

# Abstract

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## Vitamin B6 conjugation to nuclear corepressor RIP140 and its role in gene regulation.

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**BACKGROUND:** Pyridoxal 5'-phosphate (PLP), the biologically active form of vitamin B6, is an important cofactor in amino acid metabolism, and supplementary vitamin B6 has protective effects in many disorders. Other than serving as a cofactor, it can also modulate the activities of steroid hormone receptors and transcription factors. However, the molecular basis of this modulation is unclear.

**OBJECTIVE:** Here, we report that mouse nuclear receptor interacting protein 140 (RIP140) can be modified by PLP conjugation.

**METHODS:** We mapped the modification site to Lys613 by LC-ESI-MS/MS analysis.

**RESULTS:** This modification enhanced its transcriptional corepressive activity and its physiological function in adipocyte differentiation. We attribute this effect to increased interaction of RIP140 with histone deacetylases and nuclear retention of RIP140.

**CONCLUSION:** This study uncovers a new physiological role of vitamin B6 in gene regulation by PLP conjugation to a transcriptional coregulator, which represents a new function of an old form of protein post-translational modification that has important biological consequences.

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