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[Nat. Biotechnol., 07 October 2024 | https://doi.org/10.1038/s41587-024-02426-6](https://doi.org/10.1038/s41587-024-02426-6)**Amplifying mutational profiling of extracellular vesicle mRNA with SCOPE****Authors and Affiliations** ^

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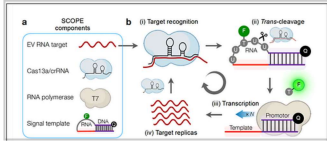
Abstract

Sequencing of messenger RNA (mRNA) found in extracellular vesicles (EVs) in liquid biopsies can provide clinical information such as somatic mutations, resistance profiles and tumor recurrence. Despite this, EV mRNA remains underused due to its low abundance in liquid biopsies, and large sample volumes or specialized techniques for analysis are required. Here we introduce Self-amplified and CRISPR-aided Operation to Profile EVs (SCOPE), a platform for EV mRNA detection. SCOPE leverages CRISPR-mediated recognition of target RNA using Cas13 to initiate replication and signal amplification, achieving a sub-attomolar detection limit while maintaining single-nucleotide resolution. As a proof of concept, we designed probes for key mutations in *KRAS*, *BRAF*, *EGFR* and *IDH1* genes, optimized protocols for single-pot assays and implemented an automated device for multi-sample detection. We validated SCOPE's ability to detect early-stage lung cancer in animal models, monitored tumor mutational burden in patients with colorectal cancer and stratified patients with glioblastoma. SCOPE can expedite readouts, augmenting the clinical use of EVs in precision oncology.

논문정보

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관련 보도자료



유전자가위 기반 고감도 암 진단 플랫폼 개발

한-미 공동연구진이 mRNA(messenger RNA, 메신저 RNA)를 이용해 암을 조기에 진단할 수 있는 기술을 개발하였다. 한국생명공학연구원(원장 김장성, 이하 생명연) 바이오나노연구센터 강태준 박사 연구팀은 매사추세츠 종합병원(Massachusetts General Hospital,...

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관련 링크

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