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The influence of the environment and drugs against the ageing process

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In many laboratories across the world there are projects aiming to develop effective therapies against age-associated conditions. Pharmaceuticals and nutraceuticals are being evaluated and offered for consumption by the public on a regular basis. New and not-so-new compounds attract attention as possible 'longevity elixirs' and examples include resveratrol, metformin, mTOR modulators, calorie restriction mimetics, NAD+, carnosine and many others. Although there is some merit in using such agents in an attempt to lessen the impact of age-associated chronic dysfunction, there is no evidence to suggest that these remedies will lead to the elimination of ageing. There are several reasons for this but an important one is that we need to evaluate such compounds not in isolation, but in relation to the human environment. This means that societal and cultural elements come into consideration, in addition to the pharmaceutical ones. Research shows that compounds may have different effects if these are evaluated in the social context of the patient, and other effects if considered in pharmacological isolation. If we want to eliminate age-associated dysfunction and achieve radical life extension, we need to move away from simple drug models and study instead complex scenarios which take into account socio-cultural and techno-cultural aspects.

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Novel bioconjugate carriers as drugs Ver. 3.0: Design language, merits and bench to bedside transformation

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Observing the research and development for novel and innovative drug carrier systems in the past fifteen years has been thrilling and exciting. The research trend moving from prodrug technologies based on minimal chemical modifications to comply Lipiniski rule of five (Drugs Ver 1.0), to novel nano-carriers such as nanoparticles, nanoemulsaions, vesicular systems and polymeric and peptidomemetic systems (Drugs Ver 2.0) to finally novel bioresponsive smart bioconjugates (Drugs Ver 3.0). This review would focus on novel smart bioconjugates, current innovations in its design language, advantages, industrialization, scaling-up, current patent status and its transformation from bench (Lab. small scale production) to bedside (industrial manufacturing stage). Finally, this review will focus on the role of pharmaceutical formulators in transitioning novel bioconjugates from synthetic chemical compounds to final dosage forms, overcoming the hurdles of synthesis reproducibility and purity of the final bioconjugates and the associated adjuvants used in the chemical synthesis. Innovative and updated strategies in formulation design and development are required to take bioconjugate systems efficiently from bench to bedside.

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