



#### **22<sup>nd</sup> Annual Green Chemistry and Engineering Conference**

# How is experimental ecotoxicity data traditionally collected and used to assess chemicals?









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## Experimental Measurements of Toxicity In Vivo

#### • Acute Toxicity test

- Lethality Testing Kill and count them studies
- Time = 2 days (invertebrates) to 4-7 days. (fish)
  - LD<sub>50</sub>
  - LC<sub>50</sub>
  - TL<sub>m</sub> (median tolerance dose)
  - EC<sub>50</sub> (effective concentration)
    - Lose equilibrium, sit on bottom  $\rightarrow$  "ecologically" dead
- Relatively cheap (but still over \$1000/test per test)







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## Experimental Measurements of Toxicity In Vivo

#### • Chronic toxicity test

- Growth, viability, reproduction
- More ecologically relevant data but takes longer, more expensive
- Often shows effect at much lower dose
- Test requires substantial labor and infrastructure
  - NOEC (No Effect Concentration)
  - LOEC (Low Effect Concentration)







# 22<sup>nd</sup> Annual Green Chemistry and Engineering Conference Major advantages of these tests

# Data collected from a small set of 'standard' organisms Why an advantage? Disadvantage?

Large sets of data collected using fairly uniform methods

Case studies will illustrate the utility of this "simple" data

