

IncRNA *SLERT* controls phase separation of FC/DFCs to facilitate Pol I transcription

Man Wu, Guang Xu, Chong Han, Peng-Fei Luan, Yu-Hang Xing, Fang Nan, Liang-Zhong Yang, Youkui Huang, Zheng-Hu Yang, Lin Shan, Li Yang, Jiaquan Liu and Ling-Ling Chen

Science **373** (6554), 547-555.
DOI: 10.1126/science.abf6582

Keeping the nucleolus a liquid condensate

The nucleolus is a multilayered, membraneless nuclear condensate in which DNA polymerase I (Pol I)-mediated ribosomal DNA (rDNA) transcription and pre-rRNA processing occur in fibrillar center and dense fibrillar component (FC/DFC) units. How the biophysical properties of the nucleolus are regulated has remained elusive. Wu *et al.* found that the RNA helicase DDX21 forms a shell coating each FC/DFC unit in the nucleolus (see the Perspective by Yamazaki and Hirose). The authors found that a long noncoding RNA called *SLERT* facilitates the transition from the open to the closed configuration of the helicase using a chaperonelike mechanism. DDX21 in the closed conformation forms loose clusters that confer the FC/DFC unit sufficient liquidity and space required for Pol I processivity. In addition, DDX21 within the loose clusters cannot approach and wrap rDNA, thus licensing rDNA for transcription.

Science, abf6582, this issue p. 547; see also abj8350, p. 486

ARTICLE TOOLS

<http://science.sciencemag.org/content/373/6554/547>

SUPPLEMENTARY MATERIALS

<http://science.sciencemag.org/content/suppl/2021/07/28/373.6554.547.DC1>

RELATED CONTENT

<http://science.sciencemag.org/content/sci/373/6554/486.full>

REFERENCES

This article cites 40 articles, 8 of which you can access for free
<http://science.sciencemag.org/content/373/6554/547#BIBL>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2021 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works