

Hydrazones: simple yet powerful bioactive compounds

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Along with relatively easy synthesis as well as structural diversity, hydrazones are an important class of biologically active compounds with a broad spectrum of biological activity, including antimicrobial, anti-inflammatory, anticonvulsant as well as anticancer activity or anti-Alzheimer's effect. Due to their metal-binding ability, they can serve as therapeutics in the treatment of iron overload diseases or metal poisoning. Mechanism of action is based on several processes, including chelation of metal ions, intercalation, inhibition of enzymes (ribonucleotide reductases, histone deacetylases, acyl transferases, caspases, TET proteins), disruption of cell-to-cell communication, or production of reactive oxygen species.

In an attempt to find new potent and selective agents, novel hybrid compounds bearing two or more pharmacophores are developed using a molecular hybridization approach. It allows preparing compounds that can affect multiple targets and utilize a combination of several different mechanisms of action.