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### **Engineering the ribosome for expanded polymer biosynthesis**

**Jessica A. Willi**

Department of Chemistry and Biochemistry, University of Lethbridge  
4401 University Drive, Lethbridge, Alberta T1K 3M4, Canada  
[jessica.willi@uleth.ca](mailto:jessica.willi@uleth.ca)

The ribosome is an ancient macromolecule that performs highly accurate, efficient and programmable polymer biosynthesis. However, the ribosome is also highly conserved and resistant to changes. Advances in synthetic biology methods now allow us to use the existing machinery of the ribosome as a starting point to engineer and evolve specialized constructs capable of new and improved synthetic function. Our vision is to alter the machinery of the ribosome to expand beyond canonical protein translation and unlock entirely new modes of polymer synthesis. This talk will focus on our research driving ribosome evolution towards expressing difficult products, accepting non-canonical substrates and expanding the genetic code.

The creation of custom specialized ribosomes is a transformative technology for enhanced protein production and creating novel bioactive compounds, with future industry applications in molecular medicine, nanotech, and protein engineering.