Does inhibition of poly(ADP-ribose) polymerase prevent energy overconsumption under microgravity?

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When plants are exposed to a stress signal, they expend a lot of energy and exhibit enhanced respiration rates. This is partially due to a breakdown in the NAD^+ pool caused by the enhanced activity (PARP), which uses NAD^+as a substrate to synthesize polymers of ADP-ribose. Stress-induced depletion of NAD^+ results in a similar depletion of energy, since ATP molecules are required to resynthesize the depleted NAD^+. It seems that plants with lowered poly(ADP ribosyl)ation activity appear tolerant to multiple stresses. Inhibiting PARP activity prevents energy overconsumption under stress, allowing normal mitochondrial respiration. We intend to study if the microgravity is perceived by plants as a stress factor and if experimental inhibition of poly(ADP-ribose) polymerase may improve the energetic level of the cells.

References

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