

Reinventing Sterilisation

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Sterilisation is key in the medical field:

- Disposable / Reusable products manufacture
- Medical Equipment
- Parts of medical devices

2 Main Methods:

- Physical: Heat
- Chemical: Liquids, Gas, Plasma

Heat Methods:

- Dry Heat (Convection Stoves)



- High Pressure Steam (Autoclave)

Chemical Methods:

- Liquids: Hydrogen Peroxide, Formaldehyde, Peracetic Acid
- Gas: Ethilene Oxide, Formaldehyde Vapor
- Plasma: Hydrogen Peroxide

Problems:

- Very Slow (hours)
- Involve toxic/carcinogenic substances
- May damage the equipment
- Expensive
- Resistant Microorganisms

THERE IS ROOM FOR IMPROVEMENT

LIGHT-BASED SOLUTIONS SHOULD BE EXPLORED

First Proposal: UV-Emitting Fluids

- Light is sterile
- UV destroys all kind of microorganisms
- Fluids can reach everywhere
- May work at low temperatures

Second Proposal: Extended Selective Thermolysis

- Selective destruction by heat diffusion
- May include non-linear effects (Optical Breakdown)
- Does not require toxic substances
- Limited to heat-resistant materials

Side Note: Raman Spectroscopy for Quality Check

