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Subject: PRO> Anthrax, human, 2001 - USA (08): spore characteristics

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ANTHRAX, HUMAN, 2001 - USA (08): SPORE CHARACTERISTICS

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<http://www.omicsonline.org/ArchiveJBTD/ArticleinpressJBTD.php>

<http://www.omicsonline.org/2157-2526/2157-2526-S3-001.pdf>

ME Hugh-Jones, BH Rosenberg, S Jacobsen, 2011. The 2001 anthrax attack: Key observations. Journal of Bioterrorism & Biodefense, Special Issue 3, 2011, <http://dx.doi.org/10.4172/2157-2526.S3-001>

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Abstract

Unresolved scientific questions, remaining 10 years after the anthrax attacks, 3 years after the FBI accused a dead man of perpetrating the 2001 anthrax attacks single-handedly, and more than a year since they closed the case without further investigation, indictment or trial, are perpetuating serious concerns that the FBI may have accused the wrong person of carrying out the anthrax attacks. The FBI has not produced concrete evidence on key questions:

- Where and how were the anthrax spores in the attack letters prepared? There is no material evidence of where the attack anthrax was made, and no direct evidence that any specific individual made the anthrax, or mailed it. On the basis of a number of assumptions, the FBI has not scrutinized the most likely laboratories.

- How and why did the spore powders acquire the high levels of silicon and tin found in them? The FBI has repeatedly insisted that the powders in the letters contained no additives, but they also claim that they have not been able to reproduce the high silicon content in the powders, and there has been little public mention of the extraordinary presence of tin. All the available evidence can be explained by the hypothesis that the spore coats were silicone-coated using a tin catalyst. Chemical details are presented here.

- Where did the anthrax spores become contaminated by a rare strain of *B. subtilis*? The FBI never located the source of the strain, but they never searched in the most likely places.

Once the method of preparation of the attack anthrax is understood, the questions of who made it, and where, will be rapidly resolved. The publicly-known evidence related to these questions is compiled here, with full documentation.

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[The attack anthrax spores have been found to contain silicon, oxygen and tin on the surface of the spore coats, unlike normal anthrax spores. Because tin is toxic, and is present in substantial amounts, it must have been added after the spores were grown. Although silicon occasionally occurs naturally on the spore coats of anthrax spores, the amount of silicon on the attack spore coats was much greater than that on other spores, even those with the highest amounts, which implies that silicon may also have been an additive. The elements present on the spore coats suggest that the spores may be silicone-coated. Tin is a catalyst for cross-linking silicone polymers. The small, silicon and oxygen-containing molecules that react to form the polymerized coating can pass through the outer membrane of the spore (the exosporium) to reach the spore coat, where moisture is present to complete the reaction.

Unlike the anthrax powders in the Senate letters, the powders in the earlier attack letters were impure and contained cellular debris, which could also react with the additives; as a result, the bulk NY Post letter powder has a much higher silicon and tin content than the bulk Senate powders. Put another way, 2 separate preparations were used. This is reinforced by the finding of the *B. subtilis* contaminant in the coarse powder but not in the finer, nor in the presumed source flask RMR 1029.

Microencapsulation with silicone has been used to confer high stability on biologicals, protecting them from environmental hazards, not a property relevant to their use in the letter attacks, but of interest to bio-defense. (The assumption that additives must necessarily be related to dispersibility does not necessarily apply in the case of anthrax spores, which are surrounded by the exosporium.) If the attack spores were microencapsulated, they were probably made for some purpose other than letter attacks. For example, DARPA's project on CBW detection was planning to look at microencapsulated pathogens in 2001. - Mod.MHJ]

## See Also

Anthrax, human, 2001 - USA (07) [20111010.3034](#)  
Anthrax, human, 2001 - USA (06): comment [20110914.2798](#)  
Anthrax, human, 2001 - USA (05): possible chronic symptoms [20110913.2788](#)  
Anthrax, human, 2001 - USA (04) [20110721.2203](#)  
Anthrax, human, 2001 - USA (03): more questions [20110521.1545](#)  
Anthrax, human, 2001 - USA (02): ongoing questions [20110223.0601](#)  
Anthrax, human, 2001 - USA: Nat'l Research Council rep. [20110216.0511](#)  
2010  
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Anthrax, human, 2001 - USA (06) [20100921.3407](#)  
Anthrax vaccine, human - USA: new recommendations [20100727.2514](#)  
Anthrax, human, 2001 - USA (05) [20100424.1326](#)  
Anthrax, human, 2001 - USA (04) [20100324.0933](#)  
Anthrax, human, 2001 - USA (03) [20100305.0727](#)  
Anthrax, human, 2001 - USA (02): FBI case closed [20100219.0575](#)  
Anthrax, human, 2001 - USA [20100125.0281](#)  
.....mhj/msp/sh

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