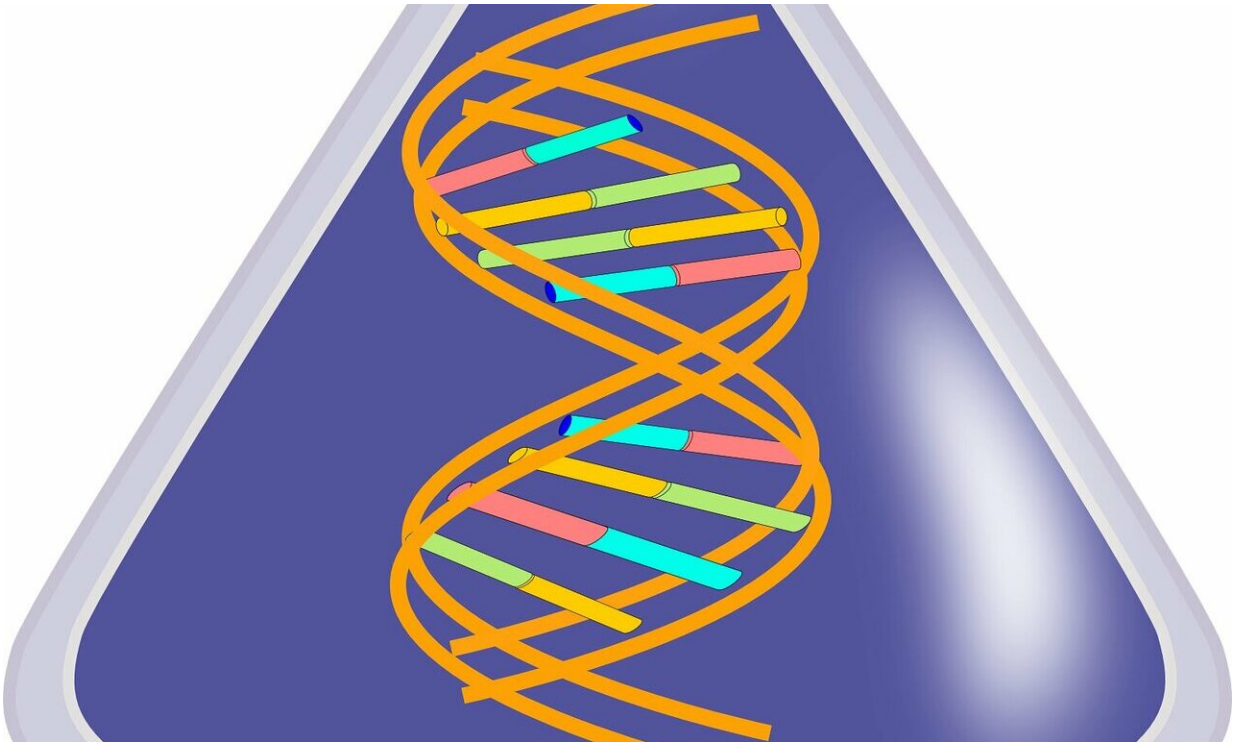
Pinpointing where single-stranded transcripts convert into double-stranded RNAs

July 28 2021



Credit: CC0 Public Domain

St. Jude scientist Vibhor Mishra, Ph.D., is homing in on the location where important processes in gene regulation occur, and where single-stranded transcripts are converted into double-stranded RNAs (dsRNAs).

"We present evidence that Pol IV-RDR2 association involves contact between RDR2 and NRPD1, Pol IV's largest catalytic subunit," explains Mishra. "As the only subunit never shared by Pol II or Pol IV, NRPD1 interaction accounts for RDR2's specific association with Pol IV. The positions of the protein docking sites suggest that Pol IV transcripts are generated in close proximity to RDR2's catalytic site, enabling RDR2 to efficiently engage Pol IV transcripts and convert them into dsRNAs."

The study was published in *PNAS*.

Mishra is a researcher in the Protein Production Facility at St. Jude, which provides a large-scale protein expression and purification service to support the translation of discoveries in molecular and cellular biology to chemical and structural biology. The facility offers state-of-the-art technologies for protein expression/purification from either bacterial or insect cell systems. The facility is equipped with a 120 L fermentor for bacterial growth, several 10 L fermentors for bacterial and insect cell growth, AKTA Explorer purification systems and a robotic workstation for initial crystallization trials. The facility has worked with about 30 St. Jude investigators, expressing and purifying over 400 different proteins for use in structural and biochemical characterization, high-throughput screens, and use as reagents or antigens.

More information: Vibhor Mishra et al, Assembly of a dsRNA synthesizing complex: RNA-DEPENDENT RNA POLYMERASE 2 contacts the largest subunit of NUCLEAR RNA POLYMERASE IV, *Proceedings of the National Academy of Sciences* (2021). DOI: 10.1073/pnas.2019276118

Provided by St. Jude Children's Research Hospital