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• 計畫中文名稱	放射性半胱胺酸鍀錯化合物的研製---腎臟照影劑的研發與其代謝的研究
• 計畫英文名稱	A Study on Tc-Cysteine Complexes---Investigation of Renal Radiopharmaceutical and Metabolism.
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• 研究人員	王愛義 Wang, Ai-Yih
• 中文關鍵字	半胱胺酸鍀錯化合物；代謝機制；腎照影劑
• 英文關鍵字	Tc-cysteine complex；Metabolic mechanism；Renal imaging agent
• 中文摘要	本實驗的主要目的是對半胱胺酸鍀錯化合物(/sup 99m/Tc-cysteine complex 進行一系列的研究,包括:錯化合物所的電性、不同 pH 值下脂溶性的改變和動物實驗等。其中動物實驗主要是探討半胱胺酸鍀錯化合物在血液中的清除速率。排泄速率及運輸機制,並以 2,4-dinitrophenol 或 Probenicid 來探討其在動物體的排泄機制,最後再以活體照影來評估其作爲腎臟照影劑的可行性。 半胱胺酸與鍀錯化合物的過程,其標幟效率約在反應 10 分鐘後即可達到 95 以上(符合核醫品管的要求)。從分析半胱胺酸鍀錯化合物發現其帶負電荷,且其水溶性極高,故可預期它會由腎臟排出體外。在動物實驗中可發現它在血液中的清除速率非常快,在注射後 1 小時內,有 80%的活性會由腎臟排泄,且排泄的過程會受抑制藥劑(2,4-DNP 或 Probenicid)的抑制。由此可證實半胱胺酸鍀錯化合物是由腎小管分泌排出體外。利用高效率液體層析及 SDS-PAGE 可證實它在血液中的攜帶蛋白爲白蛋白,且它在代謝過程,並未經過分解及從尿中排出。從活體的照影中更可直接證實半胱胺酸鍀錯化合物適合作腎動態照影的藥劑。故從本實驗的結果可發現半胱胺酸鍀錯化合物確實有成爲新核醫腎臟照影劑的能力。
• 英文摘要	The characterization of /sup 99m/Tc-cysteine complex was studied in this research. Several experiments were explored to evaluate the characterization, namely, the charge, water/octanol partition coefficiency at various pH, and animal experiment. The in vivo studies include: blood clearance of Tc-cysteine complex, transport mechanism, urinary excretion, and the inhibition of tubular transport inhibitor (2, 4-dinitrophenol, probenecid), finally the in vivo image was carried out to evaluate the probability of Tc-cysteine as a renal image agent. The labelling efficiency of Tc-cysteine was above 95% after 10 minutes' reaction. Tc-cysteine is a complex with negative charge, high hydrophilic, it can excrete from kidney, expectantly. The blood clearance of Tc-cysteine complex is very fast, about 80% of injected activity excreted from kidney at 1 hour postinjection. From the result, it suggests that the serum albumin is a

carrier for the transport of Tc-cysteine complex to kidney, then eliminated by tubular secretion, and it was excreted without any dissociation during the metabolic process. From the result of in vivo image, Tc-cysteine is a remarkably renal dynamic imaging agent, it has potential to be a new renal imaging radiopharmaceutical.