

第49回生命科学先端研究センター 学術セミナー

日時：平成21年10月21日（水）午後6時から7時

場所：医薬研究棟4階 放射線基礎医学ゼミナール室

講師：Paul A. Campbell 教授

(Carnegie Physics Laboratory, University of Dundee, UK)

演題：「Microbubble Cavitation for Therapy: Present Status and Future Directions」

英国Dundee大学のPaul A. Campbell教授はJSPA支援により来日され、福岡大学、富山大学両医学部に短期に滞在されます。マイクロバブルの動態研究では著名な研究者で、Nature Physicsをはじめ多くの論文を書かれています。この機会に治療応用を目指して、上記の演題で講演していただきます。多くの方に参加いただければ幸いです。本セミナーは大学院医学薬学教育部の単位認定の対象になります。

Abstract

Microbubble contrast agents were originally developed to enhance echogenicity in diagnostic sonography. However, their somewhat unique acoustic response and facility to transduce energy into spatially focussed regimes, together with the clinical demand for non-invasive adjuncts and options to conventional therapy, have seen interest in exploring the therapeutic potential of microbubbles grow steadily within this past decade or more. For the purposes of the present paper, the author has sought to select several key aspects of acoustically driven microbubble interactions, (both with other bubbles, and with cells also) and to assess what we have learned, and perhaps more importantly, what we still require to understand better. This is presented in the context of both in vitro sonoporation experimentation, and also with more clinically related areas such as transdermal drug delivery

En route, we will highlight some personal preferences with in-vitro experiments, namely the advantages to be gleaned by controlling the spatial placement of microbubbles within bespoke optical traps. The objective here is to improve our understanding of their statistical behaviour of interactions, and to validate computational models for eventual optimisation. Observations first centre on individual microbubbles of commercial [low-index] ultrasound contrast agents and their interactions with proximal surfaces. We then progress to the situation of multiple microbubbles in controlled geometries. Some nuances of high speed imaging cameras are highlighted. We also compare our own observations with a selection of corroborative highlights from the literature, and finally, make some suggestions as to where future research efforts might be most fruitfully directed.

◎問い合わせ先

近藤 隆 (大学院医学薬学研究部教授)

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