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• 計畫中文名稱	臺灣烏腳病盛行地區高血壓、糖尿病與砷誘發之活性氧物種與抗氧化防禦系統之相關性研究
• 計畫英文名稱	The Relationship between Arsenic Induced Reactive Oxygen Species, Antioxidant Defense System and Hypertension and Diabetes in Blackfoot Disease Hyperendemic Area in Taiwan
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• 中文關鍵字	砷；高血壓；含錳超氧歧化胺；烏腳病流行區；基因多形性
• 英文關鍵字	Arsenic；Hypertension；Manganese superoxide dismutase (MnSOD)；Blackfoot disease endemic area；Gene polymorphism
• 中文摘要	針對烏腳病盛行地區探討含錳超氧歧化酵素(MnSOD)基因多形性和高血壓之間的關係。以 30 歲以上並且每週居住在研究地區至少五天的居民作爲研究對象，並利用 78 年收集的資料以及 78-86 年間所採集的生物檢體。兩位公共衛生護士以結構式問卷訪視每位研究對象，問卷內容包括社會人口學資料、抽菸與喝酒習慣、職業史、居住史、飲水史與家族疾病史等項目。血球萃取出之 DNA 利用聚合酵素連鎖反應及限制片段長度多形性分析含錳超氧歧化酵素粒線體目標序列 Val/Ala 變異。利用高效率液相層析儀分析血清中微量營養元素包括維生素 A、維生素 E、蕃茄紅素、β-胡蘿蔔素。調整年齡、性別、身體質量指數、累積砷暴露等重要危險子後，含錳超氧歧化酵素基因型爲 Val/Ala 和 Ala/Ala 者不論三酸甘油脂及維生素 E 濃度爲何，危險對比值有上升趨勢。調整合錳超氧歧化酵素基因型等其他重要危險因子之後，不論內皮一氧化氫合成酵素基因型是 Glu/Glu 或 Glu/Asp 和 Asp/Asp 者，隨著累積砷暴露或身體質量指數的增加，高血壓危險性顯著增加。調整了年齡和性別後，帶有 Val/Val 基因型且累積砷暴露越低、身體質量指數正常、三酸甘油脂濃度越低者，高血壓的相對危險性有下降的趨勢。因此本研究推論含錳超氧歧化酵素基因多形性可能定高血壓基因上的一個易感受性因子，基因型的不同可能修飾個體罹患高血壓的危險性，而後天環境的暴露、生活及飲食習慣更是影響高血壓相當重要的危險因子。
• 英文摘要	The relationship between hypertension and manganese superoxide dismutase (MnSOD) gene polymorphism has been studied in the blackfoot disease endemic area. The study subjects who were over 30 years old and lived at least 5 days a week in the three villages were recruited. The data of study subjects were collected in 1989 and biological samples were obtained from 1989 to 1997. Two well-trained public health nurses performed a standardized personal

interview based on a structured questionnaire. Information obtained from the interview included demographic characteristics, alcohol drinking and cigarette smoking, working and residential history, history of well water consumption as well as family history of hypertension. Moreover, DNA was extracted from buffy coat to analyze the Val/Ala variant in the mitochondrial targeting sequence in MnSOD gene utilizing polymerase chain reaction (PCR) and restriction fragment length polymorphism (RFLP). Serum was measured for all trans-retinol, α-tocopherol, lycopene, β-carotene by high performance liquid chromatography (HPLC). After adjustment for age, sex, body mass index (BMI) and cumulative arsenic exposure, MnSOD Val/Ala and Ala/Ala genotype people had higher relative risk than MnSOD Vat/Val genotype people in any concentration of triglyceride and vitamin E. After adjustment for MnSOD genotype and other important risk factors, The relative risk of hypertension was significantly increased with cumulative arsenic exposure or BMI increasing whether eNOS Glu/Glu genotype or Glu/Asp and Asp/Asp genotype. The relative risk of hypertension for MnSOD Val/Val genotype people in lower cumulative arsenic exposure, normal BMI and lower triglyceride level was decreased after age and sex were adjusted. The results of this study suggested that MnSOD gene polymorphism may be a genetic susceptible factor of hypertension and MnSOD genotype may modify individual hypertension risk. Acquired environment exposure, life style and dietary habit were also very important risk factors for hypertension.