

Bridging Chemistry and Biology: Chemical Biology Strategies for Novel Agrochemical Development

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Ensuring global food security for a growing population remains a paramount challenge, underscoring the critical role of modern, science-based crop protection solutions. These solutions safeguard crop yields against emerging pests, evolving resistance mechanisms, and environmental stresses while improving water and nutrient use efficiency, with a focus on safety and sustainability.

Historically, the development of novel crop protection agents has traditionally been an arduous and resource-intensive undertaking, often relying on serendipitous discoveries or laborious screening campaigns.¹

The integration of chemical biology approaches holds immense potential to revolutionize this process by enabling more efficient target validation and accelerating the discovery of new active ingredients. In crop protection research, chemical biology techniques can be strategically employed to validate the essentiality and druggability of potential targets, providing valuable insights into their biological functions and therapeutic relevance. This knowledge can then guide the design and optimization of lead compounds, ultimately leading to the development of more effective and selective crop protection solutions that meet actual safety and efficacy requirements.

This presentation explores the challenges faced during Lead Generation in crop protection research and highlights how chemical biology tools can aid the development of new active ingredients.

1) G. Berthon, **Where Do Agrochemicals Come From?**, *CHIMIA*, 2020, 74 (10), 822-824.