Some Thoughts
On
Decontamination
(... That Also May Apply To Protection and Detection ...)

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Understanding Our Complex World . . .
(and the challenges we mere mortals face)

Dear Dr. Science,
-I hear that scientists have now made anti-hydrogen...

My question is: if you mixed anti-hydrogen with anti-oxygen, could you make anti-water?

If so, could it be used to start fires, rather than put them out?

Yours,
Curious Sam.

Hmmm...

Dear Curious Sam,
-unfortunately, Dr. Science is currently unable to provide a response to your recent query.

I think your question might have hurt his brain.
The Challenge For Me . . .

“With the advent of globalization some would speculate that national and international conflict along with terrorism will diminish. On the contrary, the inherent tension between national interests, global economic stability or instability and ethnic distrust will lead to an increase in potential conflict scenarios. Global security, national security, homeland security, and, interestingly enough energy security, will be the moderating factors that will reduce the potential flash points. The underpinning of each is science - today’s and tomorrows.”

Congressional Hearings – October 2005
Decon Was Hard To Do In Yesterday’s World . . .

Multiple scientific and technical disciplines

Analysis, S&T, and operations

Threats, R&D, prototypes, and products

Global Security
Muti-Service Perspectives on Decon

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<td>Manipulation of macromolecular properties to achieve optimal performance</td>
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<td>Biologically based fabrication of advanced electronic, magnetic, and optical materials</td>
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**“Investment is Not Uniform”**

**“Few Initiatives Planned”**

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**FLTC 3.2: Locate, ID, Engage and Neutralize CBRNE Threats**

**Army**

**Air Force**

**My Evaluation**

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**Near Term (08-12)**

**Neutralization**

Stable biomolecule encapsulation (multi-months, non-refrigerated)

Multifunctional encapsulation

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**Mid Term (13-16)**

**Neutralization**

Stable counter-bio agent with 5-logs of deactivation of BWA

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**Far Term (17-25)**

**Neutralization**

Self replicating, counter-BWA organisms
Detection, Protection and Decon Are Inter-Related (Big Surprise?) . . .

But Fundamentally Are Solved Independently . . .

Principal component analysis reveals that each agent produces a unique response signature (colored tracing)

Global Security

Our approach is to characterize millions of individual virions in picoliter volume microreactors

And Are Incongruent With Respect to Time Scales . . .
We Are Pretty Good as a Nation at Intel Analysis, Threats and Predictions . . .

But We Don’t Integrate Well Across Departmental Boundaries and Equities . . .
Can “Big Science” Be Use To Solve Our Technology Challenges? . . .

Yes . . . But . . .

Nano-Scale Science

Non-Nuclear Fusion

Tera, Peta, Exta Scale
High Performance Computing

Global Security

We Must Breakdown The Barriers . . .
But We Don’t Do Well At R&D and Using a Multi-Disciplinary Approach to Solutions . . .

### Yesterday
- Slide Rule and Manuals
- Threat Assessment
- Service Specific Solutions and R&D
- A Military Problem
- Risk Avoidance
- Liquid Based Decon

### Today
- Cluster and High Performance Computing
- Threat Analysis
- Inter-Service, Inter-Agency R&D??
- A Global Problem??
- Risk Management??
- Novel Decons??
Some Closing Thoughts . . .

“If we knew what it was we were doing, it wouldn’t be called research, would it?”

*Albert Einstein*

“Those who say it cannot be done should not interrupt the person doing it.”

– Chinese Proverb

“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.”

– Charles Darwin

“All I’m saying is, now is the time to develop the technology to deflect an asteroid”
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