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Rational Strategies for the Synthesis of Novel Imidazole Heterocycles and Their Diverse Pharmacological Activities: A Concise Review

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Abstract: Imidazole-based heterocycles have gained significant attention due to their diverse pharmacological properties and broad-spectrum biological activities. This review explores rational strategies for the synthesis of novel imidazole derivatives, emphasizing innovative synthetic approaches, green chemistry methodologies, and catalyst-assisted transformations. The discussion also highlights the structure-activity relationships (SAR) that govern their therapeutic potential, including antimicrobial, anticancer, anti-inflammatory, and antiviral properties. By understanding the key synthetic pathways and reactivity of imidazole scaffolds, researchers can design and develop new bioactive molecules with enhanced efficacy and selectivity.

Keywords: Imidazole Heterocycles, chemistry methodologies



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