MITOCHONDRIAL PHOTO FIELD-EFFECT TRANSISTOR: The biological photo-FET model provides an intuitive explanation to the discovery that the frequencies 750 and 950 nm reduced the activity of COX (via inhibition of the reaction of CYTc and COX) and limited ROS generation in irradiated brains. The model explains the recovery of pigs 13.5 minutes post cardiac arrest, resuscitation and irradiation of the foreheads for 2 hours with an intensity of 2W/cm² at 950 nm.

**APPLICATIONS**: treatment of diabetic ulcers, dementia, depression, stroke, TBI, peripheral neuropathy, retinal disorders, oral mucositis, burns, inflammatory processes, infertility, cosmetic surgery. In viral infections LLLT can be used to upregulate the immune system, kill viruses and help cells to get rid of internal amyloid-β deposits. Except for the antiviral action, the therapeutic effects are explicable via ATP upregulation in mitochondria.

MITOCHONDRIAL SOLAR SENSITIVITY: There are 2 pronounced minima in the R-NIR sector of the spectral solar irradiance, at 750 and 950 nm. During evolution mitochondria were not exposed to light except the sun. The simplest argument is that the mitochondrial photo-FET apparatus had no opportunity to adapt to these wavelengths. It is plausible that lack of adaptation to 750 and 950 nm results in a stronger perturbation of the H₂O barrier than to-FET apparatus had no opportunity to adapt to these wavelengths. It is plausible that lack of adaptation to 750 and 950 nm results in a stronger perturbation of the H₂O barrier than.

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HERPES LABIALIS: NO MORE CREAMS

Infection with HSV-1 is suspected to be a risk factor in the formation of Alzheimer’s disease. Irradiation of the affected area at the time of the manifestation of the first symptoms with 650 nm laser light (2 W/cm²) for 5 min, twice a day for 2 consecutive days, prevented the outbreak. Assumption: the virus was killed by mitochondrial ROS, triggered by the high laser intensity.

COVID-19 COULD TRIGGER ALZHEIMER’S

During a severe infection with all the lead symptoms of Covid-19, LLLT has been used to treat a painful frontal sinusitis. Could LLLT be extended to treat further manifestation of Covid-19? Recently, Ezzat et al. identified the viral protein corona as a critical factor for viral–host interactions and showed that that respiratory syncytial virus (RSV) and HSV-1 accumulate a protein corona in biological fluids, and that HSV-1 triggers amyloid-β aggregation. Possible involvement of SARS-CoV-2 in the etiology of Alzheimer’s disease is sufficient motivation for further research efforts: While the moderate light doses used in LLLT are instrumental to support the immune defense via ATP upregulation – as could be useful in Covid-19 – ROS generation via higher light doses based on higher intensities could be used to destroy the corona virus, in this case using pulsed light to prevent overheating and by avoiding the wavelengths 750 and 950 nm – shield and sword against SARS-CoV-2.