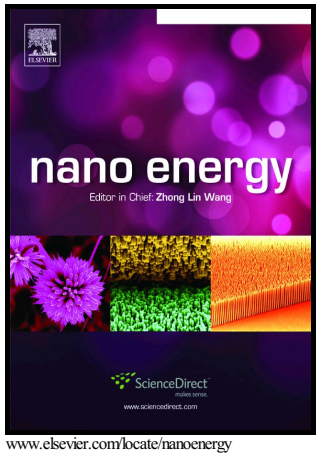

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ABSTRACT

Herein, we report a self-powered flexible piezoelectric acoustic sensor (f-PAS) inspired by basilar membrane in human cochlear. The f-PAS covered the voice frequency spectrum via the combination of its low quality (Q) factor and multi-resonant frequency tuning, exhibiting four to eight times higher sensitivity than the conventional condenser sensor. Our piezoelectric acoustic sensor with a thin membrane design produced sufficient output voltages by the distinct resonant movement of the $Pb[Zr_{0.52}Ti_{0.48}]O_3$ (PZT) membrane under the minute acoustic sound stimuli. Multiple sensor channels were integrated in a single

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