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Ensuring sufficient intracellular ATP supplying and friendly extracellular ATP signaling attenuates stresses, delays senescence and maintains quality in horticultural crops during postharvest life

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**Abstract**

*Background:* As universal energy currency, intracellular ATP (iATP) shortages in horticultural crops during postharvest stresses and senescence. In addition to function as intracellular energy currency, ATP serves as friendly extracellular signaling molecule (eATP). *Scope and approach:* Postharvest treatments attenuate stresses, delay senescence and maintain quality in horticultural crops by ensuring sufficient iATP supplying, which was accompanied with lower phospholipase D (PLD) and lipoxygenase (LOX) enzymes activity concomitant with higher antioxidant system activity which along with higher heat shock proteins (HSPs) accumulation resulting in lower reactive oxygen species (ROS) accumulation leading to higher membrane unsaturated/saturated fatty acids (unSFA/SFA), higher shikimate and phenylpropanoid pathways activity revealing by higher phenylalanine ammonia lyase (PAL) enzyme activity leading to higher phenols accumulation, higher endogenous proline and glycine betaine accumulation, higher endogenous polyamines accumulation, and higher pathogenesis (PRs) proteins accumulation, which are crucial for membrane fluidity and integrity maintaining and cell wall fortification. In addition to intracellular energy currency, friendly eATP signaling is crucial for promoting iATP biosynthesis machinery activity and reinforcing defense response by triggering jasmonic and salicylic acids signaling pathways. Also, friendly eATP signaling not only is crucial for regulating stomatal closure which is pivotal for attenuating stresses and delaying senescence in horticultural crops but also is crucial for postharvest biofactories representing high phenols accumulating fresh horticultural crops in response to abiotic stresses which are beneficial for human health. *Key findings and conclusions:* Ensuring sufficient iATP supplying and

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