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摘要(中)	粒線體呼吸酵素複體 IV (Cytochrome c oxidase；COX)是電子傳遞最終催化中心，是由許多次單元所構成，調節粒線體膜電位及細胞程式凋亡，並與老化及粒線體疾病等氧化壓力相關。葉酸缺乏導致氧化壓力是否直接影響 COX 活性及其調節機制目前未明。本研究以細胞培養及動物模式，探討葉酸營養對大鼠肝臟粒線體氧化壓力、COX 活性及其調節機制。將大鼠肝癌細胞株(H-4-II-E)培養於葉酸缺乏培養液，以流式細胞儀分析顯示胞內活性氧物種顯著升高，COX 活性降低。補充葉酸降低胞內氧化壓力及回復 COX 活性。投予 Wistar 大鼠葉酸缺乏(0 mg/kg diet)飲食，收集肝臟粒線體評估氧化壓力，粒線體麩胱??過氧化?顯著低於對照組。本研究進一步探討葉酸對 COX 活性之調節機制，葉酸缺乏是否造成 COX 基因氧化性鹼基突變。主導 COX 催化功能性的三個次單元 COX I，COX II 及 COX III 是由粒線體 DNA 轉錄，基因定序結果顯示葉酸缺乏並無在此三個次單元造成 T→C 或 G→A 氧化性鹼基突變。粒線體 DNA 大片段斷損與氧化壓力有關，其中 COX III 基因座落此斷損中，斷損比例會影響 COX III 基因含量。利用即時定量聚合?連鎖反應發現葉酸在氧化壓力下不影響粒線體 DNA 斷損程度，推測 COX 活性可能不受大片段斷損的影響。利用即時聚合?連鎖反應 SYBR Green I 螢光標定方式偵測 COX 次單元基因表現，葉酸缺乏向上調節 COX III、COX VI、COX V、cytochrome c 與粒線體 DNA 複製因子 NRF-1 (nuclear respiratory factor 1)、mtTFA (mitochondria transcription factor)、mtSSB (mitochondria DNA binding protein)、Pol γ (DNA polymerase γ)等基因表現，但粒線體呼吸酵素複體次單元 COX IV 蛋白質則不受影響。綜合上述，葉酸降低 COX 活性的機制，不在調節氧化性鹼基突變、DNA 大片段斷損、基因及蛋白質表達，顯示可能是由葉酸缺乏導致氧化壓力直接影響 COX 酵素催化功能性。
摘要(英)	
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	鼠初代肝細胞細胞色素 c 氧化?活性之影響……..…...73 表目錄 頁次 表一、本實驗設計所使用之引子與探針序列及其相對應位置……..…56 表二、反轉錄聚合?鏈鎖反應所使用之引子序列及其相對應位置…. 57 表三、葉酸缺乏對大白鼠肝臟粒線體抗氧化酵素之影響.....….66
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