

# **Reliability in Nano-Engineering: Nuclear Spin of Magnesium-25 as Reliability Factor in Biomolecular Nanoreactors**

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The trend of nanoscaling brings engineering down to the dimensions of molecular structures. However, it also poses the problem of how to create a reliable system from molecular components which experience permanent thermal and environmental fluctuations. Fortunately, engineers may learn wisdom by the examples of Nature (“bionics”), to achieve the high systems reliability while dealing with unreliable components. Magnetic isotope effect is a new trend in free radical science. The discovery of the magnetic isotope effects of magnesium-25 in biochemical reactions has become another breakthrough of great importance. This paper is a brief review of recent developments in this field highlighting promising venues for future research and application of the stable magnetic isotopes as the potent tools for control over efficiency and reliability (robustness) of biomolecular nanoreactors.

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