

## From phosphorus and sulfur – multicomponent and one pot reactions

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Investigating the main trends in organic and medicinal chemistry, recent studies presented that only a small number of organic molecules from the whole chemistry space with poor variety have already been prepared and a limited number reactions dominate among synthetic applications. Therefore, it is highly encouraged to develop innovative chemistries, and moreover, in order to expand the boundaries in reaction parameters, new technologies are also emerging. Besides, the “green” applications in organic synthesis (atomic efficiency, one-pot procedures, selective reactions) are getting important in laboratory and also in industrial practice.

The main goal of our research was the development of new synthetic pathways to potentially biologically active compounds and new heterocyclic cores through multicomponent/one – pot/cascade reactions. We show the applications of Bischler-Napieralski, Pictet-Spengler, Biginelli, Willgerodt-Kindler, Kabachnik-Fields and Betti reactions. We have discovered new applications of the efficient reagent T3P<sup>®</sup>, developed multicomponent aqueous reactions using elemental sulfur as the sulfurating agent and used microwave and flow chemistry to improve the synthetic efficiency. During these studies we have developed new synthetic pathways to nuevamine, harmalan and eudistomin alkaloids in addition to thiocarlide a drug used against tuberculosis.

