Research Article

Trends in General Medicine

S.A.R.S Cov-2 Spike Protein Derivates – Graphene And Wireless Comunications Radiation: Epidemiological-Chemico Physical And Toxicological Aspects -Scientific Evidence

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ABSTRACT

Aim of this work is to search and analyze scientific literature involved in the effect played by wireless comunication radiation in the S.A.R.S-COV-2 spike protein derivates pathological process.

This make possible to verify if it is necessary to be considered as a toxicological co-factor Various published evidence finded graphene impurity in vial some COVID-19 vaccine (P. Campra) or in vaccinated blood.

But It is relevant to deeply investigate this phenomena using only scientifc evidence. Crucial also to verify the subpopulation distribution of pathological event in vaccinated like pericarditys or central nervous system thrombosys as well as the use of some technological tool like smartphone in the various age classes. This method make possible to generate hypotesys to be better verified. In this work is used a neutral approch without pre-concept.

Keywords

Wireless communications radiation [WCR], Spike protein, ACE, Temperature, Pathology toxicology, Epidemiology, Publich health, COVID-19 vaccine.

Introduction

Great part of the pathological effect of the COVID-19 disease is due by the interaction of the S.A.R.S cov-2 SPIKE Protein with the ACE 2 receptor and related cellular intake.

(Mainly y pulmonary inflamation and coagulopathy, great increase in inflamatory molecule since ARDS and fibrosys: comorbidity and age > 50 years produce the more severe effect as reported in literature).

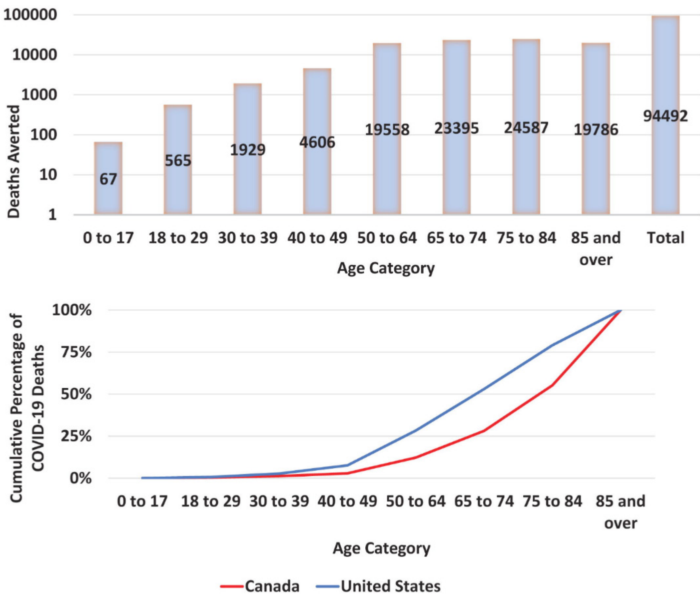

Figure 1: The Cumulative counted COVID-19 deaths CD averted in Canada as of May 2022 by outperforming the US pandemic response. (A) Absolute deaths AD averted, by age group and overall; note log scale. (B) Cumulative proportion of deaths by age group in Canada, and with a Canada-standardized US pandemic response. Estimates are based on direct standardization like described in ref. 2; death data are from refs. 22 and 25.

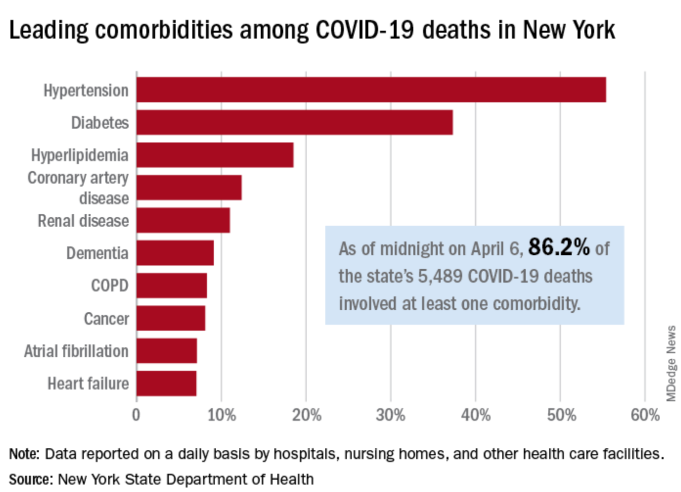

Figure 2: https://www.the-hospitalist.org/hospitalist/article/220457/coronavirus-updates/comorbidities-rule-new-yorks-COVID-19-deaths.

Of great interest to verify in scientific literature epidemiology (histograms) of some characteristic event related COVID-19 disease or Vaccination: pericarditys / myocarditis and CNS thrombosis (rare in some vaccinated).

"An increased risk of myocarditis / pericarditis was observed after COVID-19 mRNA vaccination and was highest in men aged 18-25 years after a second dose. The incidence was rare."

And in article is reported: Comparative Study Vaccine. 2022 Jul 30;40(32):4663-4671. doi: 10.1016/j.vaccine.2022.05.048. Epub 2022 May 25. Myocarditis and/or pericarditis risk after mRNA COVID-19 vaccination: A Canadian head to head comparison of BNT162b2 and mRNA-1273 vaccines.

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"The risk of myocarditis and/or pericarditis is higher after mRNA-1723 vaccination than the BNT162b2 vaccination in those aged 18-39 years, especially in males aged 18-29 years, where the risk is several times higher."

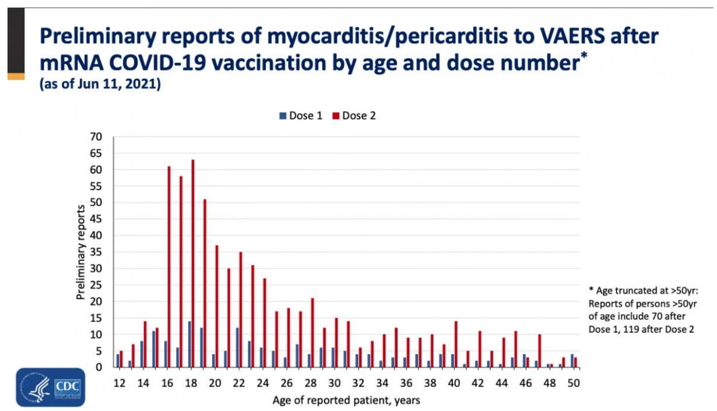

Figure 3: form https://www.dicardiology.com/article/overview-myocarditis-cases-caused-COVID-19-vaccine.

Also of great interest is to verify the distributionby age class in the use of smarthphone:

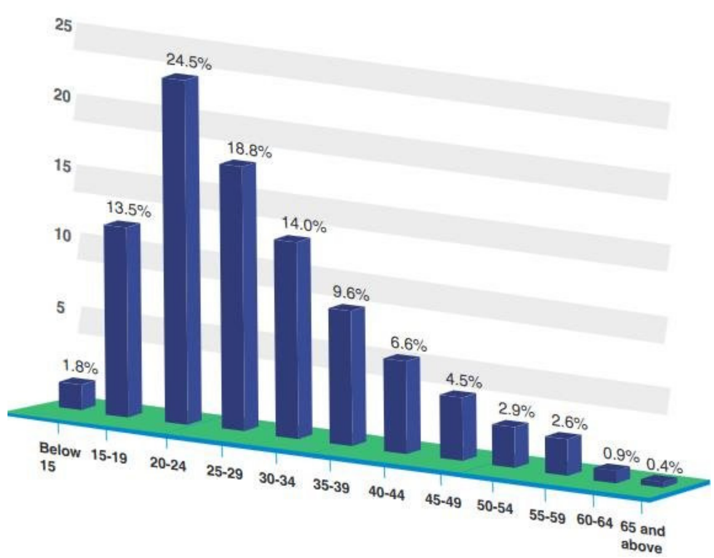

Figure 4: Percentage of Smartphone Users by Age Category from DOI: 10.1088/1757-899X/226/1/012115.

And observing: 24 March 2021 EMA/PRAC/157045/2021 Pharmacovigilance Risk Assessment Committee (PRAC) Signal assessment report on embolic and thrombotic events (SMQ) with COVID-19 Vaccine (ChAdOx1-S [recombinant]) – COVID-19 Vaccine AstraZeneca (Other viral vaccines).

"A combination of blood clots BC and low level of platelets PTL , in some cases together with bleeding, has been observed very rarely following vaccination with the COVID-19 Vaccine AstraZeneca.

This included some severe cases with blood clots in different or unusual locations and excessive clotting or bleeding throughout the body. The majority part of these cases occurred within the first 7 to 14 days following vaccination and mostly occurred in women under 55 years of age, however, more women under 55 received the vaccine than other people. Some cases had a fatal outcome".

Table 1: from 24 March 2021 EMA/PRAC/157045/2021 Pharmacovigilance Risk Assessment Committee Signal assessment report on embolic - thrombotic events (SMQ) with COVID-19 Vaccine (ChAdOx1-S [recombinant]) – COVID-19 Vaccine AstraZeneca (Other viral vaccines).

Embolic and thrombotic events	IR per 100,000 Person years From ARS	EEA		
		Expected 14d	Observed 14d From EV	OE 14d with 95% c.i.
20-29	40.14	2.88	11	3.82 (1.91 - 6.84)
30-49	85.08	60.95	79	1.30 (1.03 - 1.62)
50-59	200.73	96.89	40	0.41 (0.29 - 0.56)
60-69	427.56	168.22	33	0.20 (0.14 - 0.28)
70-79	912.00	90.40	5	0.06 (0.02 - 0.13)
80+	2,055.95	158.30	8	0.05 (0.02 - 0.10)
Total		**577.64**	**182**	**0.32 (0.27 - 0.36)**

Related the need to verify if there are or not relationship between this factors it is crucial to perform a review of scientific work published by reveiwer boards about this topic.

After this phases is submitted to the researcher an experimental project hypotesys in order to produce a global conclusion.

"The host-cell receptors for S.A.R.S-CoV and MERS-CoV are ACE2 and DPP4 respectively . Recent advances in cryo-electron microscopy characterization of the spike protein revealed that the R.B.D.s adopted at least 2 distinct conformations. **R.B.D. can be either in the open or in the closed position (called up or down** conformation respectively).**In the up conformation, the R.B.D. jut out away from the rest of S, such that they can easily bind with the ACE2**. In the down conformation the R.B.D.s are tightly packed, preventing binding by ACE2. The receptor-binding event may trap the R.B.D. in the less-stable up conformation, leading to destabilization of S1,triggering conformational change of S2 from prefusion to postfusion state and initiating the membrane fusion. The S.A.R.S-CoV cell entry also depends on transmembrane protease serine 2 which help to cut S to units S1 and S2.A theory on the conformation transition for S.A.R.S-CoV-2 spike protein (S) is proposed. **The conformation equilibrium between open (up) and closed (down) conformations of receptor binding domain** of the spike P is studied from the first-principle. The conformational state population is deduced from the free energy change in conformation transition of SPIKE protein. We demonstrated that the free energy includes 2 parts, one from the multi-minima of conformational potential and another from the variation of structural elasticity.

Both factors are dependent of amino acid AA mutation. The former is related to the change of affinity of R.B.D. to ACE 2 due to the mutation in the subdomain RBM (receptor binding motif) of R.B.D.. The latter is caused by the change of elastic energy of SIPKE protein. When the affinity has increased significantly and/or the elastic energy has been reduced substantially the equilibrium is biased to the open conformation. Only then can the virus infection process continue. Possible new S.A.R.S-CoV-2 variants from AA mutations in 5-9 sites on R.B.D. interface are predicted. The elastic energy variation needed for conformation transition is estimated in quantitatively way. Taking the elastic-structural change into account more virus variants are possible. Both the D614G mutation, the K986P mutation and the new variants 501Y in current S.A.R.S-CoV-2 pandemic can be interpreted by the presented theory. The comparison of the infectivity of S.A.R.S-CoV-2 with S.A.R.S-CoV-1 is made from the point of conformation equilibrium. Why the virus entrance takes priority in lower temperature and higher humidity is interpreted by this present theory. The conformational transition influenced by electromagnetic field is discussed.

As in Figure reported there is a potential barrier between 2 conformations. The transmission coefficient is dependent of the height and width of the potential barrier. Introducing an electric field will change the conformational barrier of the spike P effectively and in turn change the conformational state population. **It was reported that as the electric field increases beyond 0.02 au, the net electron density starts to move from C-H bond towards the carbon C, causing the bond to begin to weaken and lengthen. The static electric field of appropriate strength and direction can break some H-bond and salt bond in the spike and changes the conformation equilibrium of R.B.D..**The geomagnetic field can effectively block the bombardment of high-energy charged particles in the cosmic ray. Due to the abnormal macula activity the weakened geo-magnetic field would make the spike susceptible to bombardment, causing the residue deletion or mino acid mutation and changing the conformational state population."

Material and Methods

With an observational methods various relevant reference related the argument of investigation are reported and the analyzed.

All literature comes from scientific database like PUBMED and other.

Various images, tables and other data are reported to help in this evaluation After this an experimental project hypotesys is submitted

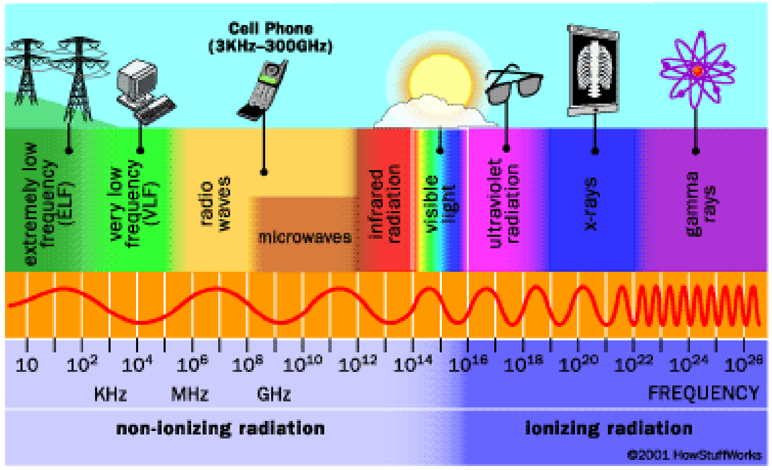

Figure 5: Form https://www.mobilesafety.com.au/cell-phone-radiation/.

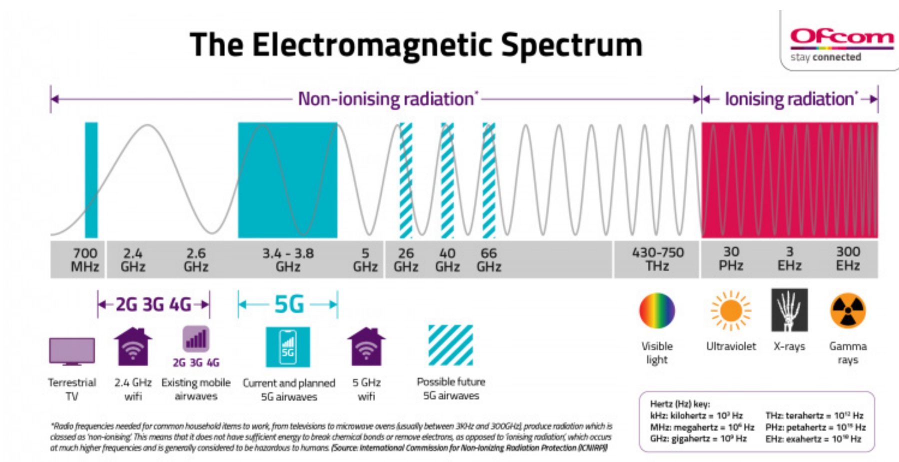

Figure 6: From newscentre/smart-living/everything-you-need-to-know-about/5g-and-health-everything-you-need-to-know/.

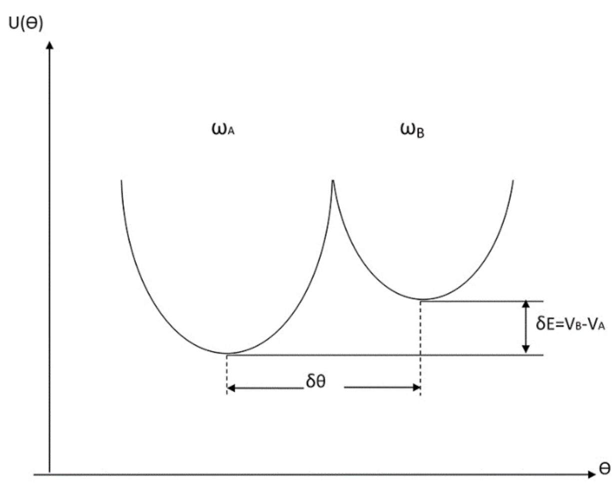

Figure 7: From Luo L, Zuo Y : Eq (1) describes the conformation transition of R.B.D.. The closed/open transition of R.B.D. proceeds in 2 directions the equilibrium of which determines the first step of the viral infection. We shall study the conformation equilibrium between **R.B.D.(closed) and the R.B.D.(open). Suppose A denotes closed conformation and B open conformation. The Gibbs free energy is expressed by the GA and GB respectively** in 2 conformations.If GA is lower than the GB, then S1 takes inactive conformation 2 minima separated by **a potential barrier represent 2 conformations** A (left) and B (right) of R.B.D., 9 is conformational coordinate, ω – the frequency parameter and I – the inertia parameter describing the vibration around the minimum. The molecule may located in conformation A or B. The conformational state population is determined by 1 factors: the conformational energy Econf=VB-VA an d the elastic energy Eelas=kBTlnYA/B. The elastic energy is related to the frequency-ratio ωB/ωA or frequency-difference ωB-ωA. As VA<VB, A is the advantageous conformation if elastic energy EE can be neglected (ωB≅ωA. when ωB is much smaller than ωA the contribution of elastic energy is important and it can make the population conversion, **the conformational state B being advantageous**.

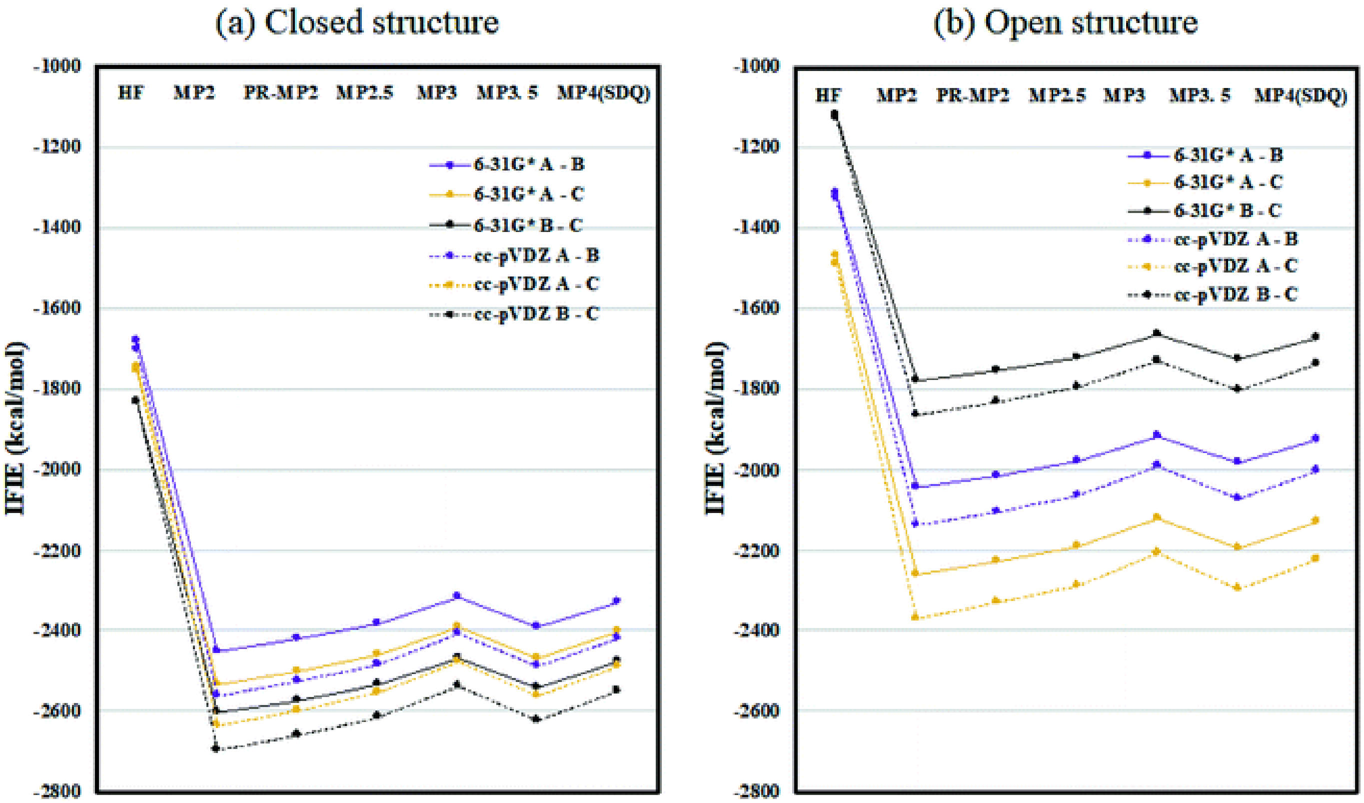

Figure 8: Inter-chain IFIE inter-fragment interaction energies IE sums (a) for the closed structure (6VXX) and (b) for the open structure OS (6VYB). Refer also to the numerical values in Tables S1 and S2.† from DOI: 10.1039/D0RA09555ARSC Adv., 2021, 11, 3272-3279 Interaction analyses of S.A.R.S-CoV-2 spike protein based on fragment molecular orbital calculations. Kazuki Akisawaa et al.

to the reseracher in order to provide An objective method to test hypotesys of relationship and its intensity (Statistical, Clinical).

Results

"Both COVID-19 and WCR exposure can affect the heart and cardiovascular CV system, directly and/or indirectly. S.A.R.S-CoV-2 inhibits intrinsic pathways designed to reduce the R.O.S levels, thereby increasing morbidity. Immune dysregulation, that is, the upregulation of interleukin IL-6 and TNF α and suppression of IFN α and IFN β have been identified in the cytokine storm CS accompanying the severe COVID-19 infections and generates oxidative stress OS. Oxidative stress and mitochondrial dysfunction may further perpetuate the cytokine storm CS, worsening tissue damage, and increasing the risk of severe illness and death.

Similarly low-level WCR generates R.O.S in cells that cause oxidative damage. Oxidative stress OS is considered to be one of the main mechanisms in which WCR exposure causes cellular damage. Among about 100 currently available peer-reviewed study works investigating oxidative effects of low-intensity WCR, 93 of these studies confirmed that W.C.R induces oxidative effects in biological systems. WCR is an oxidative OS agent with a high pathogenic potential especially when exposure is continuous.

Oxidative stress OS is also an accepted mechanism causing endothelial damage. This may manifest in patients with the severe COVID-19 disease in addition to increasing the risk for blood clot formation and worsening hypoxemia. Low levels of glutathione, the master antioxidant, have been observed in a small group of COVID-19 patients, with the lowest level found in the most severe cases. The finding of low glutathione levels GL in these patients further supports oxidative stress as a component of this disease. glutathione, the major source of sulfhydryl-based antioxidant activity in the human body, may be pivotal in COVID-19. The Glutathione deficiency has been proposed as the most likely cause of serious manifestations in the COVID-19 disease. The most common co-morbidities like as hypertension; obesity; diabetes; and chronic obstructive pulmonary disease BCPO support the concept that pre-existing conditions causing low levels of glutathione may work synergistically to create the "perfect storm" for both the respiratory and the vascular complications of severe infection. Another paper work citing 2 cases of COVID-19 pneumonia treated successfully with the intravenous glutathione also supports this hypothesis.

Many study works report oxidative stress OS in the humans exposed to WCR. Peraica et al. found diminished blood levels of the glutathione in workers exposed to WCR from radar equipment (0.01 mW/cm^2 – 10 mW/cm^2; 1.5 – 10.9 GHz). Garaj-Vrhovac et al. Studied the bio-effects following exposure to non-thermal pulsed microwaves from marine radar (3 GHz, 5.5 GHz, and 9.4 GHz) and reported a reduced glutathione levels GL and increased malondialdehyde MD (marker for the oxidative stress) in an occupationally exposed group. Blood plasma BP of individuals residing near mobile phone base stations showed significantly reduced glutathione, catalase, and superoxide dismutase SD levels over unexposed controls. In a study work on human exposure to WCR from mobile phones, increased blood levels of lipid peroxide were reported, while enzymatic activities of superoxide dismutaseSD and glutathione peroxidase GP in the red blood cells decreased, indicating an oxidative stress.

In a study work on rats exposed to 2450 MHz (wireless router frequency), oxidative stress OS was implicated in causing red blood cell RBC lysis (hemolysis). In another work, rats exposed to 945 MHz (base station frequency) at 0.367 mW/cm2 for 7 h/day, over 8 days, demonstrated low glutathione levels GL and increased malondialdehyde MD and superoxide dismutase SD enzyme activity, hallmarks for oxidative stress. In a long-term controlled study work on rats exposed to 900 MHz (mobile phone frequency) at 0.0782 mW/cm2 for 2 h/day for 10 months, there was a significant increase in malon-dialdehyde MD and total oxidant status over controls. In another long-term controlled study work on rats exposed to 2 mobile phone frequencies, 1800 MHz and 2100 MHz, at power densities 0.04 – 0.127 mW/cm2 for 2 h/day over 7 months, significant alterations in oxidant-antioxidant parameters, DNA strand breaks, and oxidative D.N.A damage were found.

There is a correlation between oxidative stress and thrombogenesis. R.O.S can cause endothelial dysfunction ED and the cellular damage C D. The endothelial lining of the vascular system contains ACE2 rec. that are targeted by S.A.R.S-CoV-2. The resulting

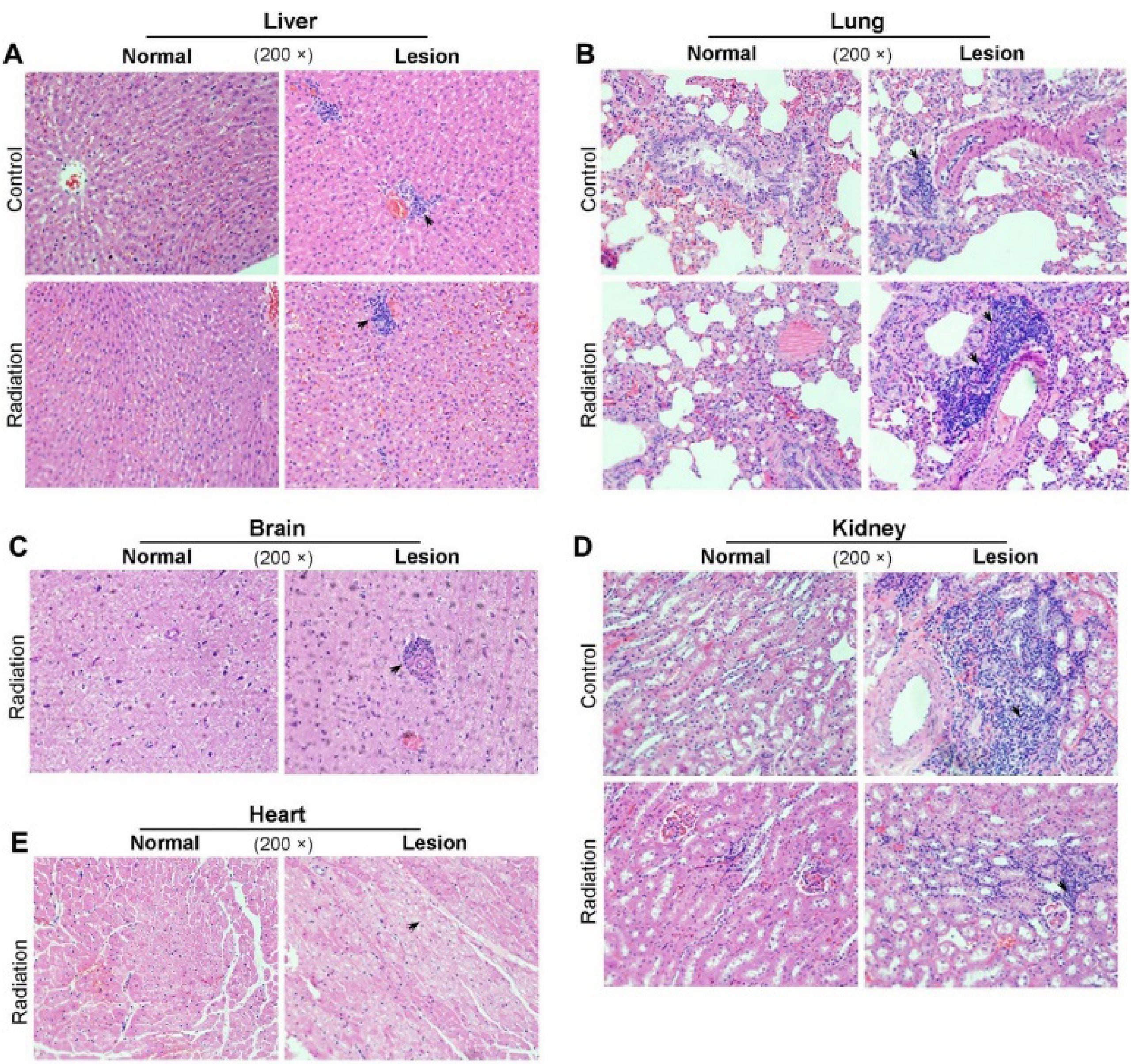

Figure 9: Histopathology analysis of the rabbit tissues after 16 weeks-mobile phone radiation. Rabbit tissues were analyzed by H&E staining. Radiation, rabbits exposed to the mobile phone radiation. Control, rabbits without exposure to mobile phone radiation. Normal/Lesion, normal or lesion tissues observed. Inflammatory cell infiltration (A, B, C, D) and cytoplasmic vacuolation (E) were indicated by black arrows.

endotheliitis can cause luminal narrowing and result in diminished blood flow BF to the downstream structures. Thrombi in arterial structures can further obstruct blood flow BF causing ischemia and/or infarcts in the involved organs, including pulmonary emboli PE and strokes. Abnormal blood coagulation BC leading to micro-emboli ME was a recognized complication early in the history of COVID-19. Out of 184 ICU COVID-19 patients, 31% showed thrombotic complications. Cardiovascular CV clotting events are a common cause of COVID-19 deaths. Pulmonary embolism PE, disseminated intravascular coagulation, liver, cardiac, and the renal failure RF have all been observed in COVID-19 patients" [1].

"Whether electromagnetic radiation ER emitted from mobile phones is hazardous to human health is largely unknown. We investigated the effects of mobile phone radiation on critical organs in a rabbit model by exposing the animals to mobile phone radiation with sub-thermal specific absorption rate (SAR) of 1.0 and 0.7 W/kg for the head and the body, respectively, for about 16 weeks (6 h/day, 6 days/week). There is no apparent change at the organ level. H&E staining showed that radiation-exposure significantly increased inflammatory cell infiltration in the liver and the lungs with a lesser degree of myocardial cell cytoplasmic vacuolation. Results from γ-H2AX staining suggest that radiation can also cause DNA damage in the brain. No apparent activation of Caspase-3 in the organs examined. Our data suggest that mobile phone radiation may be more hazardous to both the liver and the lungs, and less toxic to the brain and heart" [2].

"Concomitant with the ever-expanding use of the electrical appliances and mobile communication systems, public and occupational exposure to electromagnetic fields (EMF) in the extremely-low-frequency and radiofrequency range has become a widely debated environmental risk factor for health. Radiofrequency (RF) EMF and extremely-low-frequency (ELF) MF have been classified as possibly carcinogenic to humans (Group 2B) by International Agency for Research on Cancer (IARC). The production of reactive oxygen species, potentially leading to cellular or systemic oxidative stress, was frequently found to be influenced by EMF exposure in animals and cells. Here In this review, we summarize key experimental findings on oxidative stress related to EMF exposure from animal and cell studies of the last decade. The observations are discussed in the context of molecular mechanisms and functionalities relevant to health such as the neurological function, genome stability, immune response, and reproduction. Most animal and many cell studies showed increased oxidative stress caused by RF-EMF and ELF-MF. In order to estimate the risk for human health by manmade exposure, experimental studies in humans and epidemiological studies need to be considered as well" [3].

"The biological effects on cardiovascular CV development of chicken embryos were examined after radiation exposure RE using mobile phone MP (900 MHz; specific absorption rate˜1.07 W/kg) intermittently 3 h per day during incubation. The Samples were selected by morphological and histological methods. The results showed that the rate of embryonic mortality EM and cardiac deformity increased significantly in exposed group (P <0.05)" [4].

(2G, 3G, and 4G networks use frequencies in the UHF or low microwave bands, 600 MHz to 3.5 GHz).

"In 2011 the International Agency for Research on Cancer IARC classified radiofrequency electromagnetic fields (RF EMF) from cell phones as possibly carcinogenic to humans. The National Toxicology Program NTP and the Ramazzini Institute have both reported that RF EMF exposures significantly increase gliomas and Schwannomas of the heart in rodent studies" [5].

"Cardiac biochemical function CBF indicators used in the studies of microwave-radiation-induced biological injuries mainly included myocardial enzyme ME spectrum levels and the ion concentrations. It is well known that the activities of myocardial enzymes ME and the intrac- extracellular ion concentrations change when the cardio-myocytes CM are injured and the integrity of the cell membrane is broken. The indicators of the myocardial enzyme ME spectrum used in previous studies of microwave-radiation-induced cardiac injuries mainly included the levels of the LDH, creatine kinase, CK-MB and hydroxybutyrate dehydrogenase. The most commonly used indicator of ion concentration was the Ca2+ level of ventricular myocytes.

The heart can secrete various peptide hormones PH to regulate its own function.The expression of these hormones could also be used to evaluate the state of cardiac endocrine CE function. The most popular indicator used in studies of microwave-radiation-induced cardiac injury is atrial natriuretic peptide" [6].

"In the heart of Wistar rats WR, 2.45 GHz RF-EMF exposure for 5 min (50, 100, 150, 200 mW/cm^2) or 30 days (SAR: 0.1 W/kg) resulted in changes in R.O.S and oxidative stress OS markers and increased tissue toxicity and apoptosis or in more lipid peroxidation and reduced S.O.D. 2 studies in Sprague-Dawley rats examined oxidative stress in the heart applying lab-generated 900 MHz RF-EMF signals. After an in utero exposure during the gestational days 13–21 at 0.025 W/kg SAR for 1 h/day and examination at postnatal day 21, there were clear indications of oxidative stress OS, tissue toxicity and apoptosis in the heart organ" [7].

"In heart tissues, MDA and NO levels significantly increased in group III compared with groups I and II ($p < 0.05$). Contrary to these oxidant levels, CAT and SOD enzyme activities decreased significantly in group III compared with the groups I and II (p 0.05)" [8].

A Snapshots of the studied fragment of S under an EF of 107 V m−1 at 0 ns (initial thermalised stable conformation), 200, 300, 600, 700 ns, and after EF-off dynamics during 200 ns. The orientation of the protein is the same in all figures.

Trajectories for different electric-field EF strengths are quantified through the root-mean-square-displacement with respect to the

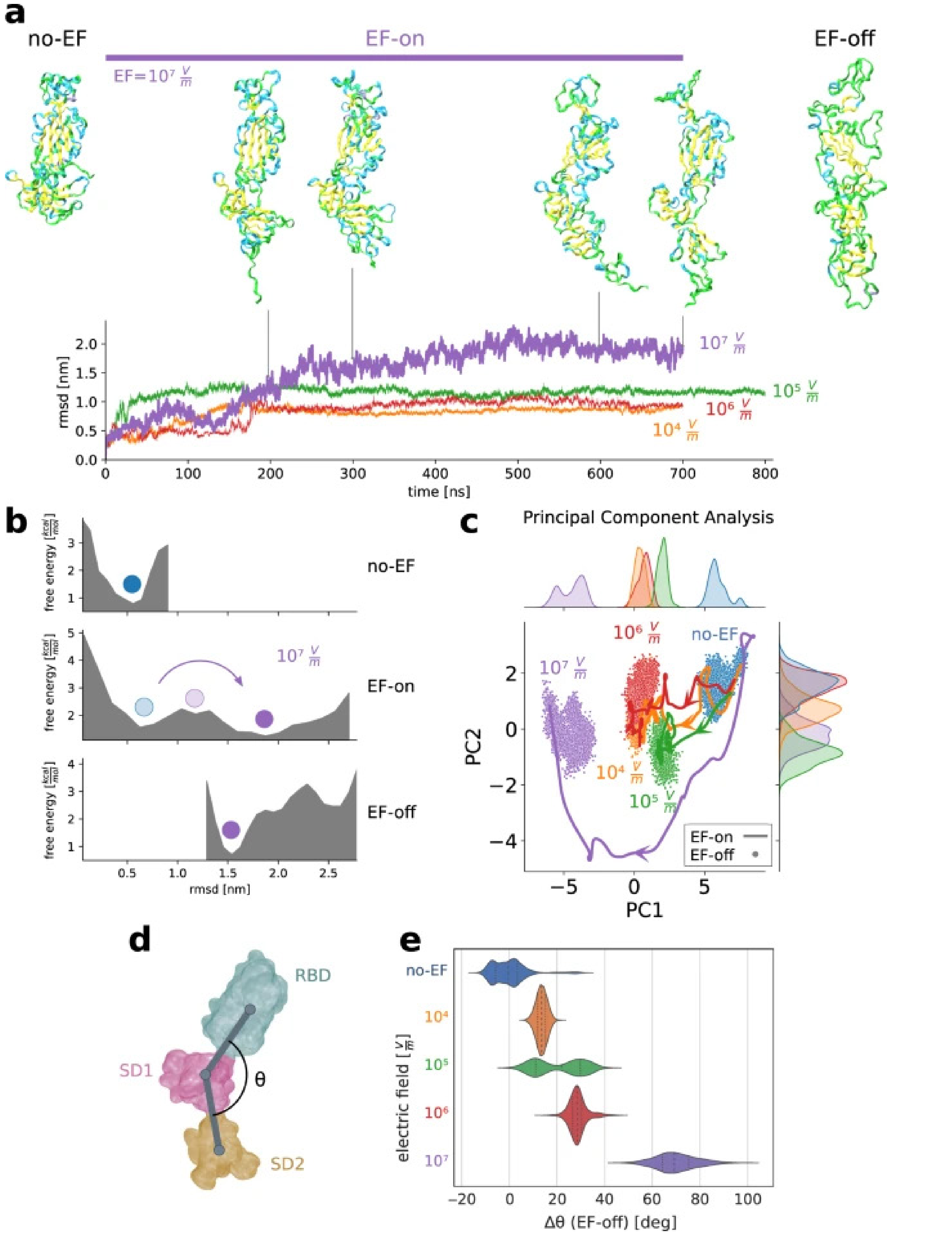

Figure 10: Electric fields EF are able to induce global conformational changes in the spike glycoprotein SP, affecting the stability of folding states FS a, b EF driven major shape changes occur in the different subunits and between subunits of the S protein.

initial structure. Snapshots in a correspond to different times along the EF-on trajectory. b Electric fields EF modify the free energy landscape enabling the protein to overcome the potential barriers PB. Estimated free energy landscape along the thermalisation (no-EF-), EF-on- and EF-off trajectories. The blue and light blue dots identify the energy minimum of the initial structure before and during EF application. Purple dots correspond to the new minimum reached under the EF, which remains stable after switching off the EF. c Principal component analysis PCA reveals the existence and stable nature of new states after EF application . Discretised trajectories of the EF-on and EF-off runs projected onto a plane defined by the 2 principal components (PC1, 20% of variance; PC2, 8.2% of variance). Curves on the upper and right axis show the density of points along PC1 and the PC2. Once the Spike protein has found a new equilibrium basin, which is different for each EF intensity, no return to the initial state occurs after switch-off of the EF. Curves in the EF-on trajectories are low-pass filtered using a Gaussian kernel (standard deviation 10 ns). d Field-induced conformational states CS can be characterised by the angles formed by the vectors connecting the centroids of clustered residues. e Violin plot of the distributions of the shift Δθ of the angle θ for different field intensities (EF-off runs) with respect to a no-EF representative structure. Δθ is suitable to describe the unfolding of the domain SD2 observed in a. In the violin plot, the central line indicates the median, while left and right lines indicate lower and upper quartiles. EF intensities are color-coded equally for all sub-figures.

"The spike protein SP of S.A.R.S-CoV-2 (especially R.B.D.) is unusually vulnerable to external electric fields EF. Results of Figure. reported show that the ensuing states under EF application clearly represent distinct atomic rearrangements depending on field strength. This raises the question whether tailored EF could be designed in order to drive SP towards desired target structural states. Pulse trains, like those used in the food industry, or shaped oscillatory EFs of variable central frequency, envelope, duration and polarisation, could be optimised to promote a selective structural response in a similar way as in concepts involving electromagnetic fields EMF."

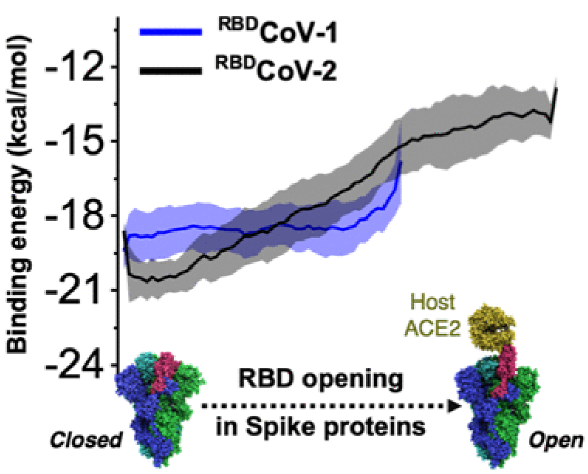

Figure 11: From https://doi.org/10.1021/acs.biochem.2c00301.

Our analysis work in the absence of ACE2 shows that this transition occurs at the energetic cost of breaking very high-frequency contacts between the R.B.D. hinge and the S2 region in chain B and A. The rearrangement of those residues has an energetic cost in the range about of 10–15 kcal/mol which is consistent with the PB analysis that quantifies t**he change in free energy on the order about of 10.4 kcal/mol for 3down to 1up2down.** Our studies work also show the large energetic cost required to transit from closed to 2up1down conformation (~30 kcal/mol) in the absence of the ACE2 rec. which can be associated with mechanical loading and virus-cell collisions at the early stage. This result indicates the propensity of the spike protein SP to likely be found in the 1up2down conformation prior to interacting with cell surface" [9].

Wi-Fi Energy

Wi-Fi systems operate in the wavelength range of 6 ˘ 12 cm. and energy range roughly 0.47 ˘ 0.24 cal/mole. This is 80,500/0.3 ≈ 270,000 times less than the 80.5 kcal/mole energy required to break the chemical bonds.

Cell Phones

Cell phones operate with wavelengths in the region of 100 cm (1 m) corresponding to an energy of 2.86E-05 kcal/mole. This is 8.05E+01/2.56E-;5 ≈ 2,820,000 times less energy than required to break the chemical bonds"

"Given that adiabatic tunnelling breaks the electron-proton binding energy EPBE in the hydrogen atom and that RF-EMF photons can provide this energy in the 2G–5G range, it can be expected that microwave MW adiabatic tunnelling will provide the cumulative RF photons needed to split the antiparallel spin electron APSE pair holding the O–H bond in H2O of 1.88 eV **(117.61 Kcal/mol)**, and generate the hydroxyl (•OH) and hydrogen (•H) free radicals. Photons at the 2G–5G spectral range could provide free radicals FR with biological and medical implications for man's health" [10].

"Our MD study research reveals that continuous microwave irradiation through rotationally hot polar water molecules affects the conformational preferences of a small helical β-peptide. Where conventional heating leads to a kind of complete loss of the structure, the effects" [11].

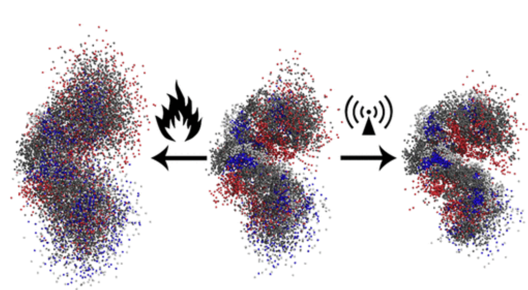

Figure 12: Superpositions of peptide atoms over the entire time span of the trajectory (200 ns). Displayed are structures for simulations at 300 K (middle), conventional heating to 700 K (left), and microwave MW heating to 700 K (right). Tt/Tr are the translational and rotational temperatures during MD simulations.

"Non-ionizing radiation: RF energy is identified as an non-ionizing radiation. The photon energies of RF electro-magnetic waves EW are not adequate to produce the ionization of atoms and molecules In Example radio waves, RW microwaves MW, infrared waves IW, et other. The primary health effect of the non-ionizing radiation is temperature production in body tissue" [12].

"Our results have shown for the first time that the Spike protein SP has the possibility to stay in an active and inactive state based on the external temperature. Heare we found that receptor binding motif (R.B.M), present on the R.B.D. of S1, begins to close around temperature of 40°C and attains a completely closed- conformation at 50°C" [13].

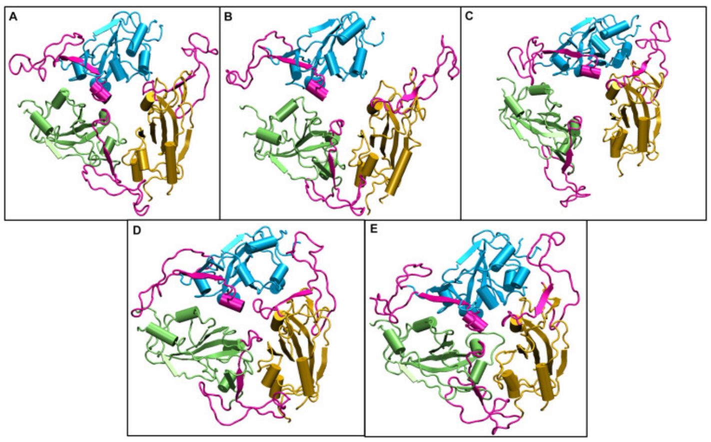

Figure 13: Structures of the receptor binding domain of S protein after 200 ns of simulation at different temperatures exhibit diverse structural dynamics. Time-averaged conformations of R.B.D. of S.A.R.S-CoV-2 Spike protein SP at, (A) 10°C, (B) 20°C, (C) 30°C, (D) 40°C, and (E) 50°C. The 3 chains are colored in lime, cyan, and orange. The receptor binding motif (shown in magenta) is oriented in a confined conformation at higher temperatures.

Experimental Project Hypotesys

In order to test the effect played by wireless radiation is interesting to verify the effect played on animal model -cellular culture heart tissue of the complex:

1) SPIKE PROTEIN + GRAPHENE+ radio or microwave
2) Control group

It is necessary to test various periods of time : 1-2-3-10-24-48-72 hours and after 7 -17 days and using a combination of radiations of different intensity (energy) and wave.

Result

It is necessary verify if there are not only statistical significance but also clinico-toxicological implication.

Discussion

Under an epidemiological point of view It is necessary to consider that young people show no the same level of comorbidity than adults or elderly and that the rare adverse event after some COVID-19 vaccination show an class age distribution: rare pericarditys/ myocarditis in young (Hui-Lee Wonget al., Natalia Abraham et al.) and brain thrombosys under 55 years (24 March 2021 EMA/PRAC/157045/2021 Pharmacovigilance Risk Assessment Committee).

Related proteomics of the link SPIKE protein- ACE2 rec is is of interest to observe that:
"R.B.D. can be either in the open or in the closed position (called up or down conformation respectively). In the up conformation, the R.B.D. jut out away from the rest of S, such that they can easily bind with ACE2"

The open conformational state show more advantageous under an energy point of view

"Electric fields are able to induce global conformational changes in the spike glycoprotein" (https://doi.org/10.1038/s41467-021-25478-7)

"The primary health effect of non-ionizing radiation is temperature production in body tissue" [12]. "Our results have shown for the first time that the Spike protein has the possibility to stay in an active and inactive state based on the external temperature" [13].

Related the pathology presentation:
"Both COVID-19 and WCR exposure can affect the heart and cardiovascular system, directly and/or indirectly" [1].

"Out of 184 ICU intensive care unit COVID-19 patients, 31% showed thrombotic complications . Cardiovascular clotting events are a common cause of COVID-19 deaths . Pulmonary embolism PE disseminated intravascular coagulation, liver, cardiac, and renal failure have all been observed in COVID-19 patients" [1].

"There is a correlation between oxidative stress and thrombogenesis" [1].

And of interest in animal model: "The biological effects on cardiovascular CV development of chicken embryos CE were examined after radiation exposure using mobile phone MP (900 MHz; specific absorption rate˜1.07 W/kg) intermittently 3 h per day during incubation. Samples were selected by morphological and histological methods. The results showed the rate of embryonic mortality EM and cardiac deformity CD increased significantly in exposed group ($P < 0.05$)" [4].

Related the graphene chemico -phisical property
"Graphene, a single 2-dimensional (2D) layer of a hexagonal structure consisting of sp2 hybridized carbon atoms, its derivatives have received an increasing attention in bio-medical fields, due to its unique physico chemical properties: high surface area SA, excellent electrical conductivity, strong mechanical strength, un-paralleled thermal conductivity, and ease of surface functionalization."

Conclusion

Related this evidence reported and the specific distribution by age of rare pericarditys or CNS thrombosys After some COVID-19 vaccination Is crucial to more deeply investigate if there are relationship with graphene impurities (if present) and the wireless radiation or not.

The same to verify if this effect can produce pathological event in significative clinical way. Even if the protrombotic and proinflamatory effect of the S.A.R.S cov-2 spike protein are cleary reported by Many scientific database and the effect played by various wireless radiation are studied using various models it is relevant to verify also if a cumulative effect can act on a ptahological common event.

The same it is crucial verify if Garphene presence with its electrical conductivity can increase the effect played by electromagnetic field on SPIKE protein-ace2 rec. (Various independent researcher reported evidence or in vials of vaccine or in blood of vaccinated).

Even if in the various countries COVID-19 vaccine Spike protein based have been approved by regulatory agency The report of some rare adverse event in subpopulation or limitation of other vaccine according the age class require a more deeply investigation to find if present relationship of interest.

Every year various approved drugs are recalled by authorities due by safety motivations.

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