

CC01-S3

Physics and Applications of HIFU Therapy for Beginners

15:00-15:30

Room 203

Chairperson(s): **Yongrae Roh** (*Kyungbook National Univeristy, Korea*)
Young-Sun Kim (*MINT Intervention Hospital, Korea*)

Ultrasound Cavitation and Drug Delivery

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Ultrasound cavitation has been an emerging technique for enhancing drug delivery. Cavitation occurs when ultrasound waves are propagated through a liquid medium and cause the formation, growth, and collapse of microbubbles. These microbubbles can create transient pores in cell membranes and enhance the uptake of drugs by cells. Additionally, the physical forces generated by cavitation can also increase the diffusion and distribution of drugs within tissues. Recent studies have shown that ultrasound cavitation can be used to enhance the delivery of a wide range of therapeutic agents, including chemotherapy drugs, antibodies, and gene therapies. The cavitation can occur either by externally injected microbubbles or internally generated bubbles, depending on the energy of ultrasound. One of the most promising applications

of ultrasound cavitation is in the treatment of cancer. By enhancing the delivery of chemotherapy drugs, ultrasound can improve the efficacy of cancer treatment while minimizing the side effects associated with traditional chemotherapy. Furthermore, ultrasound cavitation can also be used to enhance the effect of immunotherapies, which can help to stimulate the patient's own immune system to fight cancer. In this talk, we will review the current state of research on ultrasound cavitation and drug delivery, with a focus on its application in cancer treatment. We will discuss the mechanisms of ultrasound cavitation, the types of drugs that can be delivered using this technique, and the potential clinical applications of ultrasound cavitation in the future.