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• 計畫英文名稱	Effects of Arginine Supplementation on Immune Response and Nutrients Metabolism in Thermal Injured Mice (II)
• 主管機關	行政院國家科學委員會
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• 研究人員	葉松鈴 Yeh, Sung-Ling
• 中文關鍵字	燒傷; 精胺酸; 抗氧化酵素活性; 抗體; 疫苗接種; 綠膿桿菌
• 英文關鍵字	Burn; Arginine; Antioxidant enzyme activity; Antibody; vaccination; Pseudomonas aeruginosa
• 中文摘要	本年度計畫探討 Arg 添加對燒傷時特異性抗體產生，及 T 淋巴球分布情形之影響。由於燒燙傷病患最常被綠膿桿菌(Pseudomonas aeruginosa)感染，本研究以綠膿桿菌疫苗在燒傷前注入，來研究燒傷前後不同時間點特異性綠膿桿菌抗體產生之情形。實驗以剛斷奶之雄性 BALB/c mice 爲對象，將老鼠分成 2 組，一組添加 2% 的 Arginine，另一組以等氮量之 Glycine 取代之，兩組除添加之胺基酸不同外，其餘飼料組成均完全相同。實驗開始前先眼窩採血當成測量抗體之基準值，並將綠膿桿菌疫苗(PEIF)注入老鼠背部皮下，在第四週時給予第二次疫苗注射，實驗期共 7 週。在第七週結束時將老鼠引致 30%燒傷，並於燒傷後 24 小時犧牲取血及器官，測定 T 淋巴球分布情形，及各不同時間點抗體產生之情形。結果顯示在 T 淋巴球分布方面，不論是 CD3,CD4,CD8 在兩組之間均無差異。特異性綠膿桿菌抗體之產生，則在燒傷前的各時間點及燒傷後 Arg 添加組均顯著較控制組高。結果也顯示 Arg 添加組其肝、腎中抗氧化酵素活性，及過氧化物產生量均顯 著較控制組爲低。此結果顯示 Arg 之添加有促進體液性免疫反應之作用，但 CD4 T 細胞之增生可能不是特異性抗體產生之原因。對注射綠膿桿菌疫苗的老鼠而 言，Arg 之添加仍然有減少因燒傷引致氧化壓力增加的情形，而體液性免疫反應 增強可能在降低燒傷時氧自由基之產生上扮演一個角色。
• 英文摘要	This study investigated the effect of arginine (Arg) supplementation on specific antibody production and antioxidant enzyme activities in burned mice vaccinated with detoxified Pseudomonas exotoxin A linked with the outer membrane proteins I and F, named PEIF. Fifty BALB/c mice were assigned to 2 groups. One group was fed a control diet with casein as the protein source, while the other

group was supplemented with 2% Arg in addition to casein. The 2 groups were isonitrogenous. The mice were immunized twice with PEIF, and the production of specific antibodies against PEIF was measured every week. After 8 weeks, all mice received a 30% body surface area burn injury. Mice were sacrificed 24h after the burn. The antioxidant enzyme activities and lipid peroxides in the tissues as well as the specific antibody production were analyzed. The results demonstrated that there were no significant differences in CD3, CD4 and CD8 T cell populations between the 2 groups. The production of specific antibodies against P. aeruginosa significantly increased in the Arg group at 4 and 7 weeks after immunization, and 24 h after the burn. Antioxidant enzyme activities and lipid peroxides in tissues were significantly lower in the Arg group than in the control group after the burn. These results suggest that vaccinating mice with Arg supplementation may enhance humoral immunity and attenuate the oxidative stress induced by burn injury.