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Acoustic trapping and collapsing of microbubbles in stents. FEIYAN CAI, FEI LI, Shenzhen Institutes of Advanced Technology,Chinese Academy of Sciences, PENGFEI ZHANG, Qilu Hospital of Shandong University, HAIRONG ZHENG, Shenzhen Institutes of Advanced Technology,Chinese Academy of Sciences — Stents are commonly used in a coronary artery or any artery after angioplasty, but has the drawback to cause arterial restenosis. Targeted drug delivery has proved their efficacy at preventing coronary restenosis near stents. Here we propose a microbubble-based approach to enhance drug delivery by ultrasonically exciting the elastic resonances of the stents to generate a sound field that can trap and collapse microbubbles carrying drugs, which are consequently released near the stents. We report numerical and experimental results displaying the procedure of acoustic trapping and collapsing of microbubbles near the resonant polylactide (PLA) stents. Ultrasound of 1.5MHz is used to drive the stent resonances and generate a localized sound field that attracts microbubbles from the vessel center to the stent walls. These trapped microbubbles collapse near the surface of the stents when the input power of ultrasound is suddenly increased.

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