



Apr 14th, 2:35 PM - 3:35 PM

Synthesis of Rare Sugar Molecules: Utilizing Fermentation Biotechnology for the Production of L-Ribose

Melissa Tisoncik, '07
Illinois Wesleyan University

Stephen Hoffmann, Faculty Advisor
Illinois Wesleyan University

David Demirjian, Faculty Advisor
Zuchem, Inc.

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>

Tisoncik, '07, Melissa; Hoffmann, Faculty Advisor, Stephen; and Demirjian, Faculty Advisor, David, "Synthesis of Rare Sugar Molecules: Utilizing Fermentation Biotechnology for the Production of L-Ribose" (2007). *John Wesley Powell Student Research Conference*. 19.
<https://digitalcommons.iwu.edu/jwprc/2007/posters2/19>

This Event is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Poster Presentation P78

**SYNTHESIS OF RARE SUGAR MOLECULES: UTILIZING FERMENTATION
BIOTECHNOLOGY FOR THE PRODUCTION OF L-RIBOSE**

Melissa Tisoncik and Stephen Hoffmann* and David Demirjian*
Chemistry Department, Illinois Wesleyan University
and Zuchem, Inc.

Carbohydrate-based molecular research for biochemical and pharmaceutical companies is becoming increasingly important due to the involvement of carbohydrates in numerous biological functions; including cellular recognition, signaling, and even the development of disease states. The need to access consistent, pure and inexpensive carbohydrate starting materials is also an important factor to consider. This research is focused on the synthesis of one such rare glycochemical L-ribose due to its use in nucleoside-based pharmaceuticals. Zuchem, a biochemical company, has proposed a new synthetic route for the production of L-ribose which utilizes the NAD-dependent mannitol dehydrogenase (MDH) from *Apium graveolens* (garden celery) by specifically converting ribitol to L-ribose through the means of enzymatic oxidation using proprietary fermentation biotechnology. To increase optimization and purity of the L-ribose product through this synthetic route, Zuchem research parameters involve varying MDH zinc dependency, fermentation salt concentrations, and utilizing numerous inexpensive starting materials. In conclusion, this process produced about 90% pure L-ribose fractions for marketing.