Review of: "Decoding the Promiscuous Activity of Bile Salt Hydrolase"

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Potential competing interests: No potential competing interests to declare.

Overall, this commentary provides valuable insights into the promiscuous activity of BSH and opens up new avenues for understanding bile acid metabolism and its impact on host physiology. The proposed mechanism and suggested future experiments offer a promising direction for further research in this area.

1. Novel enzymatic activity: The study reveals a previously unknown function of bile salt hydrolase (BSH) as an amine N-acyltransferase, capable of conjugating amines to bile acids to form bacterial bile acid amidates (BBAAs). This dual functionality of BSH in bile acid metabolism is a significant discovery.
2. Promiscuous activity explanation: The commentary proposes that BSH exhibits condition promiscuity, where hydrolytic enzymes can catalyze synthetic reactions under specific conditions. This provides a potential mechanism for the observed promiscuous activity.
3. Micellar enzymology connection: The authors draw parallels with micellar enzymology, suggesting that bile salts act as both substrates and micelle-forming agents, creating an environment conducive for BSH to catalyze amidation. This is an intriguing hypothesis that could explain the observed activity.
4. In vivo significance: If the proposed mechanism is correct, this could represent the first in vivo demonstration of condition promiscuity in micellar enzymology. This would be a significant contribution to our understanding of enzymatic reactions in biological systems.