

Data from: Joining up the scattered anticancer knowledge on auraptene and umbelliprenin: A meta-analysis

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Abstract

Auraptene (AUR) and umbelliprenin (UMB) are naturally occurring prenylated coumarins that have demonstrated promising anticancer effects across various human cancer cell lines. This meta-analysis aimed to systematically assess, compare, and quantify the anticancer efficacy of AUR and UMB by synthesizing evidence from in vitro studies. A comprehensive literature search identified 27 eligible studies investigating AUR or UMB against cancer cells. Mixed-effects models revealed significant negative associations between coumarin dose and viability for AUR (est. = - 2.27) and UMB (est. = - 3.990), underscoring their dose-dependent cytotoxicity. Meta-regression indicated slightly higher potency for UMB over AUR, potentially due to increased lipophilicity imparted by additional isoprenyl units. Machine learning approaches identified coumarin dose and cancer type as the most influential determinants of toxicity, while treatment duration and the specific coumarin displayed weaker effects. Moderate (AUR) to substantial (UMB) between-study heterogeneity was detected, although the findings proved robust. In summary, this meta-analysis establishes AUR and UMB as promising natural anticancer candidates with clear dose-toxicity relationships across diverse malignancies. The structural insights and quantifications of anticancer efficacy can inform forthcoming efforts assessing therapeutic potential in pre-clinical models and human trials.

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