

SMS Spring 2023 Eyring Lecture

Friday Mar 17 | 3pm | Biodesign Auditorium

Why did Biology Begin with RNA and not some other Genetic Material?

The prebiotic synthesis of the canonical ribonucleotides is likely to have been accompanied by the synthesis of related nucleotides such as arabino-, threo-, and deoxy-nucleotides. How might modern RNA might have emerged from this primordial heterogeneity? We have found that nonenzymatic template-directed primer extension with activated ribonucleotides is generally more efficient than with other classes nucleotides. On the other hand, noncanonical nucleotides in template strands can be copied over to yield an RNA product. Our observations suggest that nonenzymatic copying served as a chemical selection mechanism that allowed relatively homogeneous RNA to emerge from a complex mixture of prebiotically synthesized nucleotides and oligonucleotides.

Jack Szostak, PhD

Professor, University of Chicago

Dr. Szostak is a University Professor and Professor of Chemistry at the University of Chicago, and an Investigator of the Howard Hughes Medical Institute. Dr. Szostak's early research on telomere structure and function and the role of telomere maintenance in preventing cellular senescence was recognized by the 2006 Albert Lasker Basic Medical Research Award and the 2009 Nobel Prize in Physiology or Medicine. In the 1990s Dr. Szostak and his colleagues developed in vitro selection as a tool for the isolation of functional RNA, DNA and protein molecules from large pools of random sequences. Dr. Szostak's current research interests are in the laboratory synthesis of self-replicating systems and the origins of life.

