

# Solving resistance problem in fungicides: Example of complex III mitochondrial respiration inhibitors

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*Keywords: Crop Protection compounds, natural and synthetic biologically active small molecules, fungicides, mitochondrial respiration, resistant strains*

Firstly, the challenge of food supply will be swiftly presented, and the importance of crop protection compounds will be highlighted. The diverse ways to protect crops will be shown with a focus on natural and synthetic small molecules. Biocontrol paradigm will be introduced.

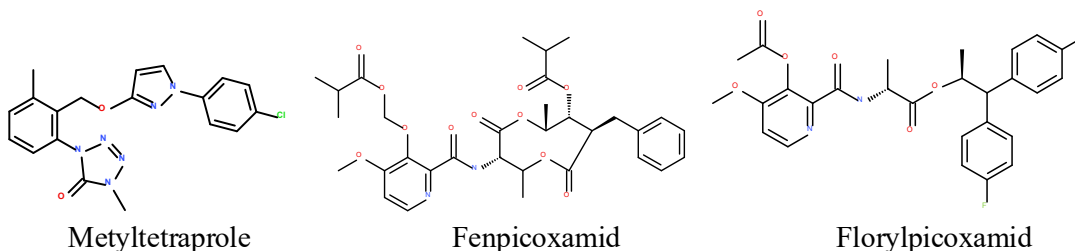
Small molecules active ingredient research methodologies will be introduced with analogies to the pharmaceutical industry.

The emphasis will be put on the (eco)toxicological hurdles to overcome to be able to register such compounds.

Main phytopathogenic fungi will be shortly described.

The current status on worldwide used strobilurines synthetic fungicide chemical class and the rationale to search for new ones active on the mitochondrial respiration at the complex III level will be given. The general Structure / Activity Relationship will be highlighted linked to the interaction of the compounds with their biochemical target.

Following the development of resistance, the discovery of new compounds active either on the same site (metyltetraprole, Sumitomo) or at a different one in the same complex III (bioinspired fenpicoxamid and florylpicoxamid, Corteva Agriscience), both presenting a high biological efficacy on resistant strains will be told. The chemical synthetic challenges for their large-scale production will be detailed.



Finally, take home messages will be given with an opening to future technologies that could be used and the role of scientists in tomorrow's crop protection.