Literature Review

RNA Circularization Diminishes Immunogenicity and Can Extend Translation Duration In Vivo

HPLC Column, Sepax, SRT SEC-2000 PEEK, 5um, 2000 A
4.6 x 300 mm

Part Number: 215980P-4630

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Massachusetts Institute of Technology

Wesselhoeft, R. Alexander, et al. "RNA circularization diminishes immunogenicity and can extend translation duration in vivo." Molecular cell 74.3 (2019): 508-520.
https://doi.org/10.1016/j.molcel.2019.02.015

Authors

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Abstract

Circular RNAs (circRNAs) are a class of single-stranded RNAs with a contiguous structure that have enhanced stability and a lack of end motifs necessary for interaction with various cellular proteins. Here, we show that unmodified exogenous circRNA is able to bypass cellular RNA sensors and thereby avoid provoking an immune response in RIG-I and Toll-like receptor (TLR) competent cells and in mice. The immunogenicity and protein expression stability of circRNA preparations are found to be dependent on purity, with small amounts of contaminating linear RNA leading to robust cellular immune responses. Unmodified circRNA is less immunogenic than unmodified linear mRNA in vitro, in part due to the evasion of TLR sensing. Finally, we provide the first demonstration to our knowledge of exogenous circRNA delivery and translation in vivo, and we show that circRNA translation is extended in adipose tissue in comparison to unmodified and uridine-modified linear mRNAs.

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https://www.sciencedirect.com/science/article/pii/S1097276519301054

circRNA was purified from impurities using Sepax SRT-2000 SEC

Sample

Broad Sample Type	DNA/RNA/OLIGO
Sample	circRNA
Sample Notes	circRNA - Engineered, hEpo splicing reaction
Molecular Weight of Sample	1-6kb

Experimental conditions

Column	SRT SEC-2000 PEEK, 5um, 2000 A 4.6 x 300 mm
Mobile Phase	RNA was run in RNase-free TE buffer (10mM Tris, 1mM EDTA, pH:6)
Flow Rate	0.3mL/minute
Instrument	HPLC
Instrument Notes	Agilent 1100 Series, RNA was detected by UV absorbance at 260nm, but was collected without UV detection

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Literature Reference
circRNA on Sepax Analytical SEC

LR202202962

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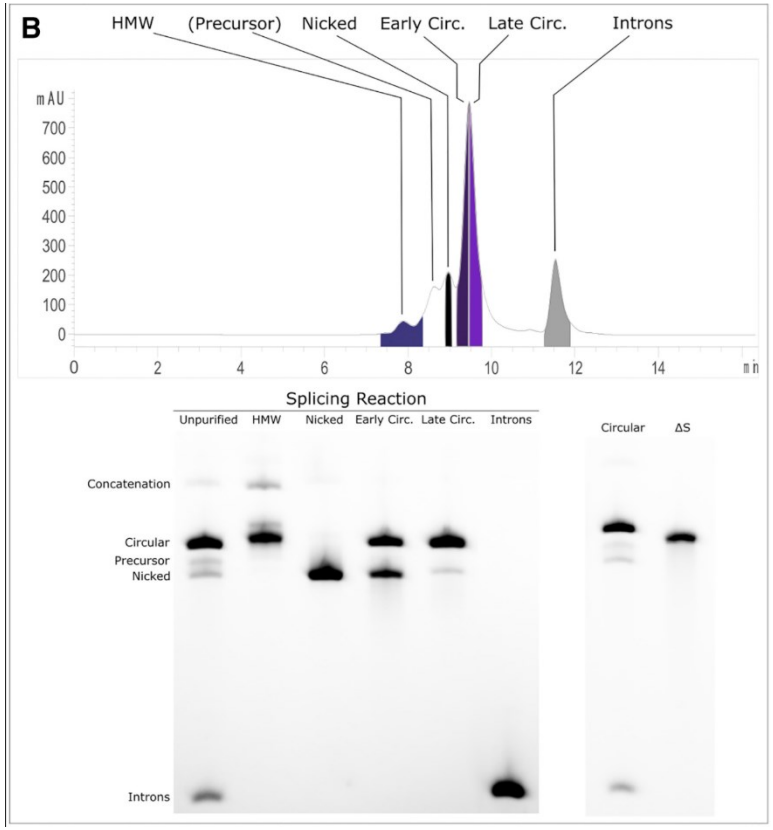

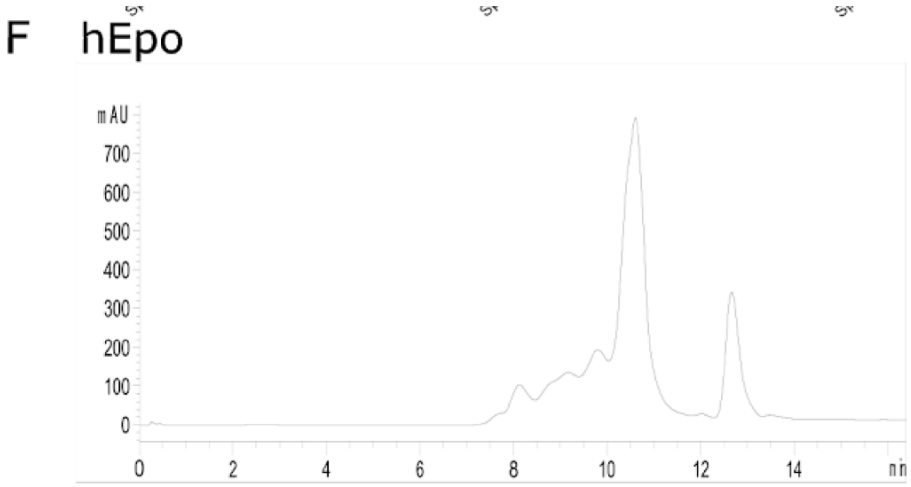

B: Top: HPLC chromatogram of an unpurified splicing reaction. Bottom: agarose gel of purified fractions. Adequate separation of precursor RNA was difficult, therefore, ΔS was used instead.

F) HPLC chromatogram of an unpurified hEpo splicing reaction

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Order Information

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