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Minimizing the bioterrorist threat: Fear, fancy, folly, and physics

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There can be little doubt that a bioterrorist attack represents one of the most significant dangers facing the Nation today. It is cheap, relatively easy to use, and can produce huge casualties and significant financial losses. Because of its apparent simplicity, there has been a great amount of attention directed towards developing means for early detection of an attack in progress. Most developmental funding for protective strategies comes from the Federal government: DoD is focused on protecting the military (personnel and facilities) whereas DoHS is most concerned with civilian response (police, triage, epidemiology, cure). Associated with such activities are some pretty amazing ideas both concerning the threat and means to detect its presence. These include the belief that certain bioterrorist attacks could equal the consequences of a nuclear weapon, that crop dusters with the proper agents could wipe out a city, that if it “glows” (i. e. is fluorescent) it must be an agent, or even that gravitational forces are actually far greater than believed. From the early warning side of things, the huge costs associated with a false positive call have resulted in the generally recognized need to identify before any alarm is triggered. Some consequences of this strategy have been the development of so-called smart chips and even handheld mass spectrometers! A brief review of some of these devices and the physics required for their success is discussed. An approach based upon some simple features of inverse scattering theory is proposed whereby identification may be unnecessary.