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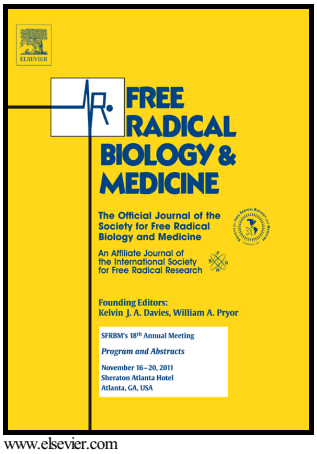

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PII: S0891-5849(18)31028-1
DOI: https://doi.org/10.1016/j.freeradbiomed.2018.06.010
Reference: FRB13806

To appear in: *Free Radical Biology and Medicine*

Received date: 26 March 2018
Revised date: 8 June 2018
Accepted date: 9 June 2018

Cite this article as: Joon Nam, Yonghyun Lee, Yejin Yang, Seongkeun Jeong, Wooseong Kim, Jin-Wook Yoo, Jeon-Ok Moon, Changyong Lee, Hae Young Chung, Min-Soo Kim, Sangyong Jon and Yunjin Jung, Is it worth expending energy to convert biliverdin into bilirubin?, *Free Radical Biology and Medicine,* https://doi.org/10.1016/j.freeradbiomed.2018.06.010

Is it worth expending energy to convert biliverdin into bilirubin?

Joon Nam[a,1], Yonghyun Lee[b,1], Yejin Yang[a], Seongkeun Jeong[a], Wooseong Kim[a], Jin-Wook Yoo[a], Jeon-Ok Moon[a], Changyong Lee[a], Hae Young Chung[a], Min-Soo Kim[a], Sangyong Jon[b], Yunjin Jung[a,*]

[a]College of Pharmacy, Pusan National University, Busan 609-735, South Korea

[b]KAIST Institute for the BioCentury, Department of Biological Sciences, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

***Corresponding author:** Yunjin Jung, College of Pharmacy, Pusan National University, Busan 46241, South Korea; Tel: 051-510-2527; Fax: 051-513-6754; E-mail: jungy@pusan.ac.kr

Abstract

Bilirubin (BR) is generated by the reduction of biliverdin (BV), a metabolite that results from the catalytic degradation of heme by the isoforms of heme oxygenase (HO). BV is nontoxic and water-soluble but BR is potentially toxic and lipophilic. Therefore, a further metabolic step is required for BR before excretion is possible. The reductive conversion of BV to BR costs energy and is evolutionarily conserved in human physiology. There must be a compelling reason for this apparently nonsensical evolutionary conservation. In addition to the differences between BR and BV—such as water solubility, antioxidant activity, and participation as a receptor ligand—in the present study, we focused on the chemistry of the two metabolites with regard to an electrophilic functional group called a Michael reaction

[1] These authors contributed equally to this work