	10	9	Lower
Fluoranthene	0.009–0.2	0.08	0.07	Lower

Notes:
[1] See text. RPFs are rounded to one significant figure per EPA (2010) procedures.

- For a given route of administration and reference, average incidence and multiplicity RPFs for the same sex and target organ
- Average RPFs for males and females for the same target organ
- Average RPFs for all target organs
- Average across routes of administration and references to one significant figure

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Good Fit Evaluations

- The RPF approach does not provide criteria for defining a "good fit" of the data.
- In the RPF approach, when Benchmark Dose Modeling (BMD) of multi-dose results provided a "poor fit" the protocol required that "point estimates" from single dose groups be used for RPF derivation. Out of 43 data sets used by EPA:
  - 18 (42%) used a single B(a)P dose and single doses for other PAHs
  - 13 (30%) used a single B(a)P dose and a dose-response curve for other PAHs
  - 12 (28%) used a dose-response curve for B(a)P dose and a dose-response curve for other PAHs
- EPA should use the three goodness-of-fit metrics available in the BMD Software to guide selection of the optimal model for deriving RPFs. A validation of different model fits are detailed in Appendix C of our written comments.

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EPA's Confidence Rating

- RPFs for any PAH that receives a *"low confidence or very low confidence rating*" should not be finalized

PAH	Relative Confidence	EPA RPF Value
Benz[e]aceanthrylene	Low	0.8
Benz[j]aceanthrylene	Low	60
Benz[l]aceanthrylene	Low	5
Dibenzo[a,e]fluoranthene	Low	0.9
Dibenzo[a,h]pyrene	Low	10
Dibenzo[a,i]pyrene	Low	0.6
Dibenz[a,c]anthracene	Very Low	4

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