

RREL

IRGC 2006 CONFERENCE

The Risk Governance of Nanotechnology

- Closing Session -

7 July 2006

Michael D. ROGERS

BACK TO BASICS – RISK ASSESSMENT (1)

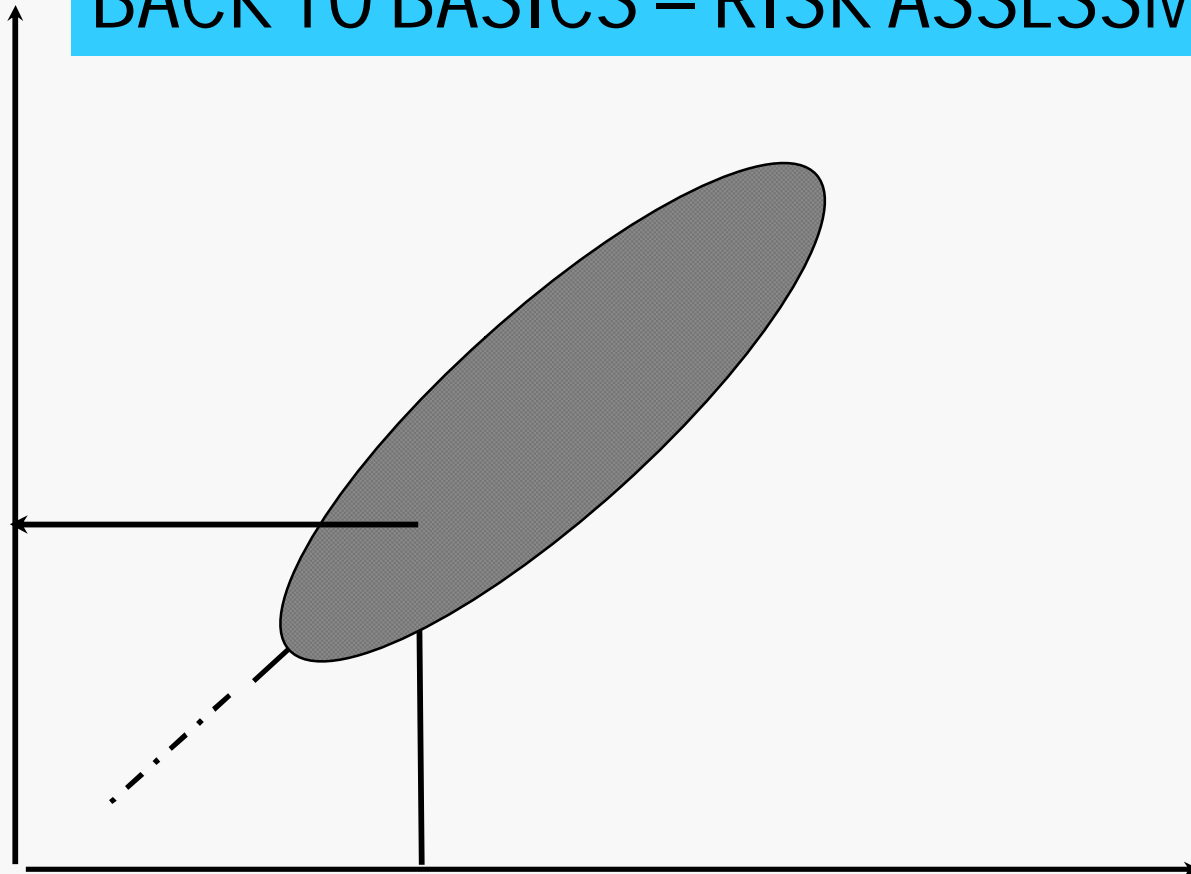
IRGC: 3 COMPONENTS (RISK GOVERNANCE – WHITE PAPER)

- 1) An Identification and, if Possible, Estimation of Hazard**
- 2) An Assessment of Exposure and / or Vulnerability**
- 3) An Assessment of Risk, Combining the Likelihood and the Severity of the Targeted Consequences based on the Identified Hazardous Characteristics and the Exposure / Vulnerability Assessment**

NB Hazards Describe the Potential for Harm

BACK TO BASICS – RISK ASSESSMENT (2)

Probability of a Particular Harm, $P(\text{Ha})$



Exposure to a Given Hazard, $I(\text{Hz})$

UNCERTAINTY OF [HH] RELATIONSHIP

HARMS



UNCERTAIN RELATIONSHIPS

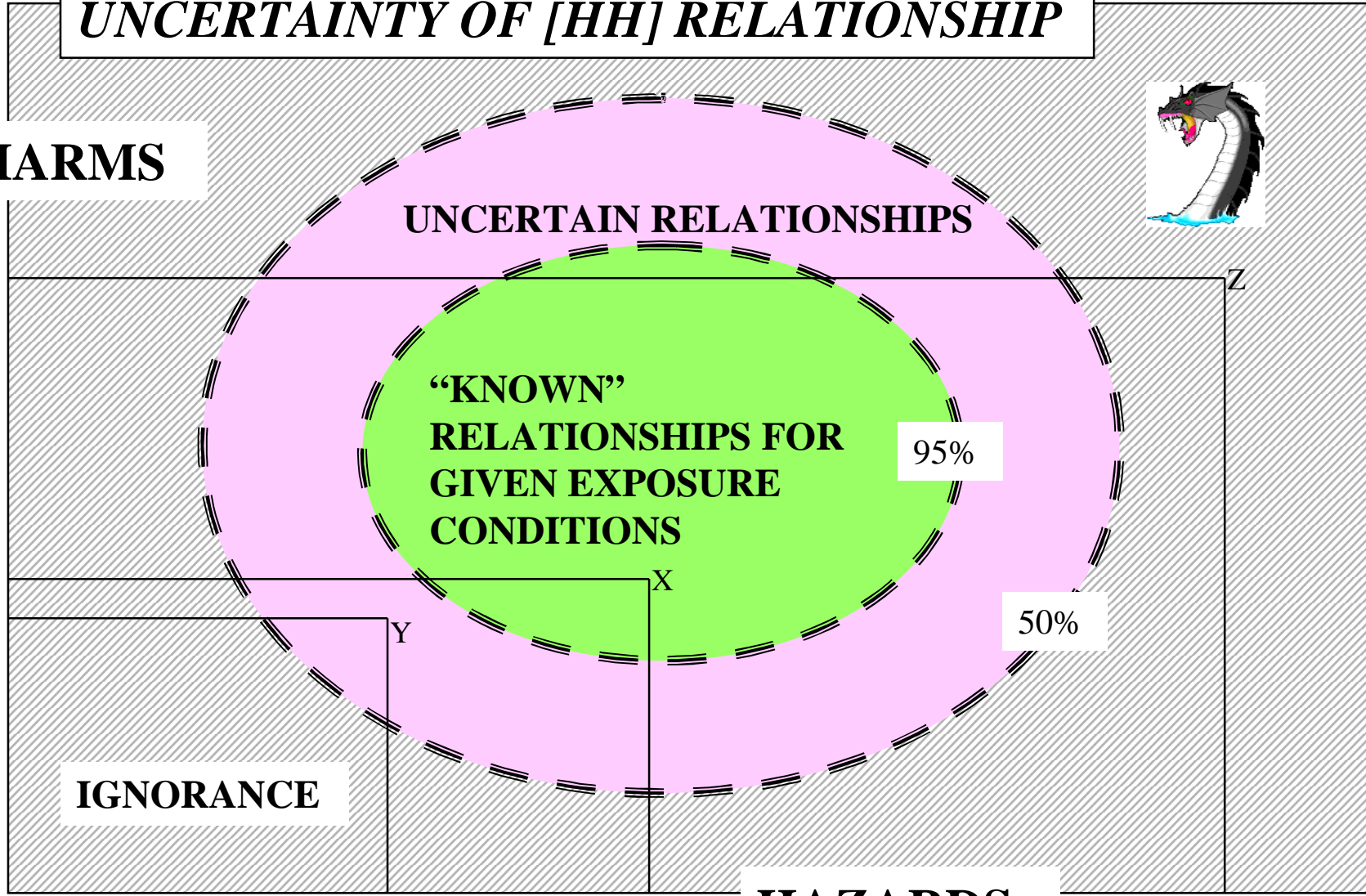
**“KNOWN”
RELATIONSHIPS FOR
GIVEN EXPOSURE
CONDITIONS**

95%

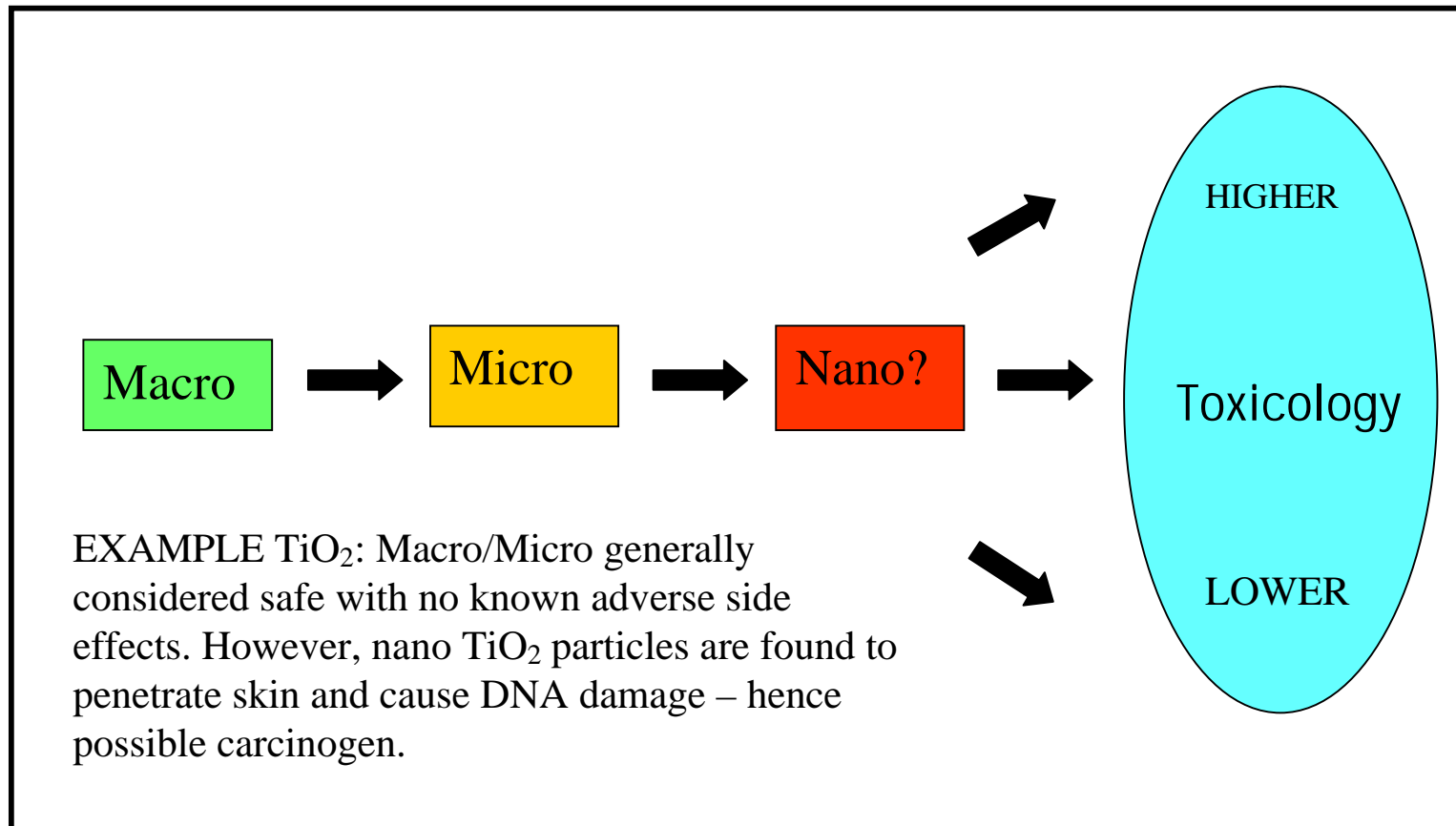
50%

IGNORANCE

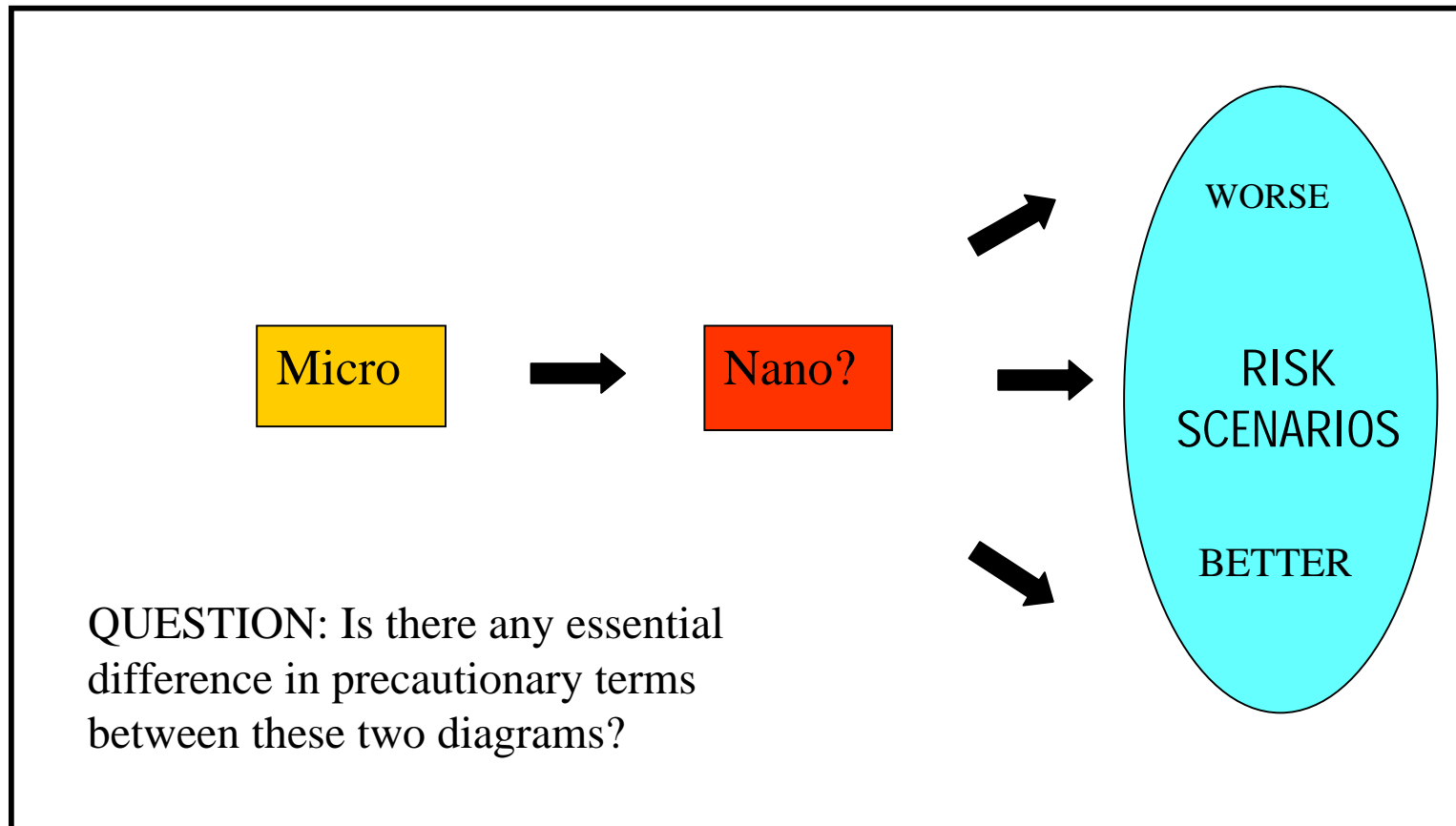
HAZARDS



PASSIVE NANO STRUCTURES



ACTIVE NANO STRUCTURES



The Commission and Precautionary Action

1. The PA should be PROPORTIONAL
2. The PA should be NON-DISCRIMINATORY
3. The PA should be CONSISTENT
4. The PA should be based on an examination of the COSTS and BENEFITS of action.
- 5. The PA should be subject to REVIEW in the light of new scientific data.**

NB: The Fifth Criteria for Precautionary Risk Management Action is the Key Criteria

Precautionary Research

**The Fifth Criterion Translates into a Requirement for
Precautionary Research**

Or if you prefer

Pre-Regulatory Research

This should have been highlighted in the White Paper

NB: The EFSA & OECD Emerging Risks Exercises

CF: The BST Regulatory Saga.

**“It is a poor sort of memory
that only works backwards.”**

**The Red Queen in “Alice in
Wonderland” by Lewis Carroll**

NANO-ETHICS and VALUES

RANKING VALUES

- 1) Freedom of Research**
- 2) Economic Growth**
- 3)**
- 4)**
- 5)**
- 6) Safety and Security**
- 7) Integrity**

RANKING VALUES

- 1) Integrity**
- 2) Safety and Security**
- 3)**
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- 6) Economic Growth**
- 7) Freedom of Research**

**There are no absolute value rankings,
just a system of trade-offs and balances.**

The Ethical Issues at Stake:

What Sort of Society Do we Want our Children and Grandchildren to Grow up in?

SOME ETHICAL ISSUES

Risk-Benefit Assessment:

Information and Consent:

Equity and Fairness:

Insurance:

Trust and Transparency:

SOME ETHICAL PROBLEMS

Enhancement:

Privacy and Surveillance:

Who bears the Risk and Who takes the Benefit?

Communication:

C.F. The KBF Meeting of Minds Project