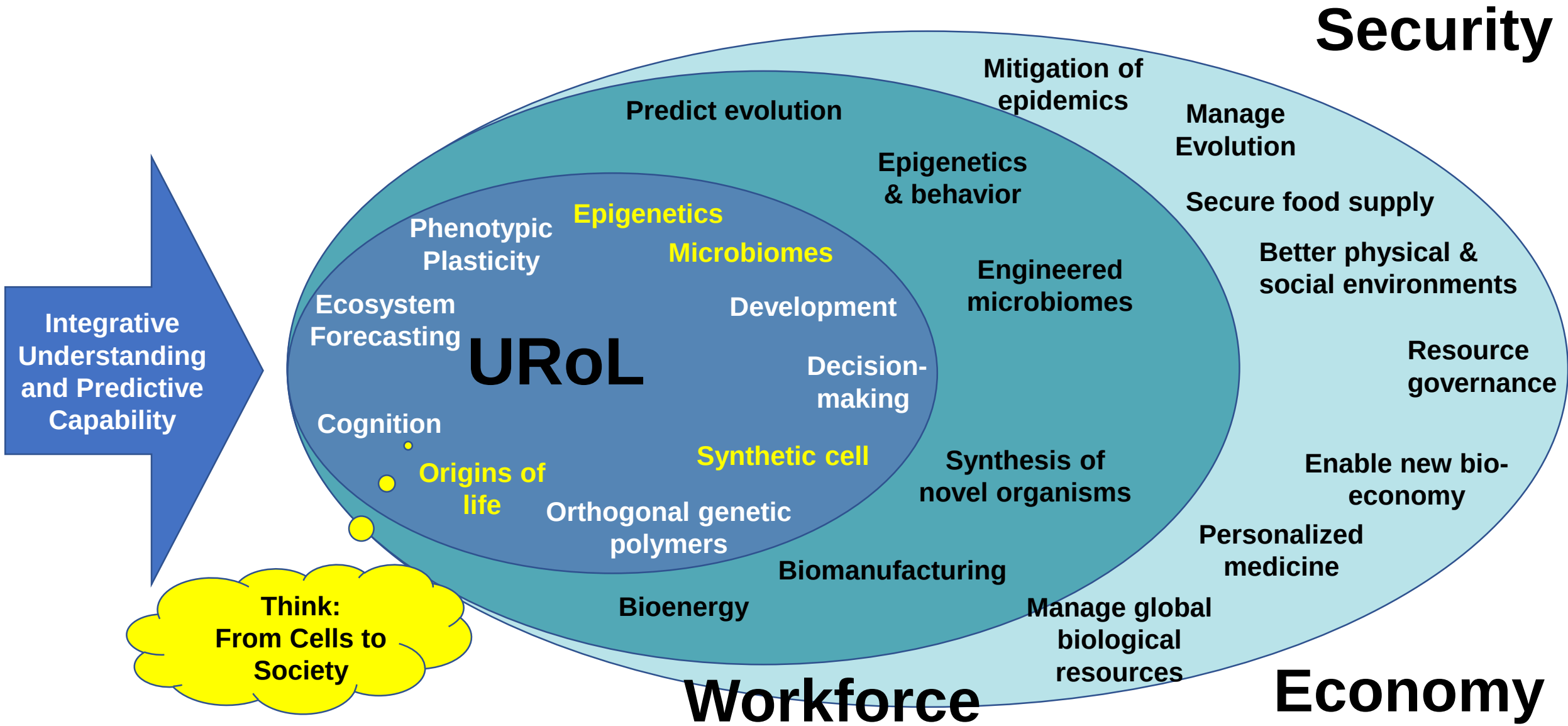
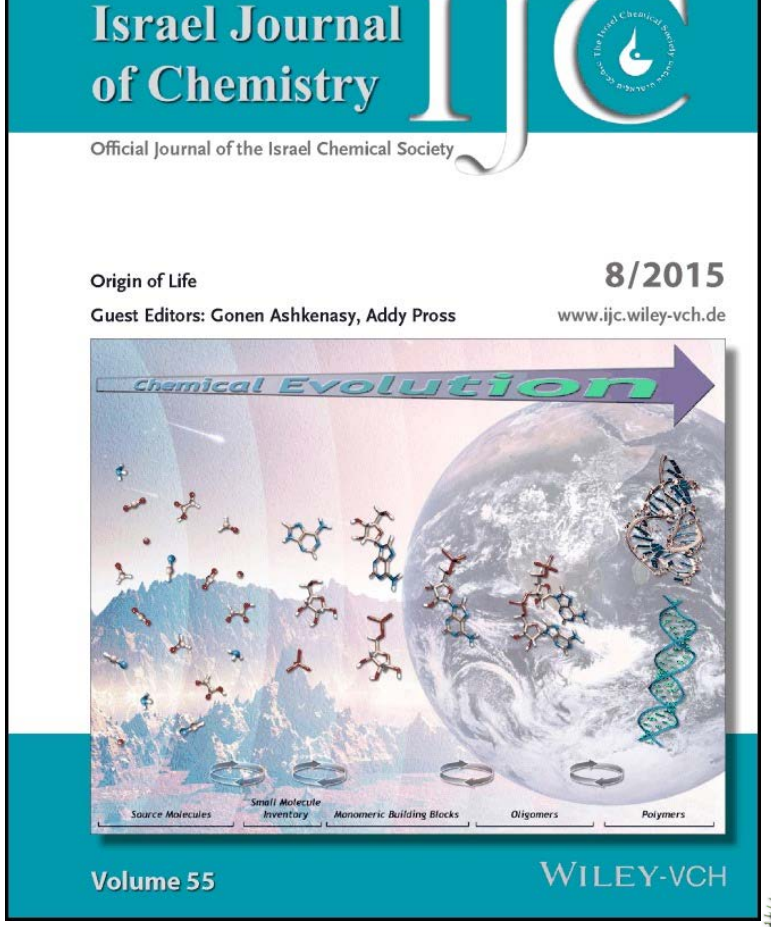
Outcomes for Science and Society

"More Stakeholders, Broader Opportunities, Broader Impact"



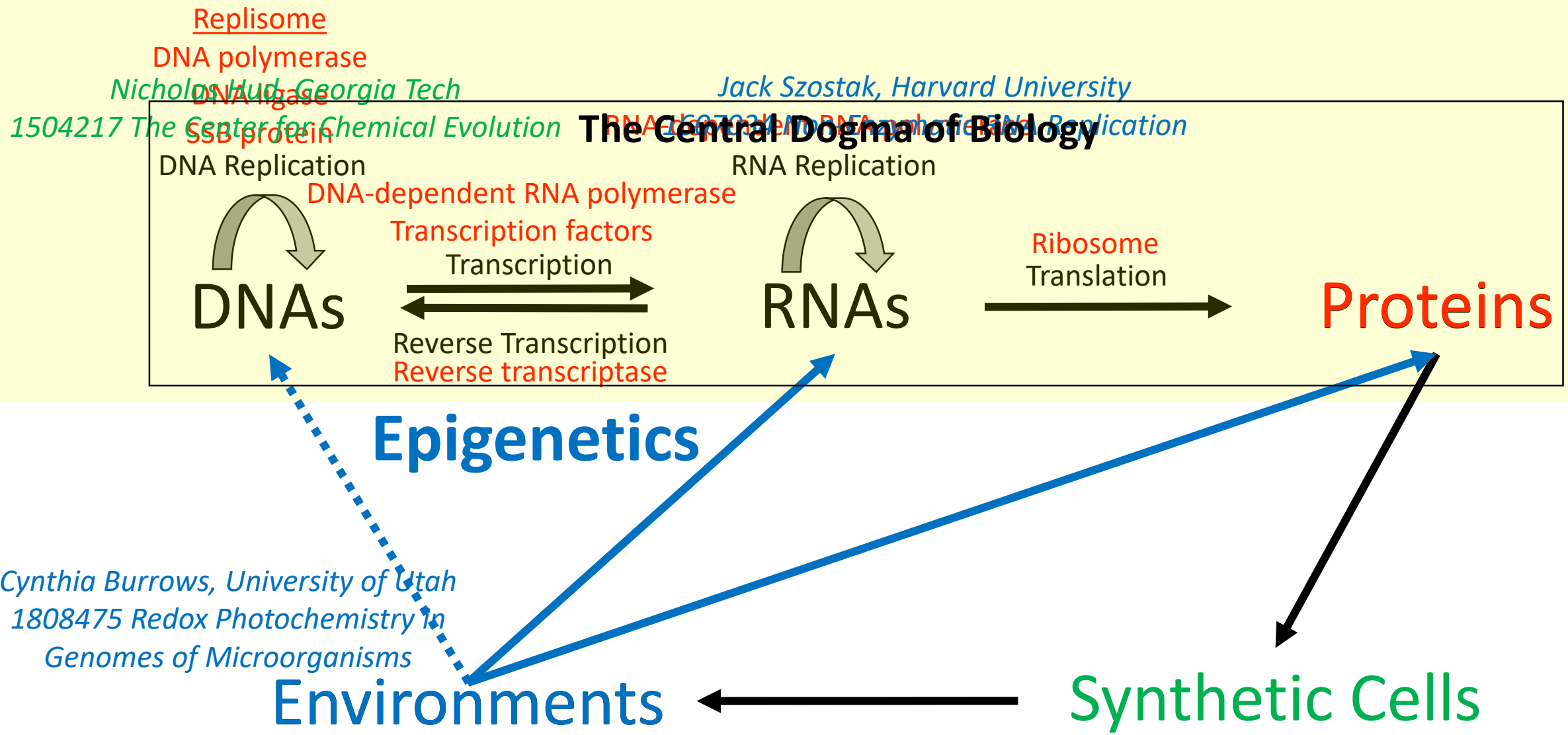
Can Zeroing In Shine Light on the Rules of Life?



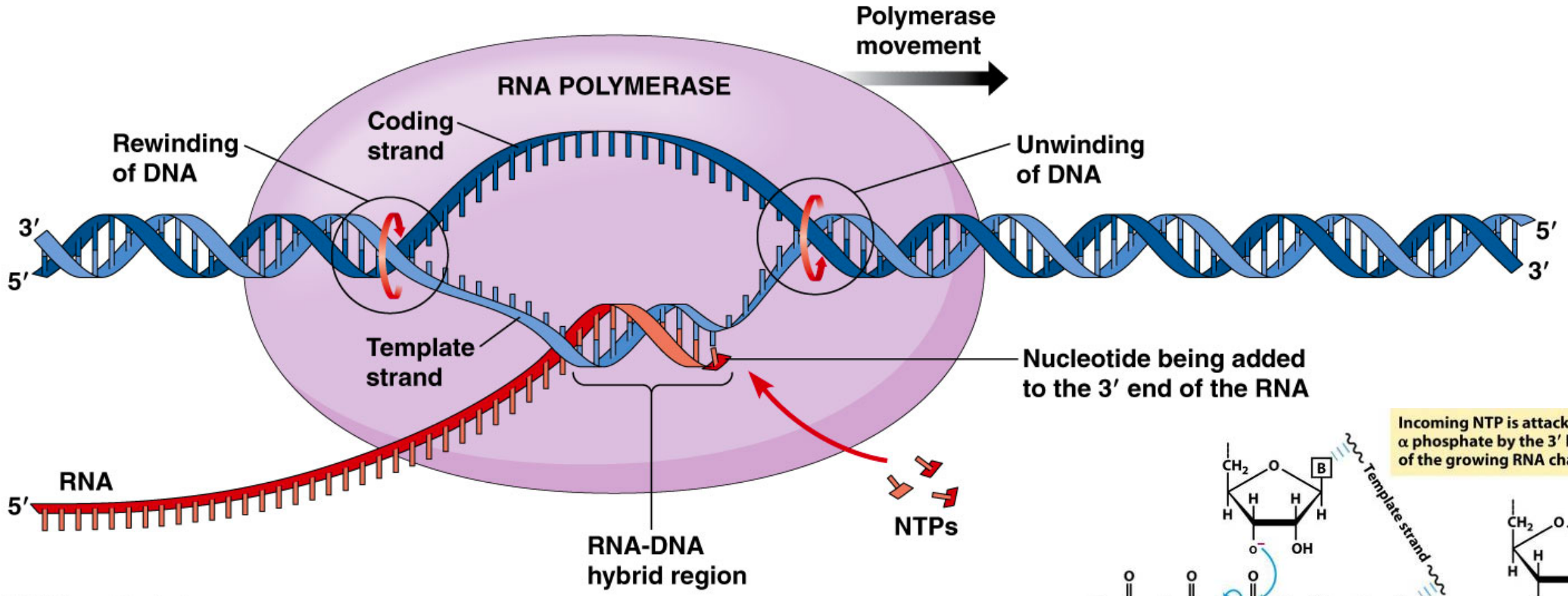
Picosecond Nanosecond Microsecond Millisecond Second Minute Hour Day Week Year Millenium

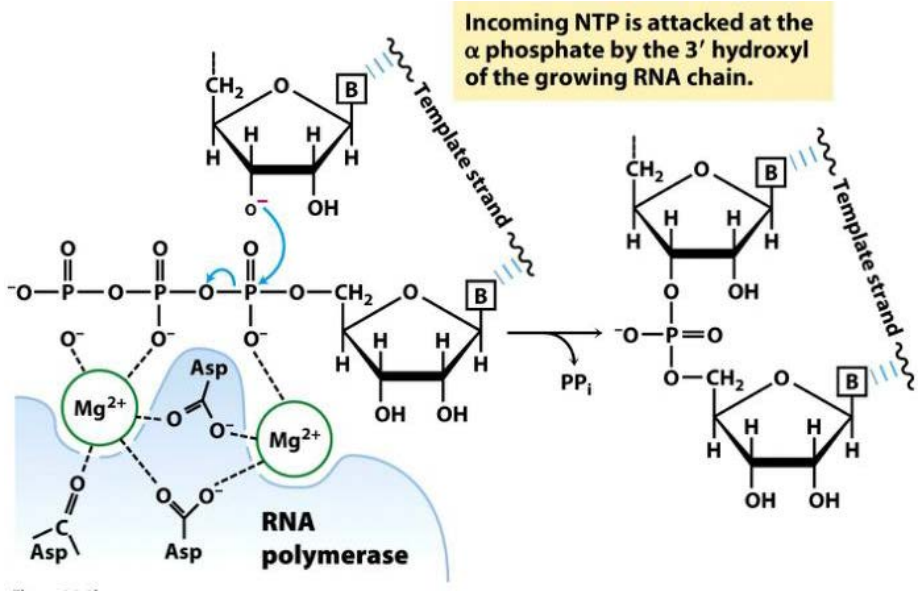
Angstrom Nanometer Micron Meter Kilometer

Flow of Biological Information



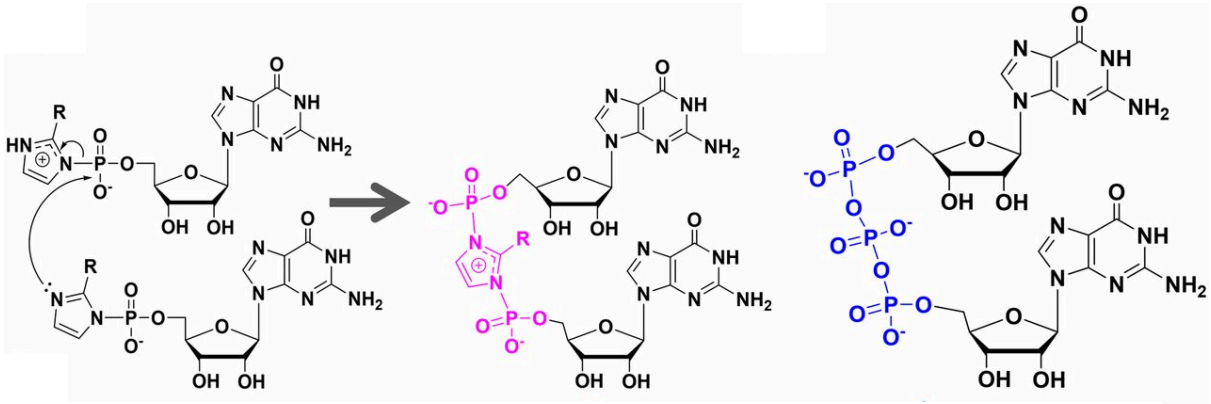
Biological, Enzyme-Catalyzed RNA Replication





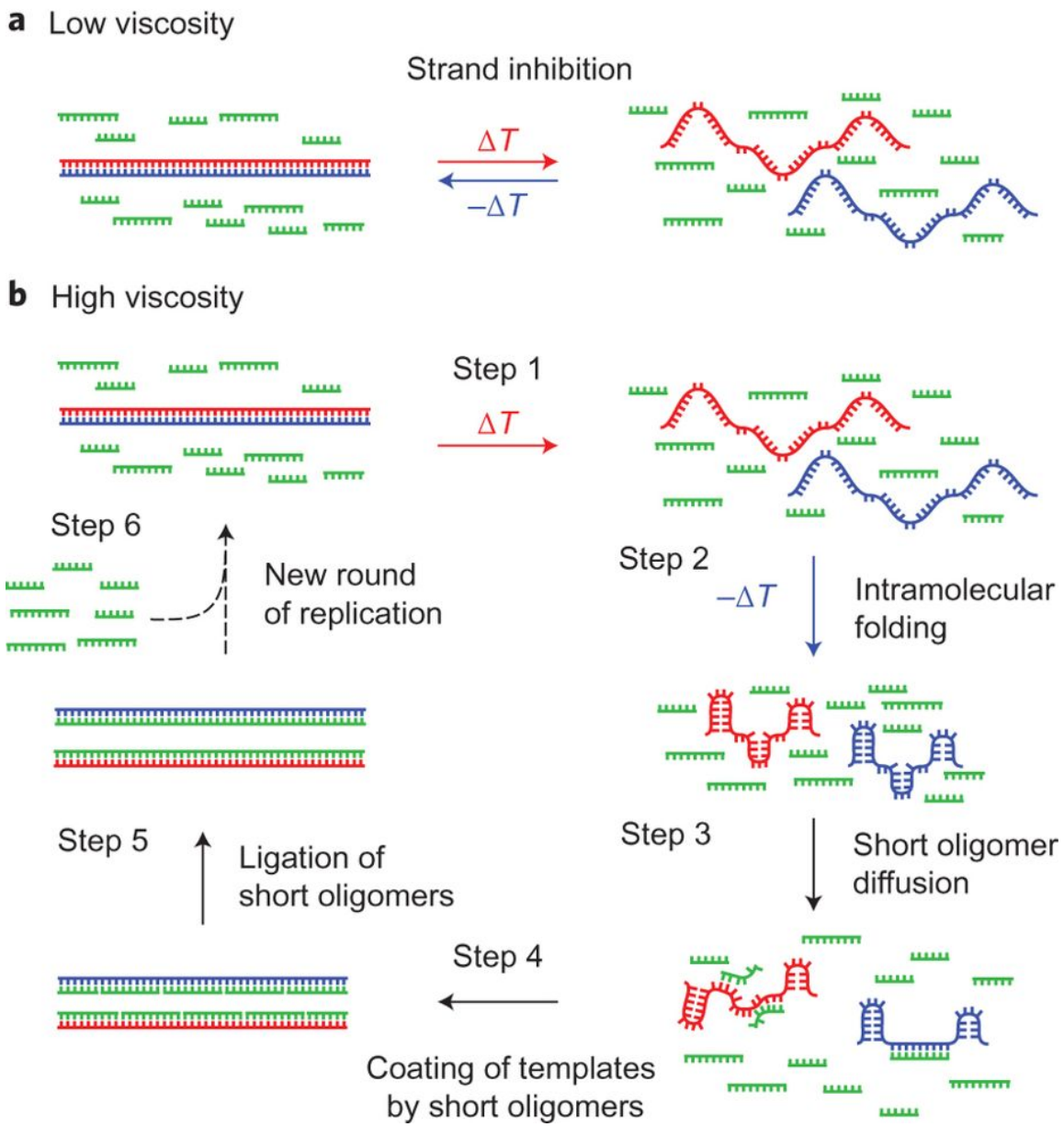
http://www.onlinebiologynotes.com/transcription-in-prokaryotes/; http://image.slideserve.com/516559/rna-synthesis-is-catalyzed-by-the-rna-polymerase-l.jpg

Non Enzymatic RNA Primer Extension



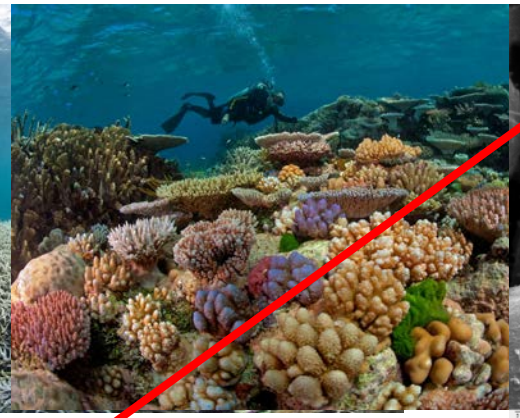
Wen Zhang, Chun Pong Tam, Travis Walton, Albert C. Fahrenbach, Gabriel Birrane, and Jack W. Szostak, *PNAS*, **2017**, 114, 7659-64

Non-Enzymatic Viscosity-Driven Nucleic Acid Replication

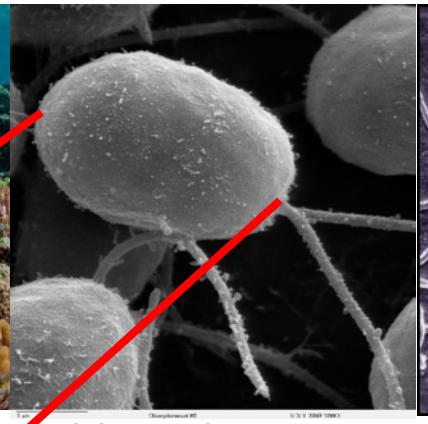


Christine He, Isaac Gállego, Brandon Laughlin, Martha A. Grover & Nicholas V. Hud, *Nature Chemistry*, **2017**, 9, 318–324.

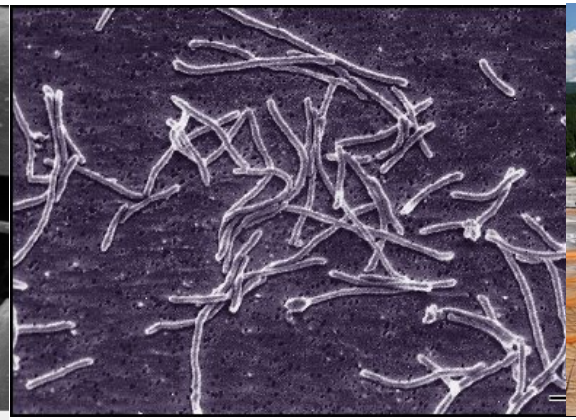
Redox Photochemistry in Genomes of Microorganisms



Coral in Lizard Island Great Barrier Reef

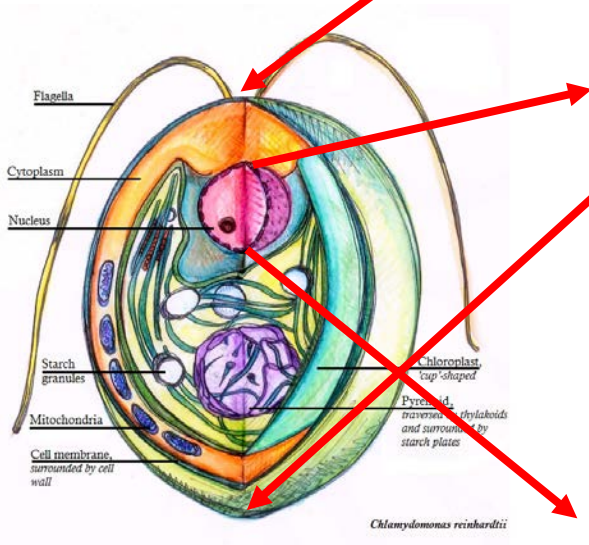


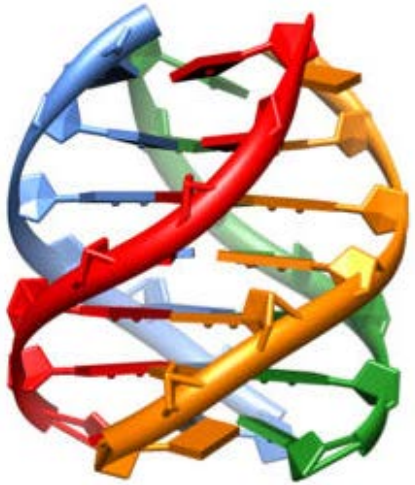
Chlamydomonas algae

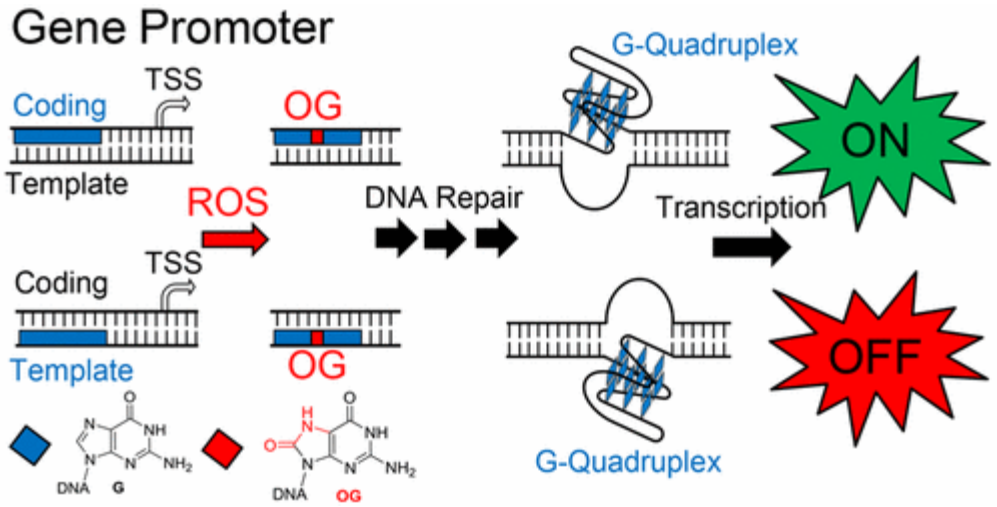


Thermus aquaticus bacteria

Hot springs in Yellowstone National Park







A. M. Fleming, Y. Ding, J. Zhu, and C. J. Burrows, *ACS Chem. Biol.* **2017**, 12, 2417-2426.

https://chem.utah.edu/_images/faculty/burrows/images/publication_images/34.gif; https://news.nationalgeographic.com/2016/03/160321-coral-bleaching-great-barrier-reef-climate-change/; https://en.wikipedia.org/wiki/Chlamydomonas; http://media.web.britannica.com/eb-media/43/134843-004-D231EE08.jpg; https://news.cnrs.fr/sites/default/files/styles/lightbox; hd/public/assets/images/quadruplex_exemples_structures_adn.jpg?itok=S9PkXgjq;

Can Zeroing In Shine Light on the Understanding of the Rules of Life?

Mural by middle school students from Atlanta working with members of the Center for Chemical Evolution @ Georgia Tech.