2023 年 9 月 6 日

日本機械学会北海道支部　バイオメカニクス懇話会

第 45 回講演会

（共催：日本機械学会北海道支部）

主査　大橋　俊朗

下記の要領にて第 45 回講演会を日本機械学会北海道支部特別講演会との共催として開催いたします。なお本講演会は、北海道大学 L-station 令和 5 年度「若手研究者の研究支援制度（国際研究集会等開催支援制度）、申請者：豊原 涼太特別助教」の助成を受けております。皆様のご参加をお待ちしております。

記

日　時：2023 年 9 月 29 日（金），16:00～17:00

場　所：北海道大学工学部 A1-17

講　演：

「Ultrasonic emission effects induced by electromagnetic radiation magnetic nanovectors」

Prof. M. Ricardo Ibarra
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Abstract:

Energy absorption by Magnetic Nanoparticles (MNPs) under alternating magnetic fields is the source of the heating properties used for magnetic fluid hyperthermia (MFH). Over the last few years it has been shown that, when energy absorption by MNPs occurs in MNPs uploaded cells, biological membranes can suffer physical damage as a consequence of the energy released by the MNP. [1,2] This membrane damage cannot be explained by considering only the effects of temperature. We observed, as theoretically predicted [3], a large increment in the amplitude of the 2nd harmonic signal for the samples containing MNPs that were not present in the nonmagnetic nanoparticles samples control. This constitutes a relevant fingerprint of the ultrasound generation due to magneto-acoustic interaction in the MNPs. Our studies were extended to several types of magnetic nanovectors with liposome formulation. The aggregation of the magnetic nanoparticles due to magnetic dipolar interaction was studied. An efficient targeting of the magnetic nanvovector lead to the possibility of performing ultrasound theragnostic by combined acoustic imaging and MFH treatment.

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