Attempt to Treat Coronavirus Disease (COVID-19) with Electromagnetic Wave Irradiation

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Abstract

The effectiveness of a combination of frequency, intensity, etc., in the natural vibration of microwaves targeting the collapse of the most delicate part, the Heptad Repeat 2 (HR 2) region, in spike proteins of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is investigated. Based on the results, inactivation of the virus is attempted through the use of irradiating microwaves directed toward the infected site from outside the body.

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1. What is the HR2 region?

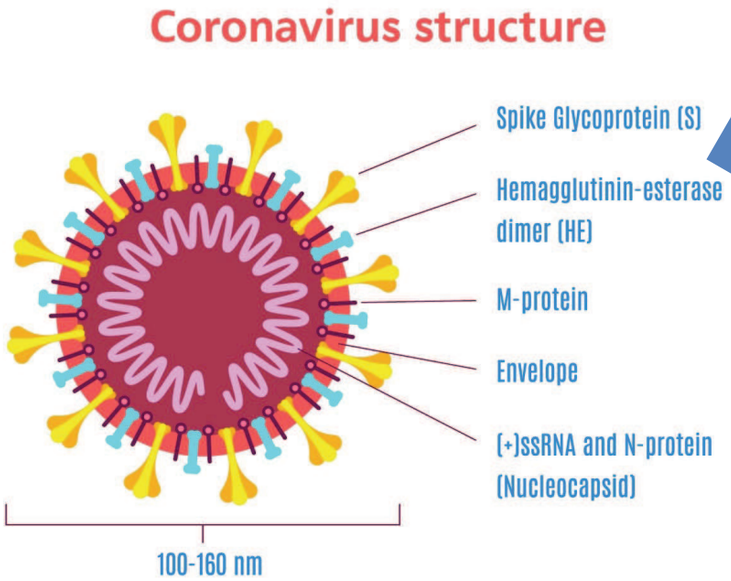


Fig. 1 Structure of coronavirus

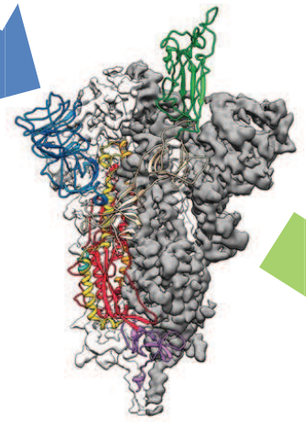


Fig. 2 Spike

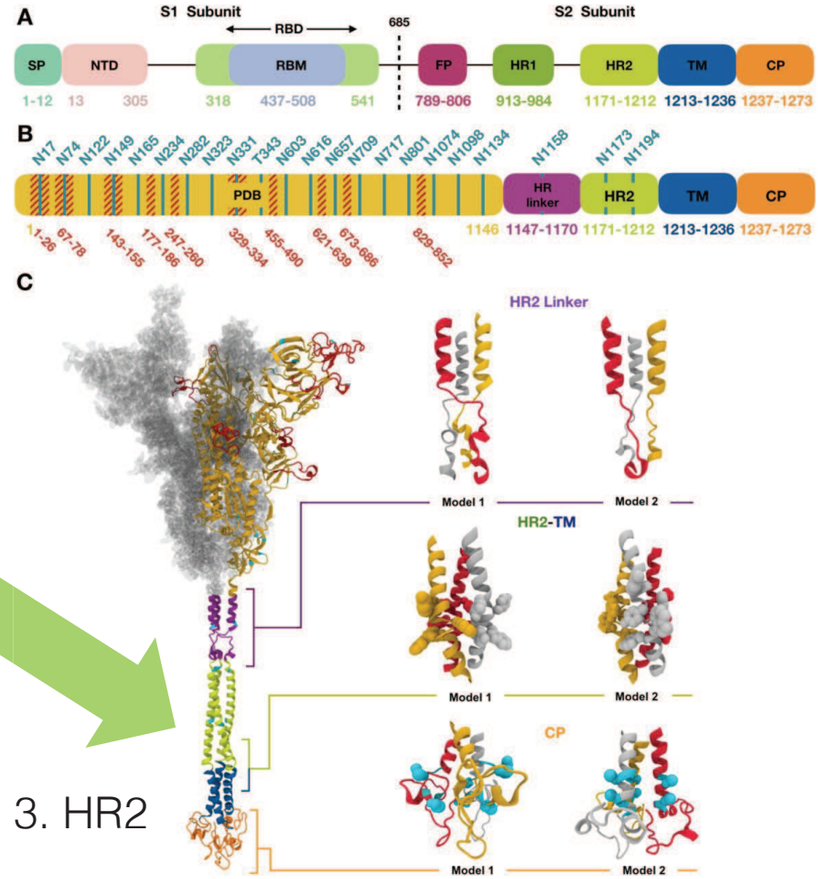


Fig 3. HR2

HR2 is a thin part at the root of the surface spike protein on SARS-CoV-2. It collapses when the temperature is raised from 25°C to 50°C ①. A similar collapse is attempted by using non-thermal effects, ② such as microwave irradiation. Assuming that the HR2 region is the most vulnerable part in the SARS-CoV-2 S protein, its alteration and division are targeted.

～Defeat spike proteins that are important for infection, like"Ashiharai" (sweeping one's opponent's legs) in Judo!

2. Understanding the physical phenomena of temperature change in HR 2 and reproduction of results via non-thermal effects of electromagnetic waves

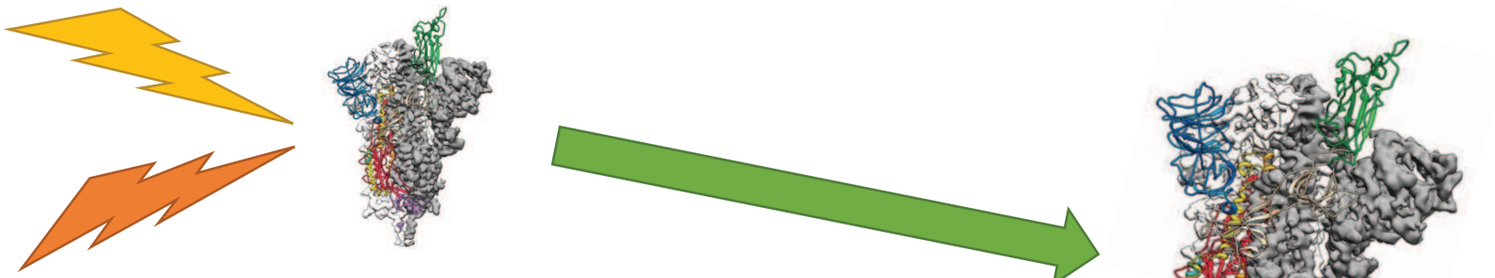
- Molecular motion of HR2 in water at 25°C, and above 50°C, is understood, and its collapse is simulated. At a water temperature of 38°C, the natural frequency that is the most effective for collapsing HR2 via non-thermal effects, such as microwave irradiation, is derived. (In the calculation, the natural vibration of the total S2 subunit, including HR1, is considered.)
- To obtain the most suitable combination of parameters such as frequency, (minimum) strength, synthesis, modulation, irradiation time, direction, number of irradiations, and interval, simulation, and irradiation experiments are conducted.
- Referencing the natural vibration ③ of the S1 subunit (wavenumber is about 360cm^{-1}), the natural vibration of the total spike protein is obtained. An electromagnetic wave is generated by the synthesis or modulation, and the generated wave induces the resonance of the spike protein itself. Through these processes, the effect of the collapse can be enhanced.
- Effective targets potentially exist at other sites, such as the joint part of S1 and S2 subunits, apart from HR2.
- The effects on human tissues are also investigated. If the electromagnetic irradiation is effective for treatment, the irradiation instruments will be mass-produced.

3. Examples of natural vibration synthesis to collapse the spike protein

- HR2 collapse by dual wave synthesis

Natural vibration of the total spike protein

Natural vibration of HR2

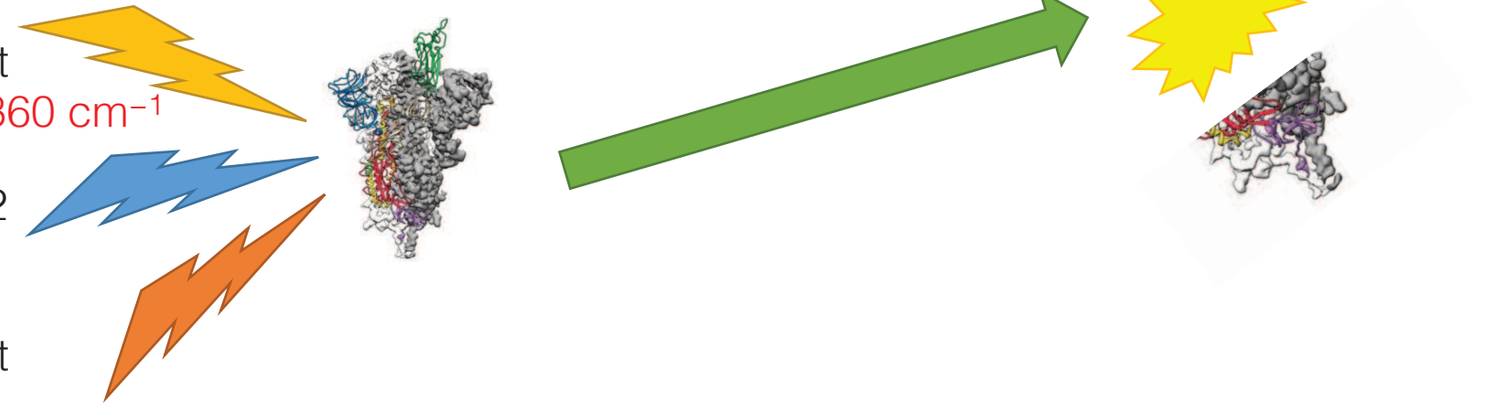


- S1 and S2 subunit division by ternary wave synthesis

Natural vibration of S1 subunit
- approximate wavenumber 360 cm^{-1}

Natural vibration of S1 and S2 subunits' joint

Natural vibration of S1 subunit



4. Discussion

- There is a high possibility that the energy of irradiation achieved at 50°C is not harmful to human tissues.
- Microwave irradiation at the appropriate frequency can be applied to treatments involving inactivation of other viruses or bacteria and the exhaust of heavy metals from human body.

Acknowledgement

The author would like to thank Crimson Interactive Pvt. Ltd. (Ulatus) – www.ulatus.jp for their assistance in manuscript translation and editing. In addition, the author would like to thank Enago (www.enago.jp) for the English language review.

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Fig. 2・ Marc G Airhart. (2020). Breakthrough in Coronavirus Research Results in New Map to Support Vaccine Design. The University of Texas.

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