

# Epi/tox view on Benchmark dose by Jeff Swartout

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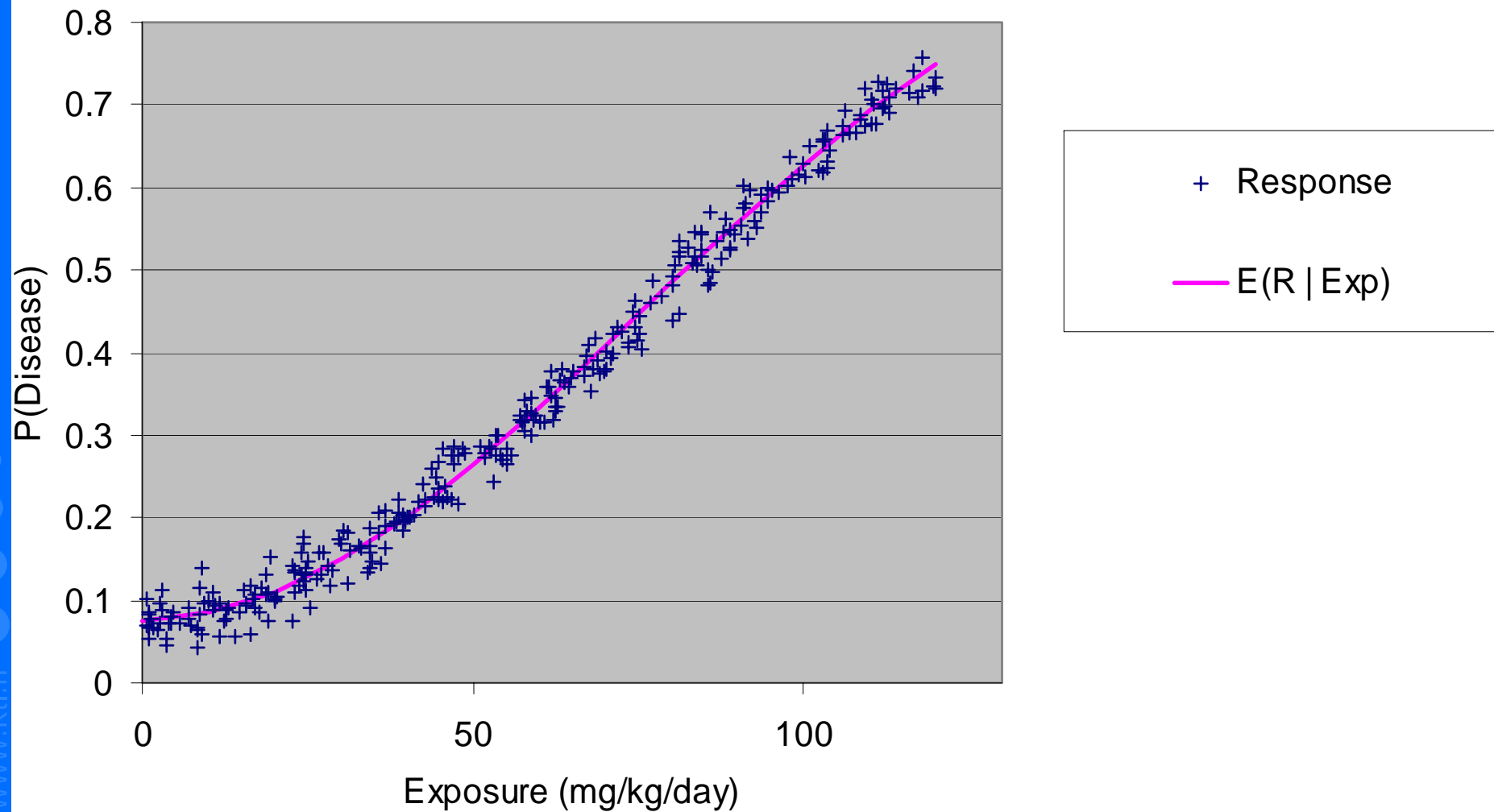
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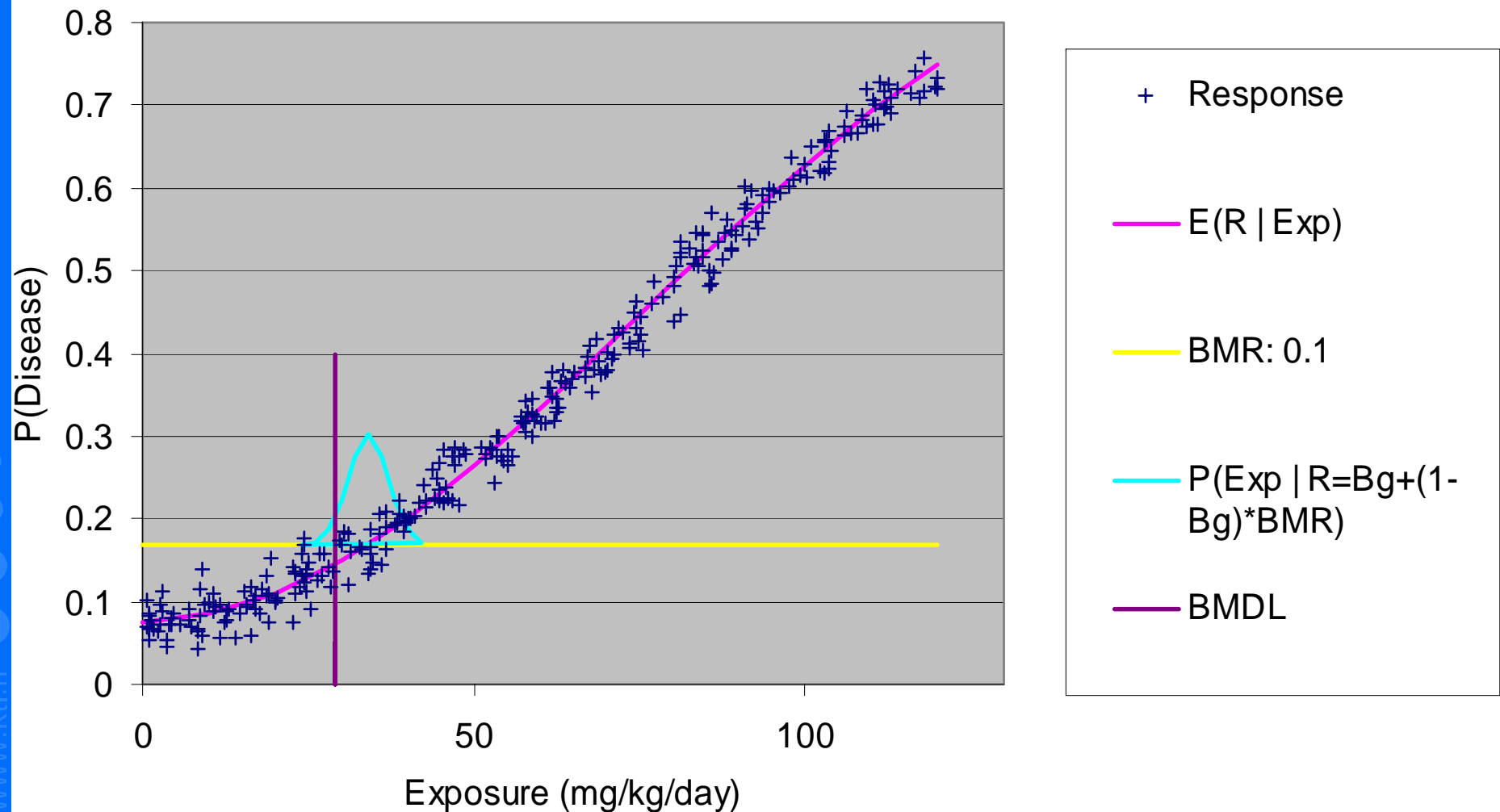
# What is the research question?

- It should pass the clairvoyant test
- What is the probability of having a response **R** in an individual of a large population **Pop** at time **t** after an exposure pattern **Exp**?
  - R: What is the outcome measured?
  - R: what is the magnitude for a positive response?
  - What is the target population?
  - What is the time of observation?
  - What is the exposure pattern?

# Probability of response R



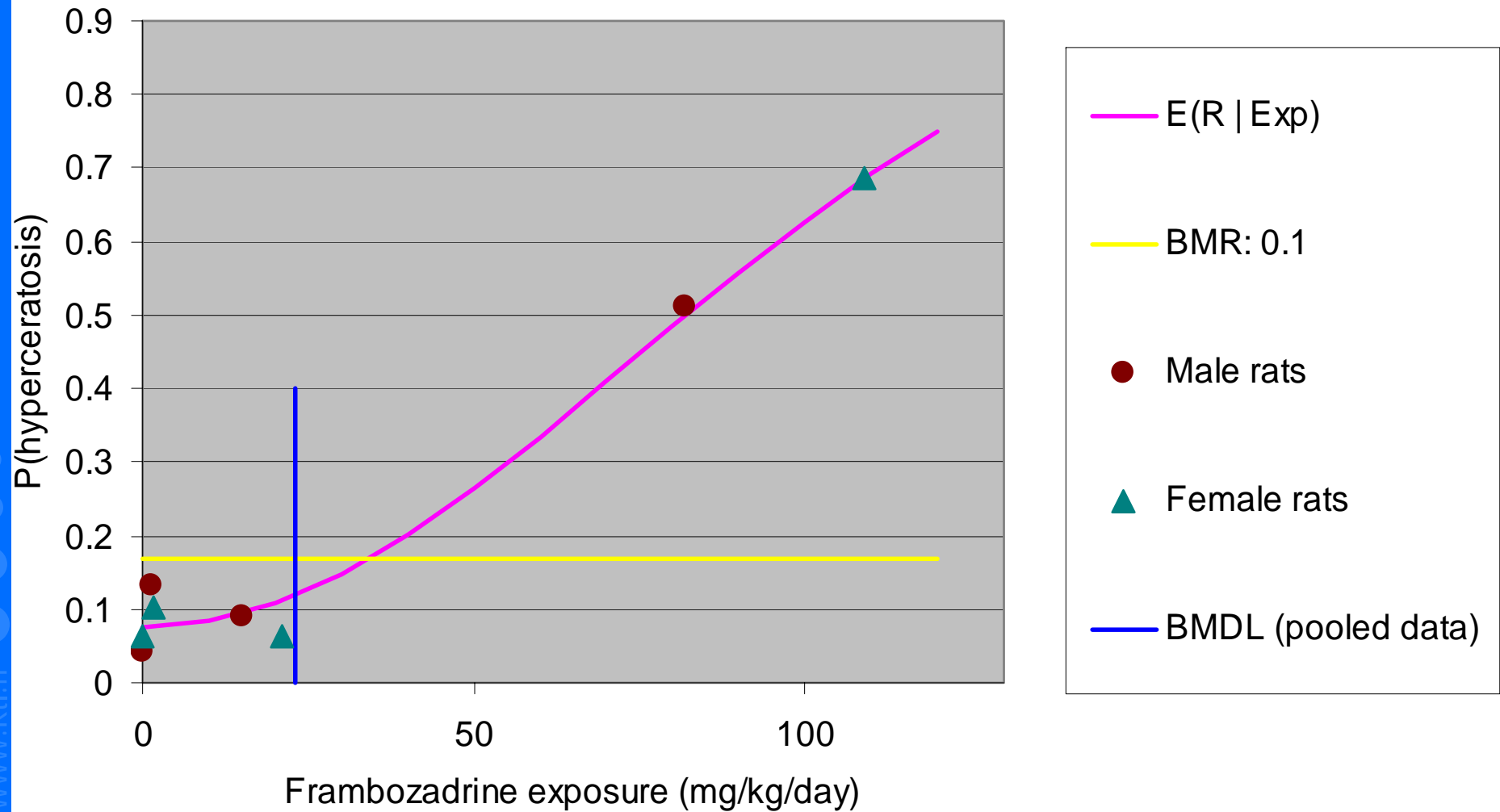
# Benchmark dose for R



# Critical assumptions

- The function used reflects reality
  - The number of parameters used allows for enough flexibility
  - The values of parameters  $\geq 0$
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- There is no toxicological or epidemiological support for exactly these assumptions
  - Assumptions are more based on conventions than knowledge about reality

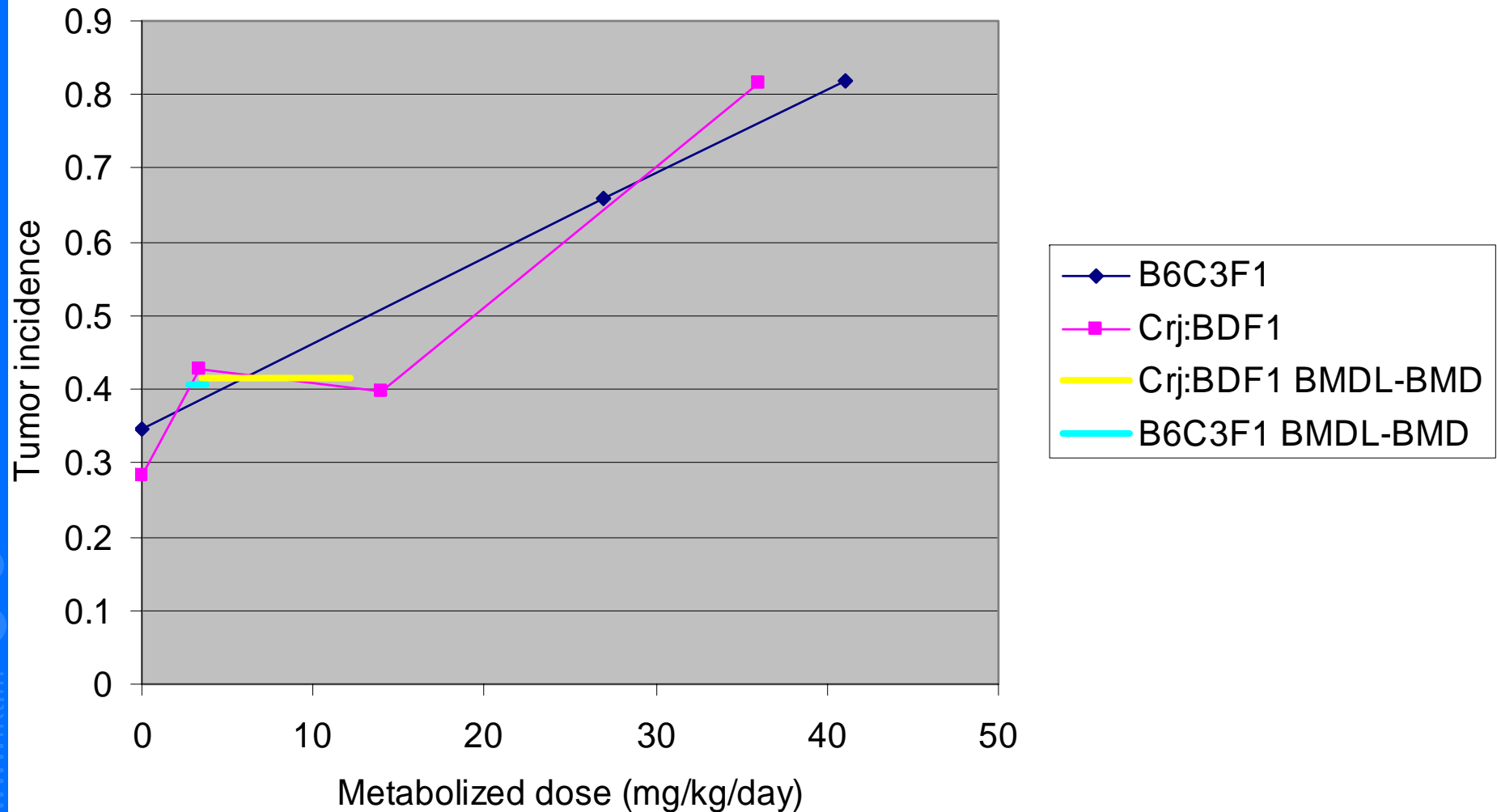
# Frambozadrine



# Questions to be studied (frambozadrine)

- Do we need separate DR relationships for males and females?
  - Study: We do not need separate DRs
  - Jouni: If the target population Pop is "rats", then we MUST pool
    - This is NOT a question of statistical deviance

# Parsimonate: mice data sets



# Conclusions

- We should use statistical methods that reflect our understanding of physiological reality
- We should be very concerned if conventions or statistical limitations deviate us from this goal