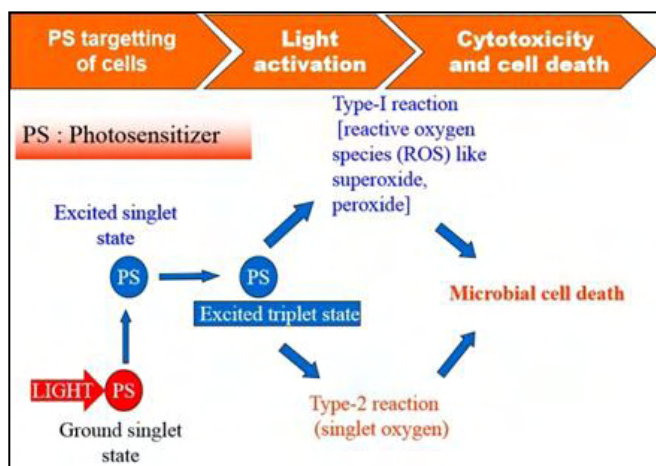


N.2: Incubation for development of antimicrobial photodynamic therapy device with organ-specific applications

At RRCAT, studies on antimicrobial photodynamic therapy (APDT) are being carried out. These studies are an offshoot of photodynamic therapy (PDT) meant for treatment of tumors. APDT involves incubation of light activable drugs called photosensitizers (PS) with microorganisms for a suitable duration followed by exposure to visible light of suitable wavelength. The ensuing photochemical reactions rapidly generate reactive oxygen species, which cause damage to multiple biomolecular targets within microbial pathogens. The distinct advantage of APDT is that there is least chance of development of resistance.



A flow chart depicting antimicrobial photodynamic therapy (APDT).

In the last half decade, our investigations have been focused on APDT mediated inactivation of antibiotic sensitive and resistant bacteria using either cationic PS or cationic peptide conjugated anionic PS (chlorophyll derivative). These investigations have suggested that a suitable APDT window can be optimized that result in ~99% bacteria load reduction, with concomitant increase in healing response of wounds. In addition to antibacterial applications, we have recently forayed into APDT mediated inactivation of fungi and viruses, notably SARS CoV-2. Propelled by these interesting and encouraging results, we have come up with the idea of developing first-of-its-kind in India “APDT device with organ specific attachments”. These hand-held point of care devices are meant for treatment of infections of external nares (nasal cavity), oral cavity, acne and wound infections in diabetic individuals, subjects undergoing chemo/ radiotherapy, immunocompromised human subjects etc., to name a few. RRCAT and Dr. Cure and Care, New Delhi signed a collaborative incubation agreement to develop these technologies.



Representative of M/s Dr. Cure and Care, New Delhi collecting document of incubation agreement from Dr. S. V. Nakhe, Director, RRCAT.

Efficacies of these devices plus our customized PS formulations have been tested against various antibiotic resistant microbes under laboratory settings. Further studies in clinical settings are being carried out.

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N.3: Incubation Centre-RRCAT offers services of electron beam radiation processing facility to Indian industries

Electron beam radiation processing facility (EBPF) set up near Choithram Mandi, Indore is based on two indigenously developed 10 MeV, 6 kW electron linear accelerators (Linacs).



Electron beam radiation processing facility (EBPF) set up near Choithram Mandi, Indore.