

Falsified Explanation, Mechanism and Data from Sterrad[®], Plasma Cluster[®] and Nano-E[®]

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Sterrad[®] is commercial available from J&J in USA and J&J reported that Sterrad[®] has an ability to sterilize microorganisms by gas plasma. Gas plasma include reactive oxygen such as OH radicals [1-3]. However, as shown in Figure 1 gas plasma exposed before and after hydrogen peroxide (H₂O₂) injection and sterilization, this means sterilization is done only by H₂O₂. In that sense, gas plasma did not contribute to sterilization, indicating inactivation is by only hydrogen peroxide, not by gas plasma. In addition, recently it was reported that Sterrad[®] can inactivate abnormal prion, but it is not true because prion is the most tolerable substance among targets of inactivation (Table 1). In that sense, hydrogen peroxide may contribute for disinfection, but not for sterilization and prion inactivation. The order of the toughness of inactivation is prion inactivation>sterilization>disinfection>preservation [2]. The difference of sterilization and disinfection is whether it has the ability to destroy bacterial spores [2]. Sterilization has an ability to destroy bacterial spores.

As a next subject we will discuss about Plasma Cluster[®] from Sharp in Japan and NanoE[®] from Panasonic in Japan. They commercialized that air purifiers are installed plasma generator and commercialized to destroy airborne microorganisms and air dust by reactive oxygen such as OH radical from gas plasma. The mechanism is explained by OH radicals from plasma by Sharp Co. Ltd, but the life period of OH radical and the flight distance of OH radical are a few μs and 30 cm for 10⁻² s, respectively [3], this indicates that OH radicals cannot flight the normal room for human being. In exact, the tested area done by Sharp and Panasonic Co. Ltd is quite small like doghouse. Furthermore if their proposal might be correct, OH radical can attack to airborne microorganisms, airborne viruses as well as human beings in the room, indicating safety concern of human being can be maintained. Anyhow human beings exposed to Plasma Cluster[®] and NanoE[®] have not been reported any damage to human skin or human lung so far. This is because Plasma Cluster[®] and NanoE[®] have no or little capability of destroying airborne microorganisms, airborne viruses and airborne dust. These phenomena have already claimed by several persons but Sharp and Panasonic Co Ltd do not respond scientifically. Furthermore, Ministry of Health, Labor and Welfare in Japan and Consumer Affairs Agency in Japan have no positive activity to J & J in Japan and Sharp Co. Ltd and Panasonic Co Ltd in Japan. Also FDA in USA does not regulate anything to Sterrad[®] from J&J in USA.

	Microorganism	Examples
	Prions	Scrapie, Creutzfeldt-Jakob disease, chronic wasting disease
	Bacterial spores	<i>Bacillus</i> , <i>Geobacillus</i> , <i>Clostridium</i>
	Protozoal oocysts	<i>Cryptosporidium</i>
	Helminth eggs	<i>Ascaris</i> , <i>Enterobius</i>
	Mycobacteria	<i>Mycobacterium tuberculosis</i> , <i>M. terrae</i> , <i>M. chelonae</i>
	Small, nonenveloped viruses	Poliovirus, parvoviruses, papillomaviruses
	Protozoal cysts	<i>Giardia</i> , <i>Acanthamoeba</i>
	Fungal spores	<i>Aspergillus</i> , <i>Penicillium</i>
	Gram-negative bacteria	<i>Pseudomonas</i> , <i>Providencia</i> , <i>Escherichia</i>
	Vegetative fungi and algae	<i>Aspergillus</i> , <i>Trichophyton</i> , <i>Candida</i> , <i>Chlamydomonas</i>
	Vegetative helminths and protozoa	<i>Ascaris</i> , <i>Cryptosporidium</i> , <i>Giardia</i>
	Large, nonenveloped viruses	Adenoviruses, rotaviruses
	Gram-positive bacteria	<i>Staphylococcus</i> , <i>Streptococcus</i> , <i>Enterococcus</i>
	Enveloped viruses	Human immunodeficiency virus, hepatitis B virus, herpes simplex virus

Table 1: Microbial resistance to biocides and biocidal processes. From this prion is the most tolerable to biocides and the next is bacterial spores and only inactivation spores can be called sterilization.

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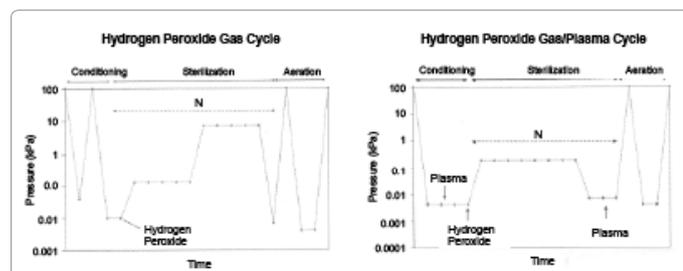


Figure 1: Hydrogen peroxide gas sterilization in left and sterilization by Sterrad in right. From the Figure, plasma is not applied to hydrogen peroxide gas and it was applied before and after hydrogen peroxide gas injection, indicating sterilization by Sterrad is only by hydrogen peroxide gas. Hydrogen peroxide gas has no ability to inactivate abnormal prion.

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