

US EPA ARCHIVE DOCUMENT



# Adverse Outcome Pathways in Chemical Risk Management

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## A Regulatory Program Perspective

Office of Chemical Safety and Pollution Prevention (OCSPP)

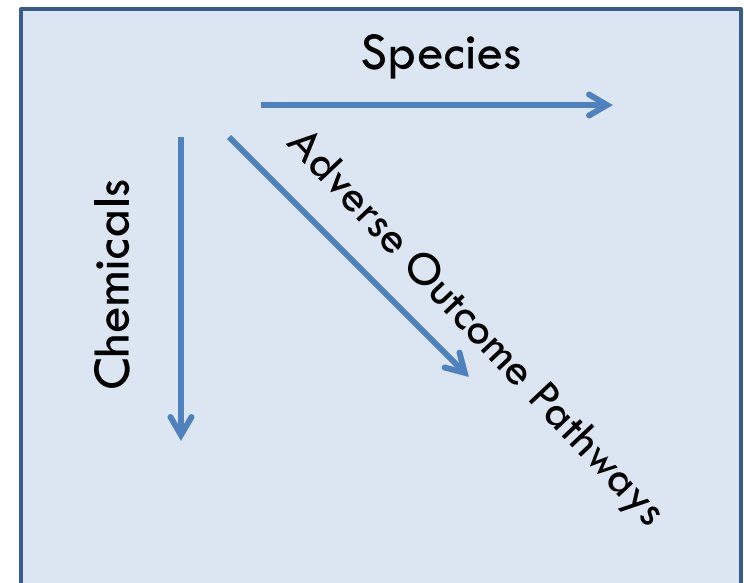
PPDC Presentation: July 2013



# Managing Chemical Risks

## Goals & Challenges

- Many chemicals
- Many possible adverse effects
- Many species/biological systems
- Finite resources/time
- Transparent decisions
- Scientific soundness



# Adverse Outcome Pathways (AOPs)

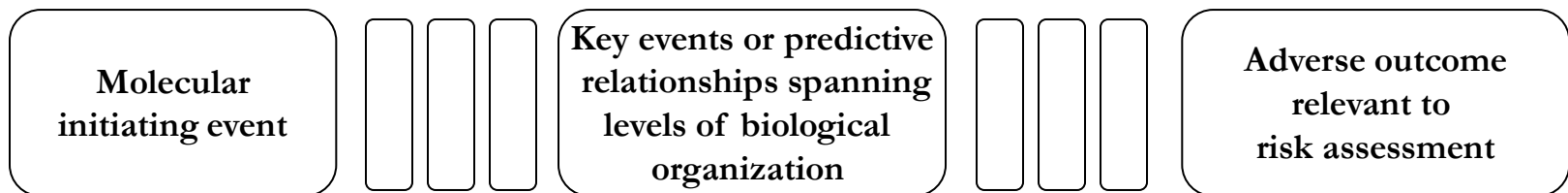
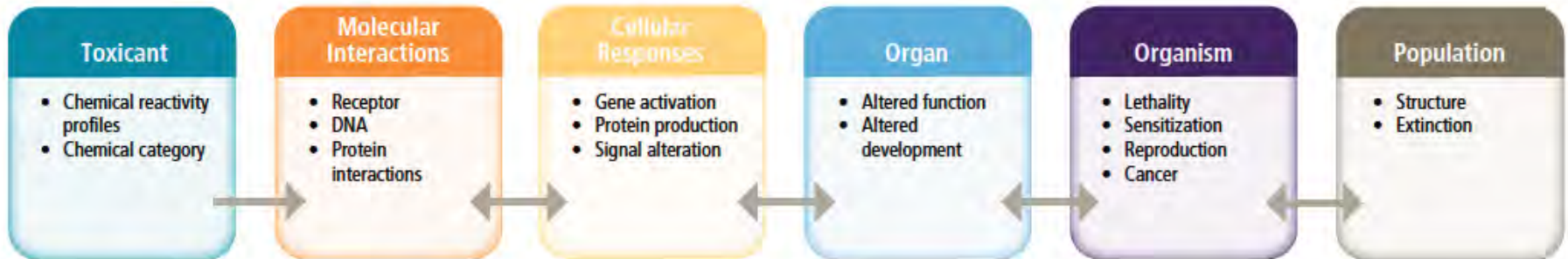


## Structure Activity Relationships

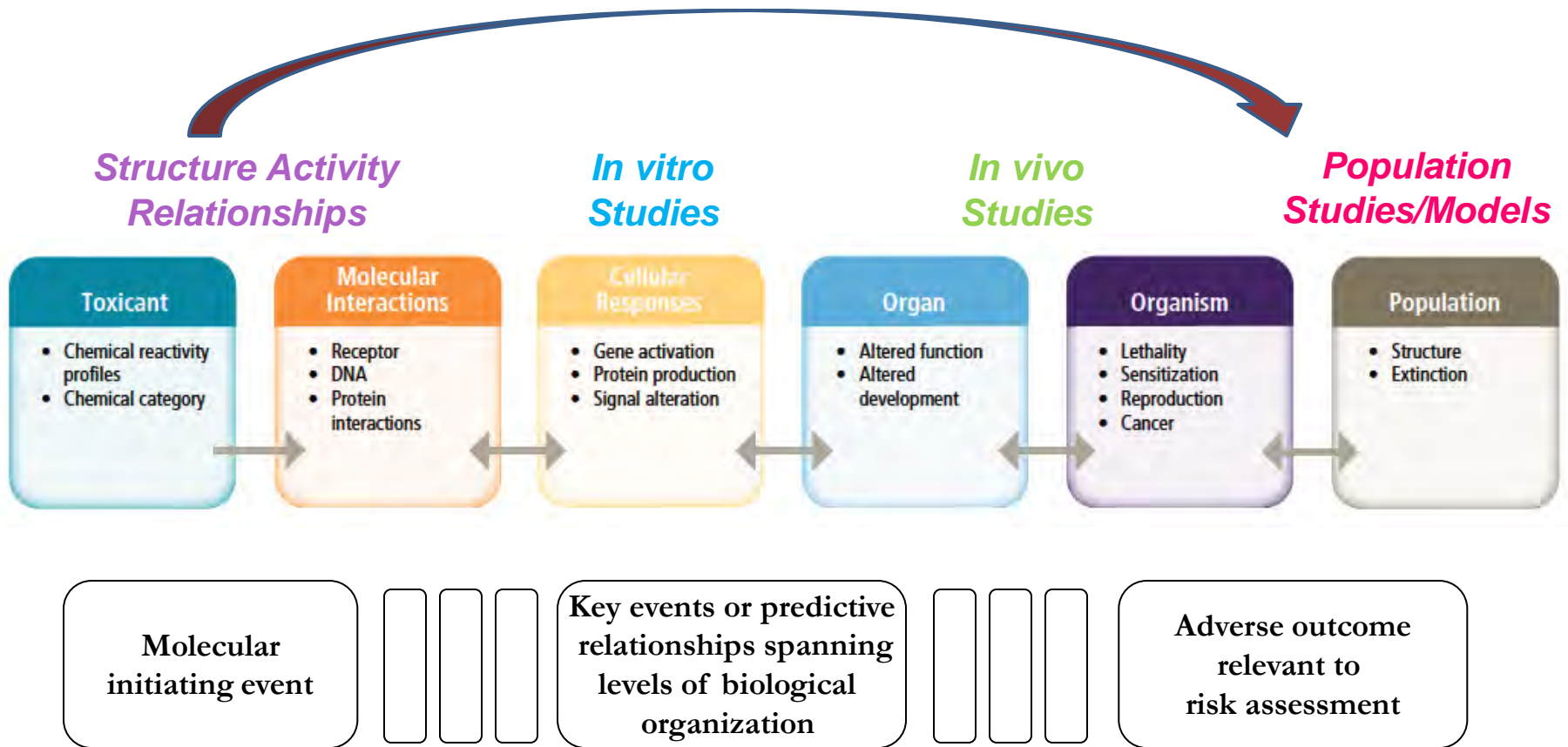
## In vitro Studies

## In vivo Studies

## Population Studies/Models

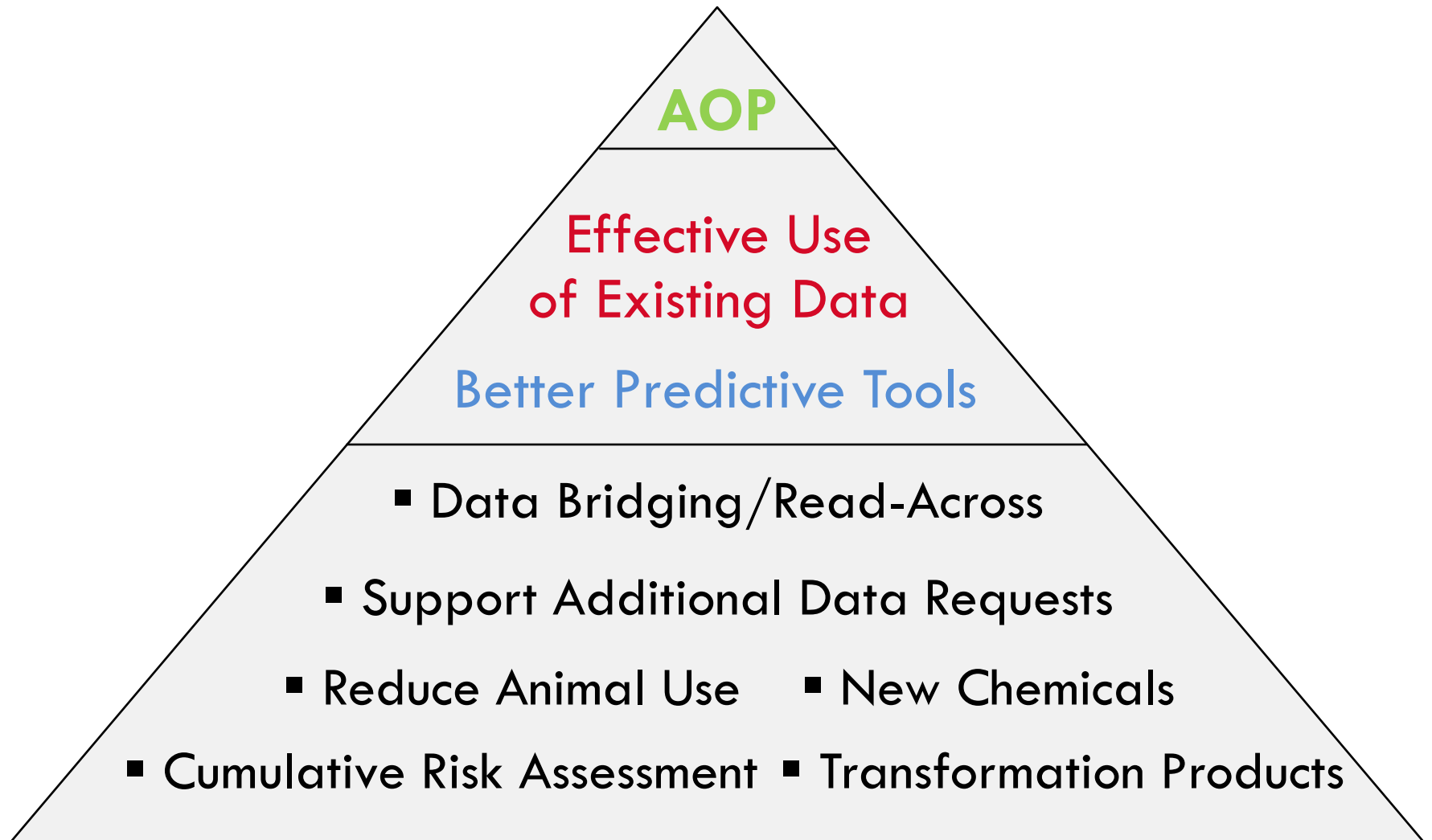


# Adverse Outcome Pathways (AOPs)

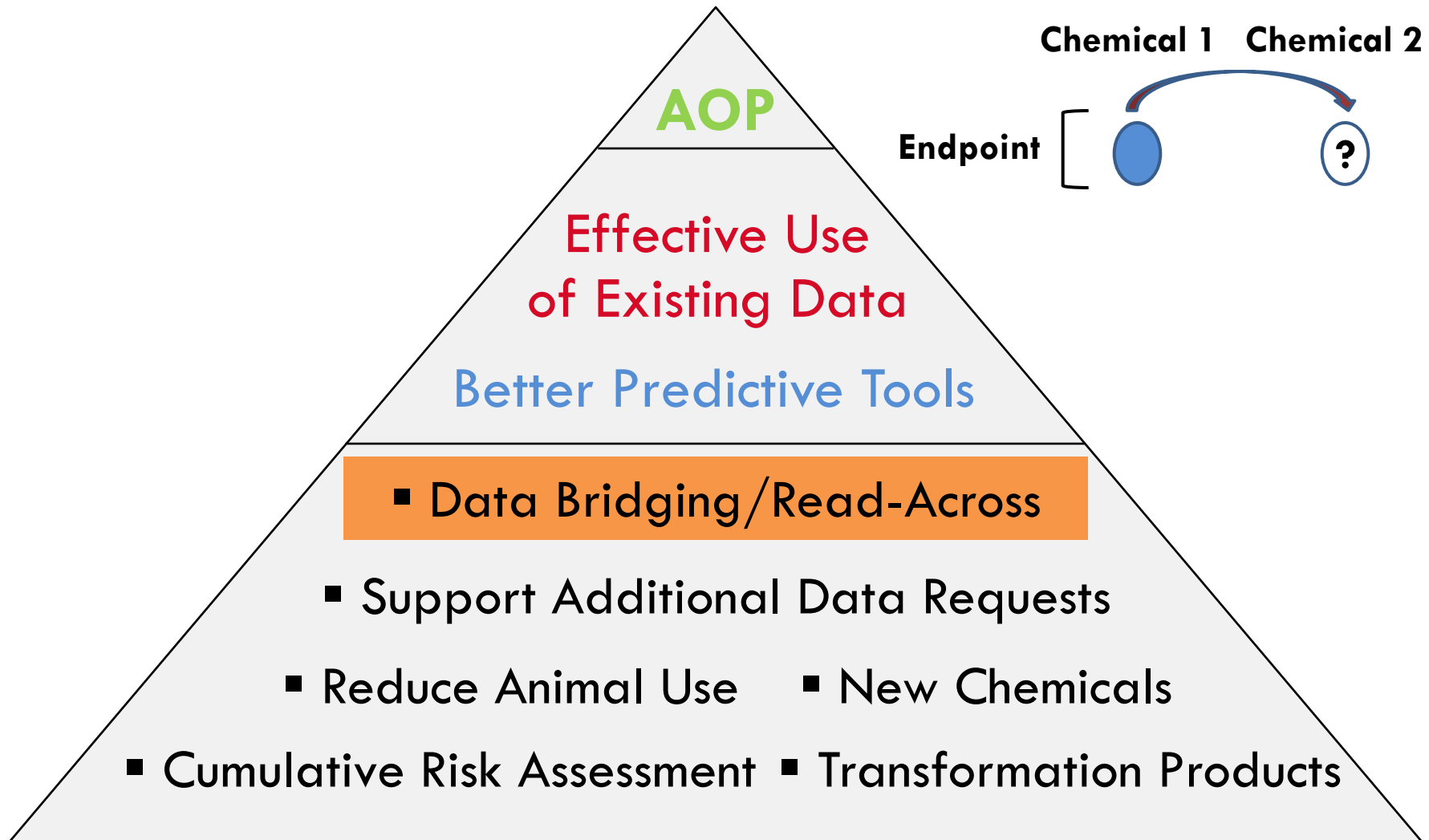




# Utility of AOPs

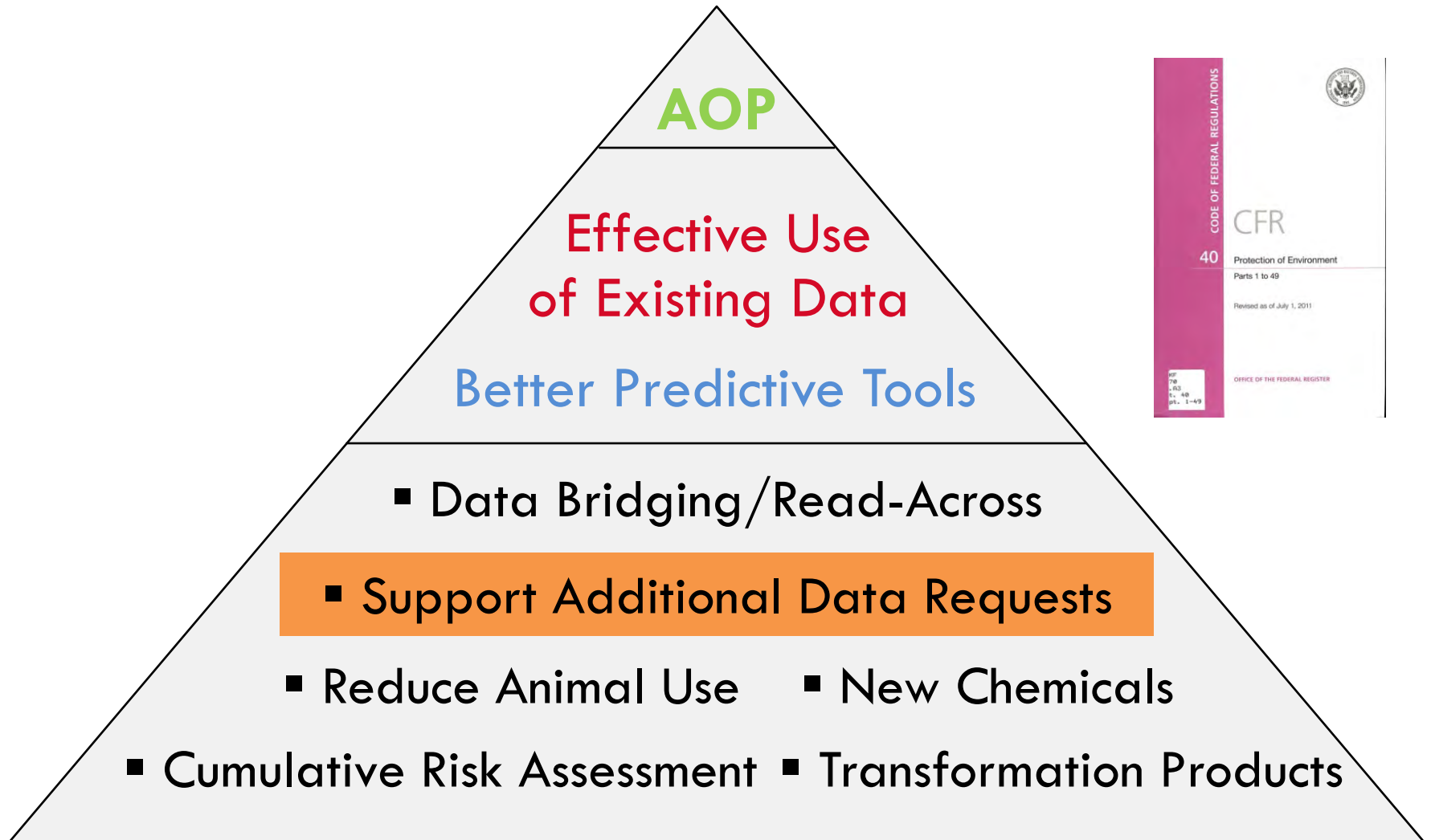


# Utility of AOPs



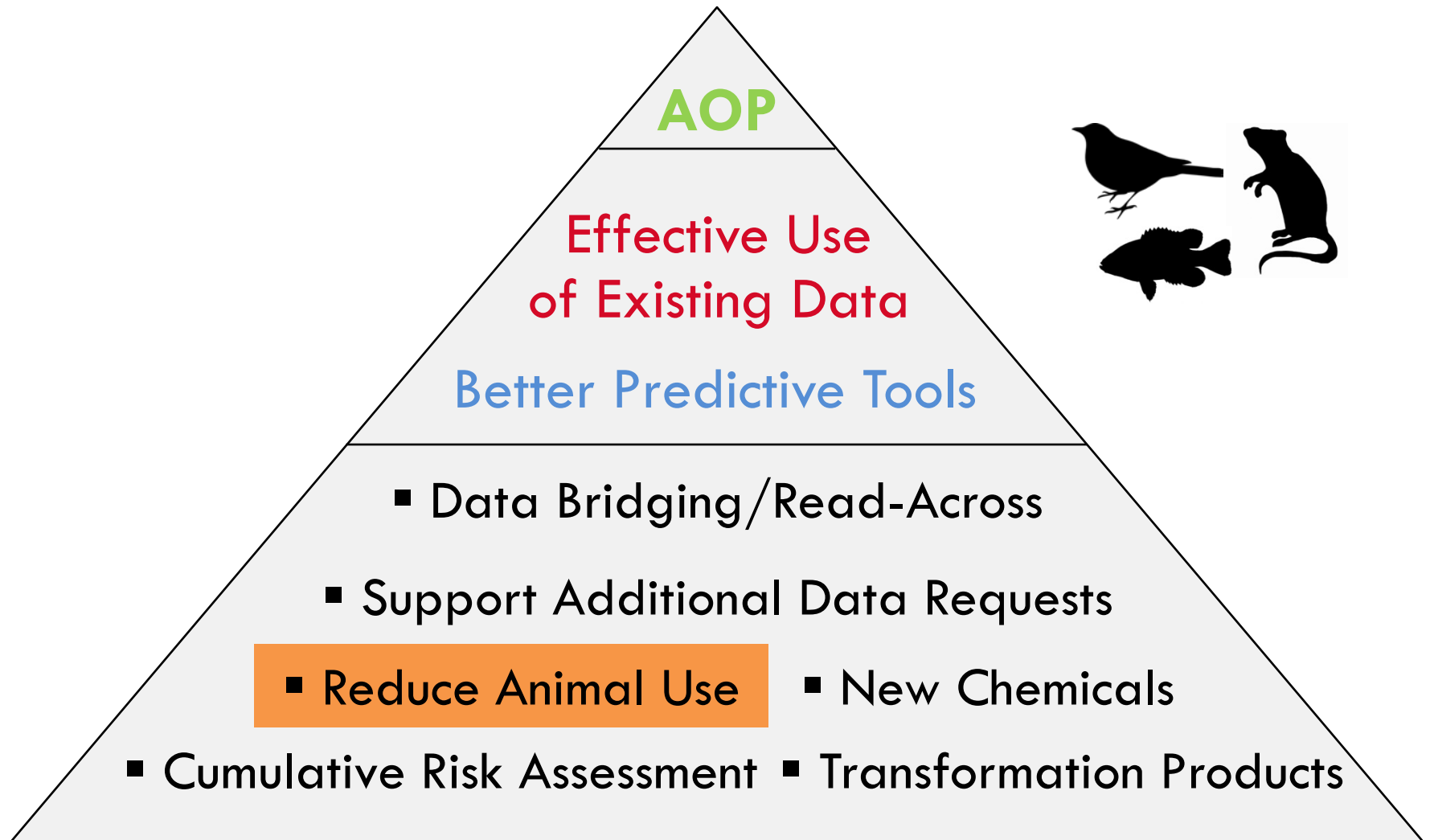


# Utility of AOPs

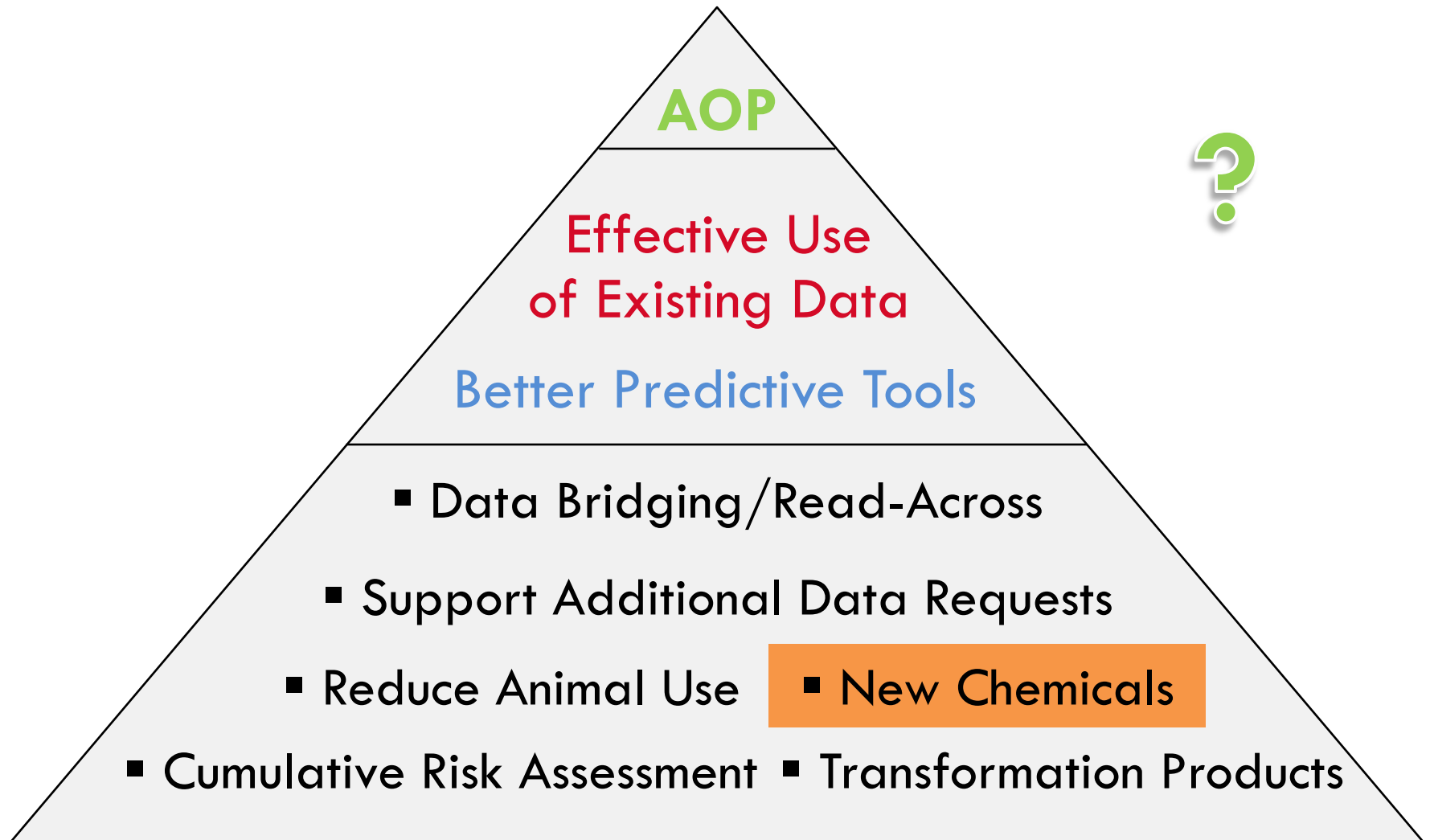




# Utility of AOPs



# Utility of AOPs





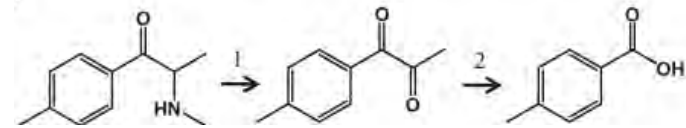
# Utility of AOPs

AOP

Effective Use  
of Existing Data

Better Predictive Tools

- Data Bridging/Read-Across
- Support Additional Data Requests
- Reduce Animal Use
- New Chemicals
- Cumulative Risk Assessment
- Transformation Products





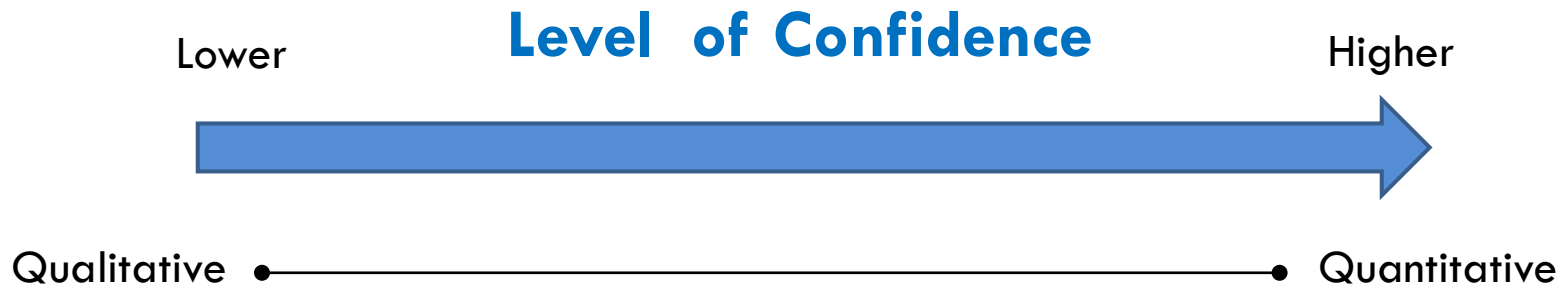
# Challenges for Using AOPs

- Building AOP libraries takes time
  - But there will be incremental steps
  - Effective use of 'omics' and high throughput approaches can help accelerate AOP discovery, development, evaluation
- Establishing AOP linkages
  - Support transition from qualitative to quantitative uses (dose response relationships)
- Understanding interspecies differences in AOPs
- Capture sensitive endpoints

# Integrating into Regulatory Process



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## Level of Confidence

Lower

Higher



Qualitative •—————• Quantitative

Priority Setting •—————• Quantitative Risk Assessment



# Integrating into Regulatory Process



## Level of Confidence

Lower

Higher



Qualitative



Quantitative



Priority Setting



Quantitative  
Risk Assessment



(Uncertainties Acceptable?)



Thank You!  
Questions?