

Synthesis of 5- [¹²³I]iodoarabinosyl Uridine and 3-[¹⁸F]-FLT Analog and their Cell Uptake Assay

俞鐘山

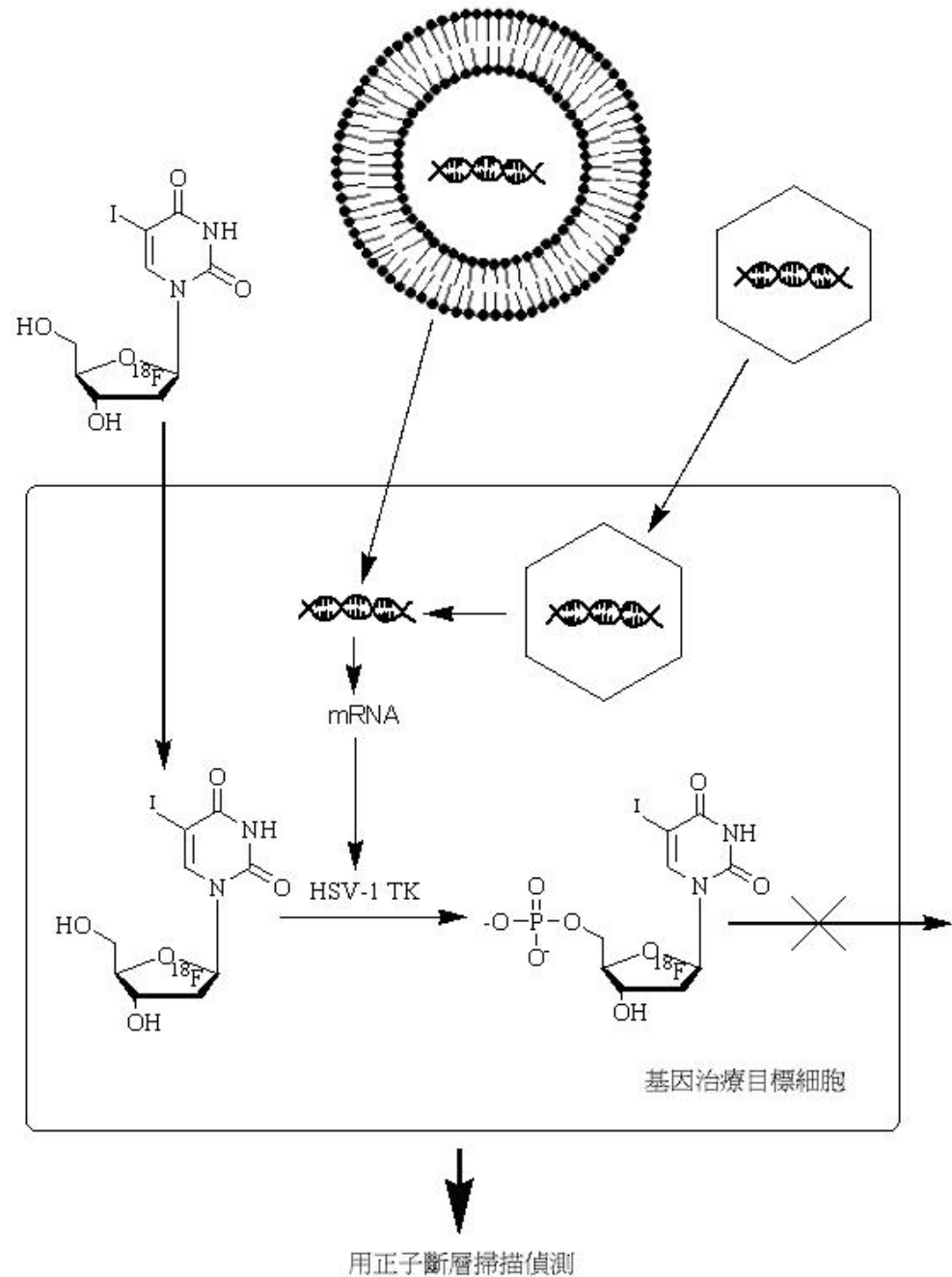
國立清華大學
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醫藥化學實驗室

HSV-tk 基因治療 探針原理

Deng WP, Wu CC, Lee CC,
Yang WK, Wang HE, Liu
RS, et. al
2006

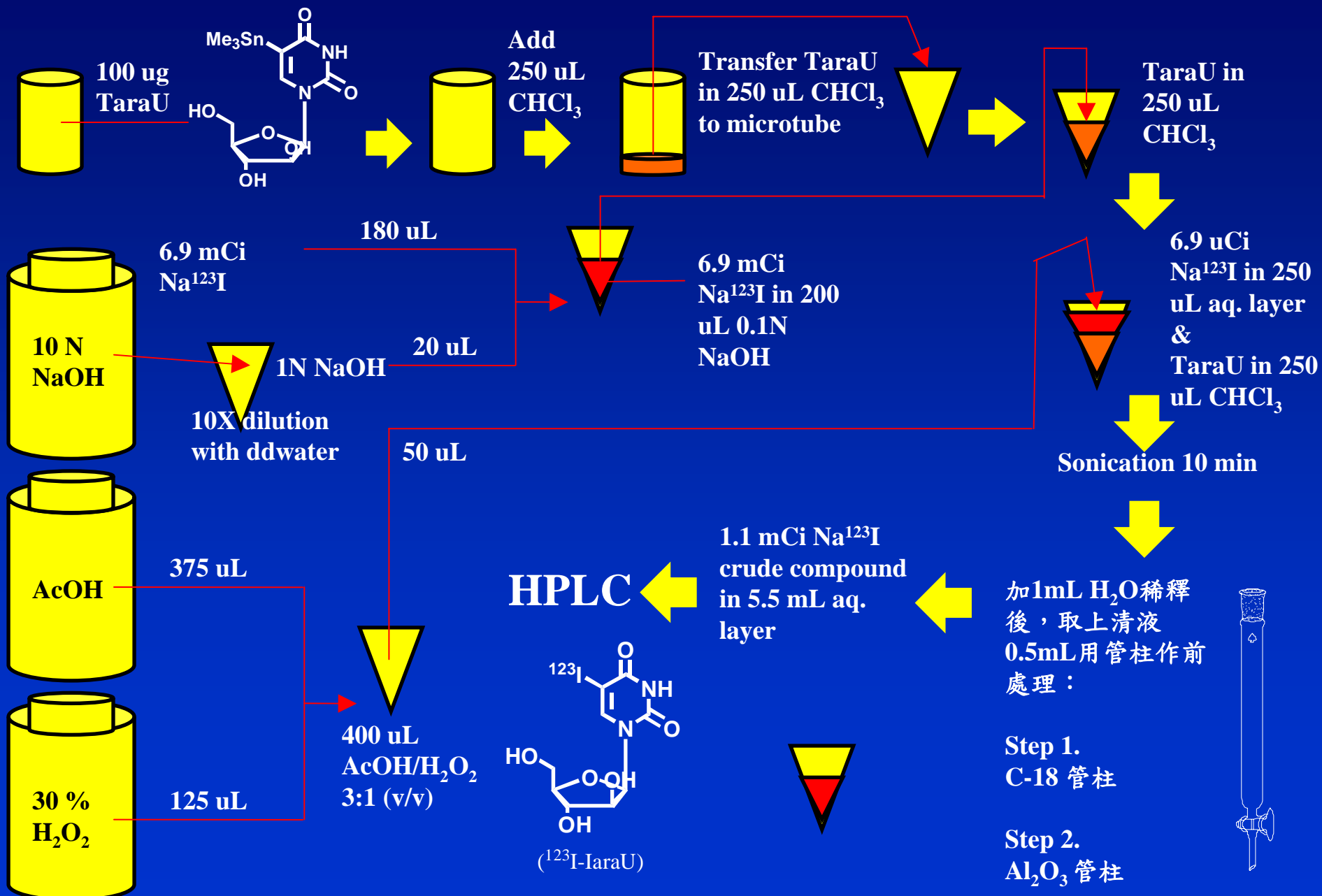
Serial in vivo imaging of the
lung metastases model and
gene therapy using HSV1-tk
and ganciclovir

J Nucl Med 47 877-84

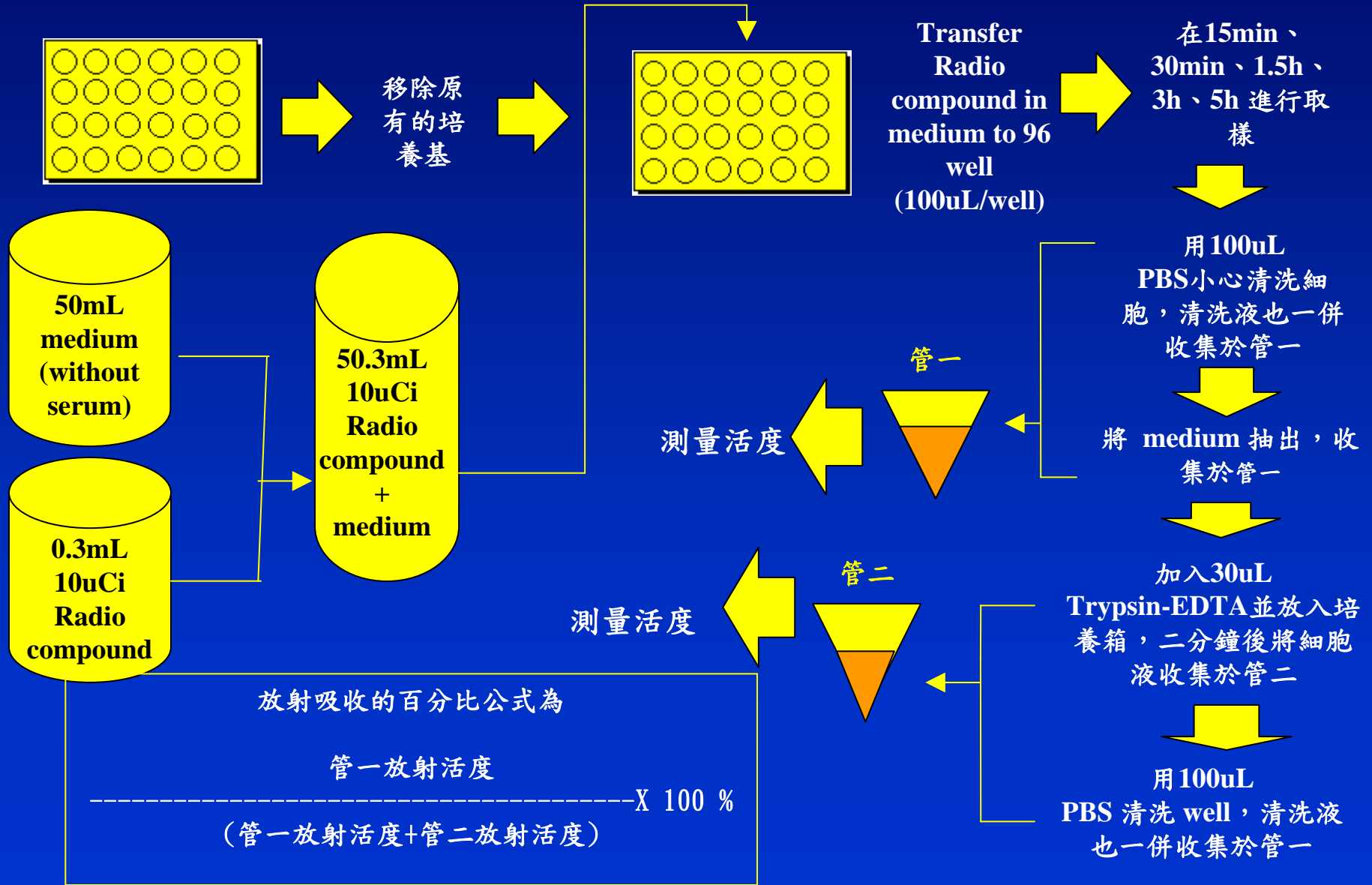


[¹²³I]IaraU 標誌步驟細節

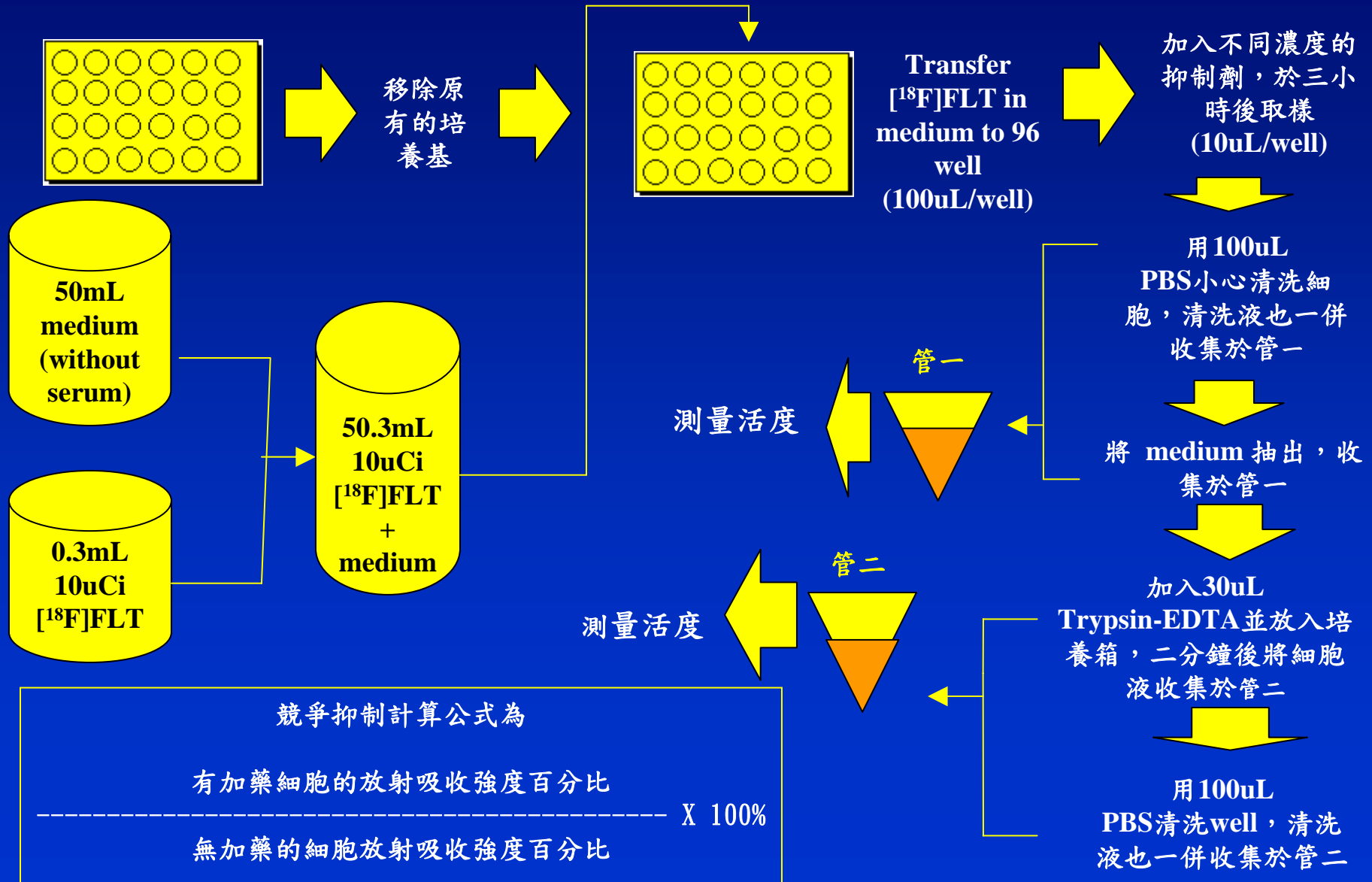
(Yu, C.-S.; Chiang, L.-W.; Wu, C.-H.; Wang, R.-T.; Wang, H.-Y.; Yeh, C.-H. *Nucl. Med. Biol.* 2006, 33, 367.)



細胞放射吸收實驗 (^{123}I -IaraU/ ^{18}F FLT)

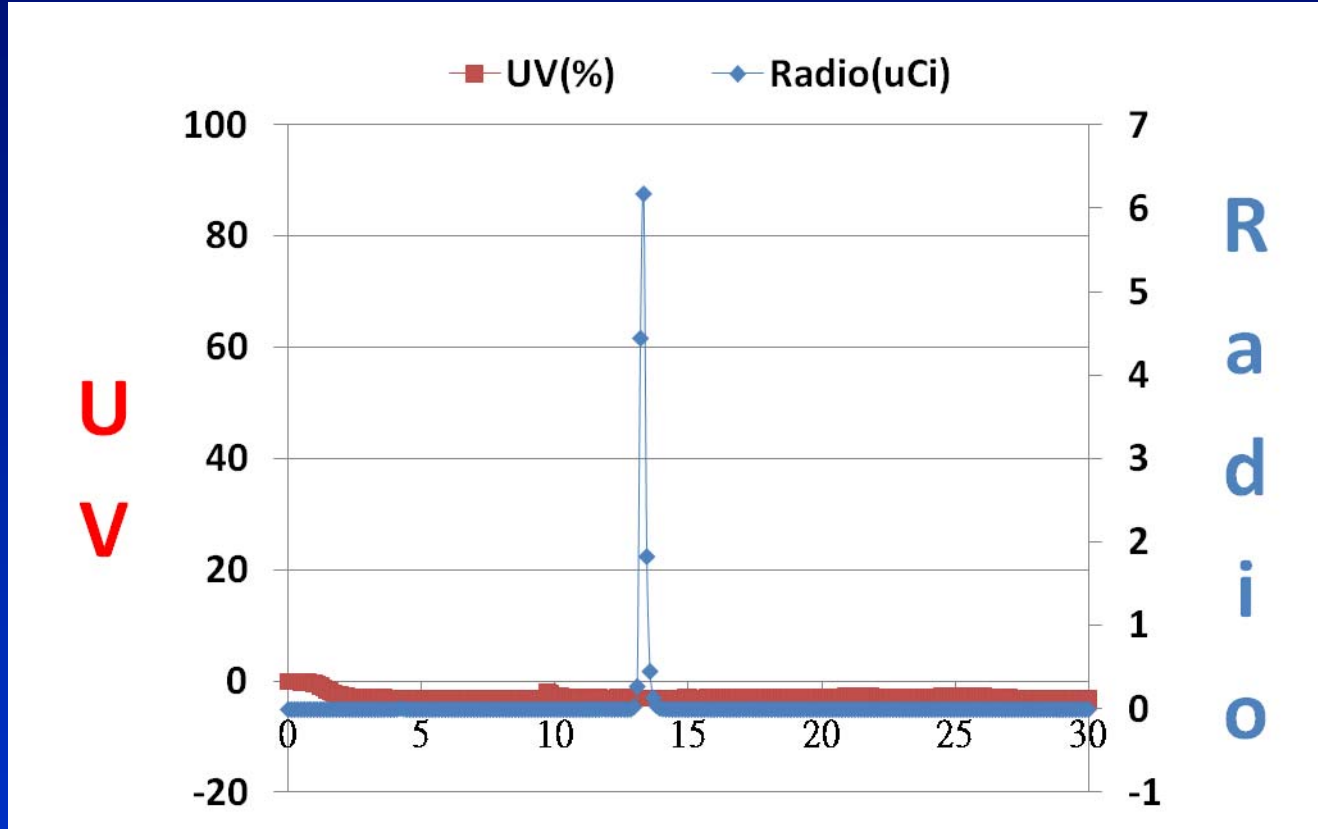


競爭抑制實驗 (^{18}F FLT)



HPLC (^{123}I -IaraU)

比放射性強度：
> 10^{12} Bq/mmol
放射化學純度:> 99%
放射化學產率:8.2%



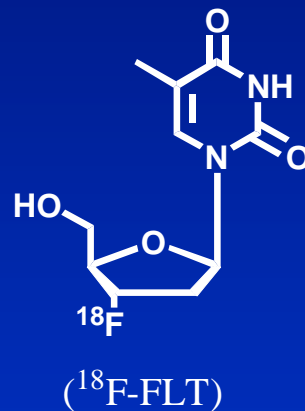
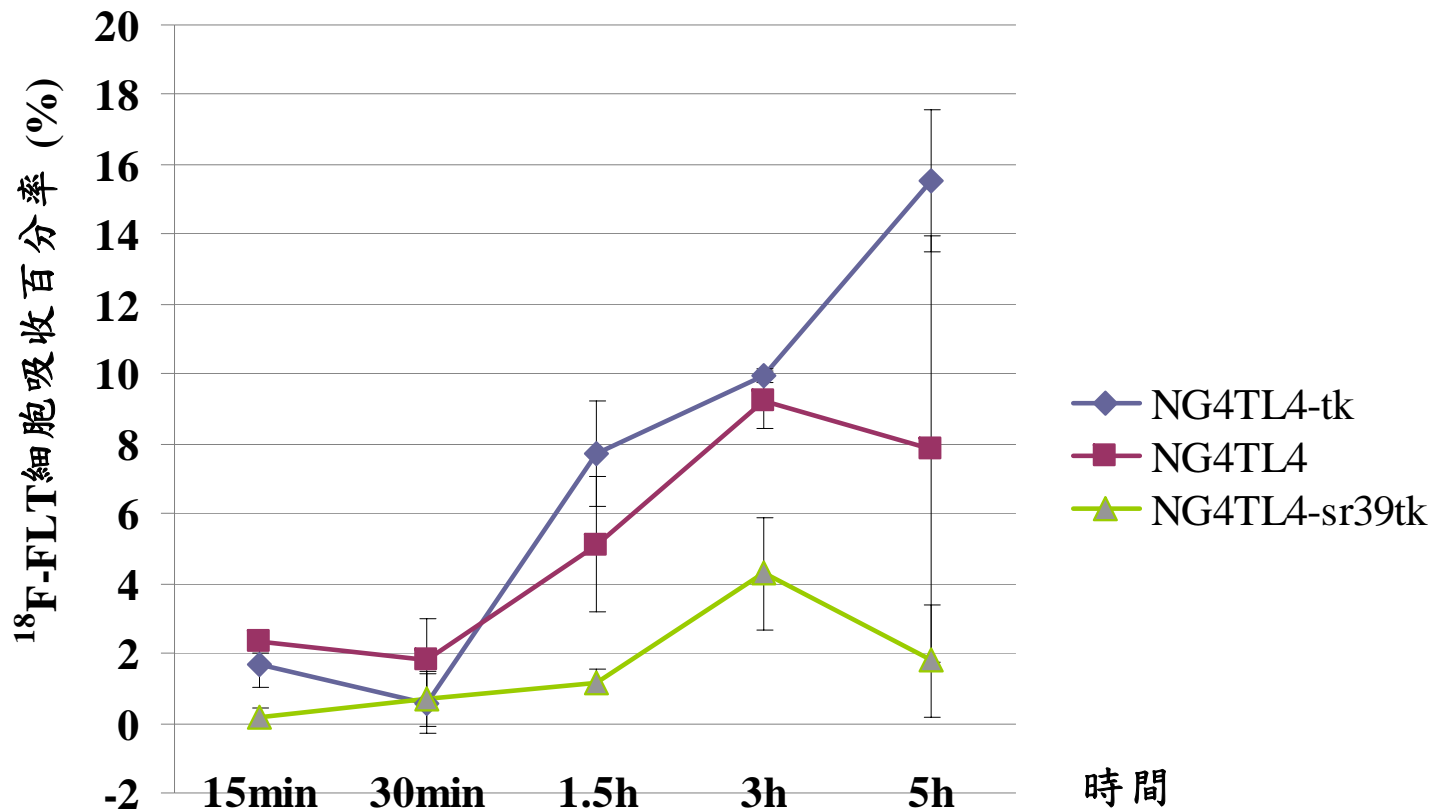
取 0.5 mL Crude product (0.2mCi) 過HPLC，管柱條件為ODS-7 C18半製備級管柱；
流洗條件為：

0~1分鐘：100% PBS (50mM pH5.7)

1~11分鐘：梯度增加乙醇比例，到11分鐘時乙醇比例達30%

11~25分鐘：維持70%PBS、30%乙醇

^{18}F -FLT細胞吸收實驗結果



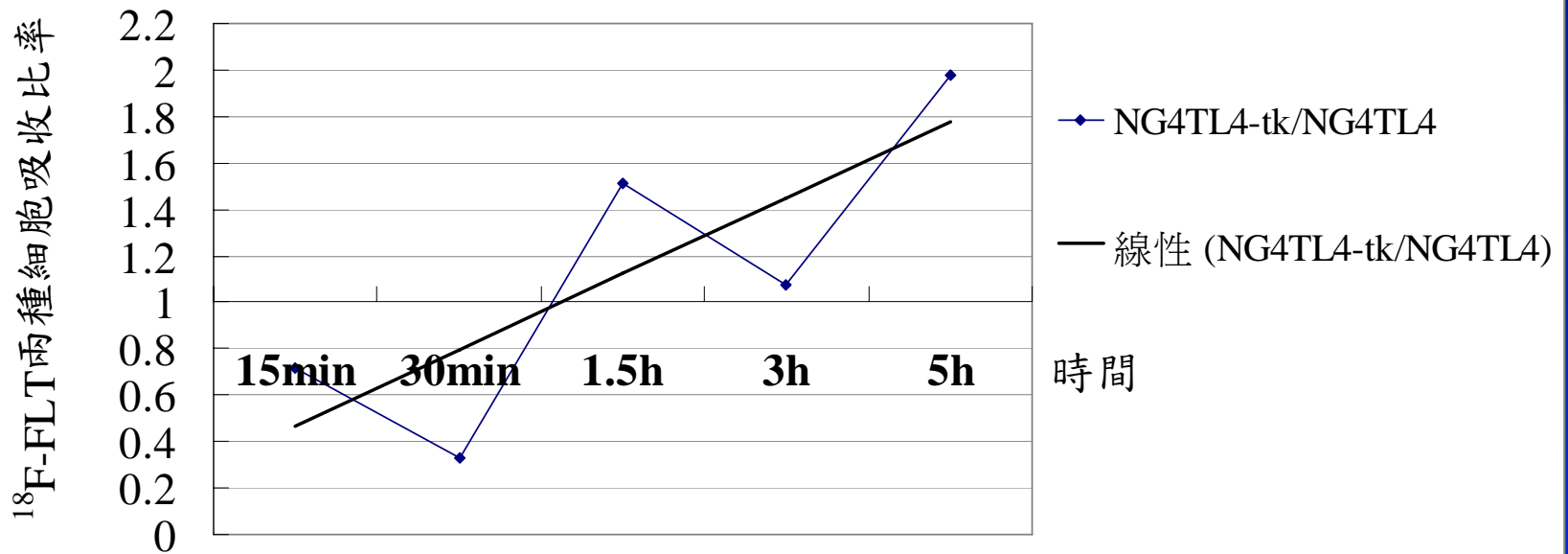
試管2放射強度(細胞放射強度)

細胞吸收百分率 (%) = ----- X 100 %

試管1(培養基放射強度) + 試管2放射強度

^{18}F -FLT細胞吸收實驗結果

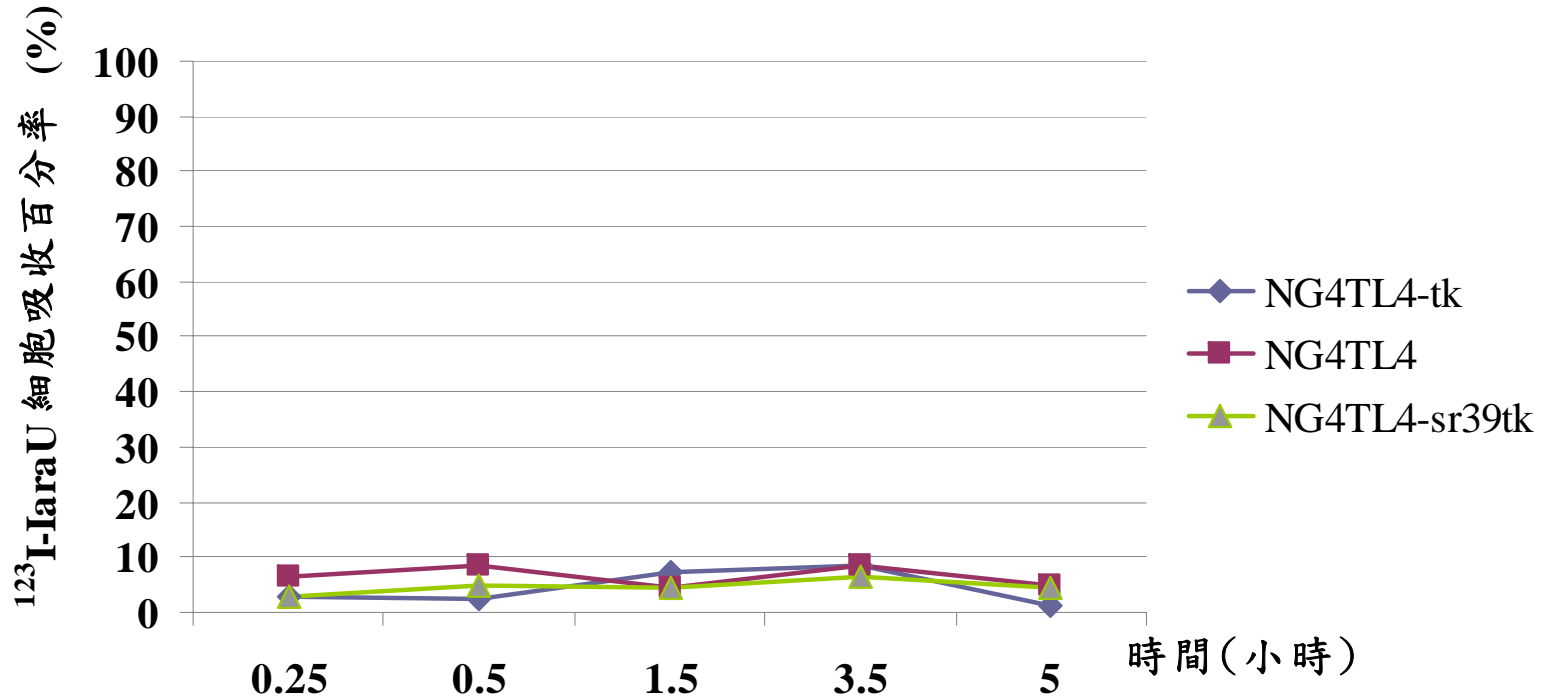
有無 HSV-tk的 ^{18}F -FLT細胞吸收比率



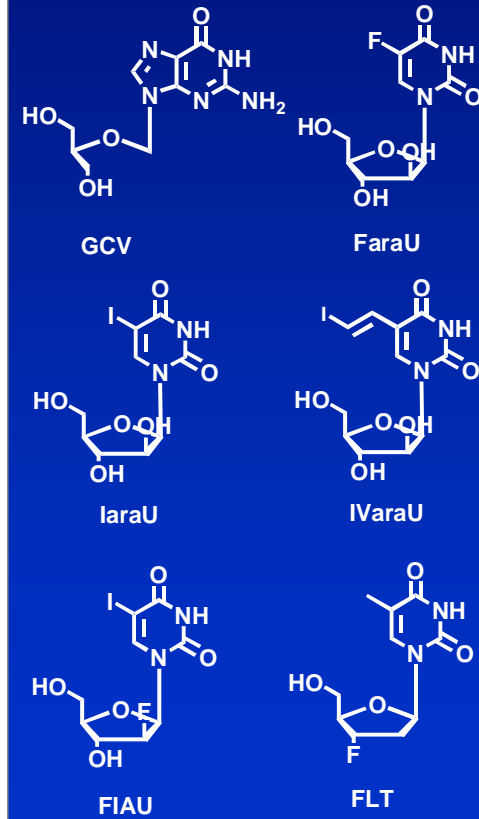
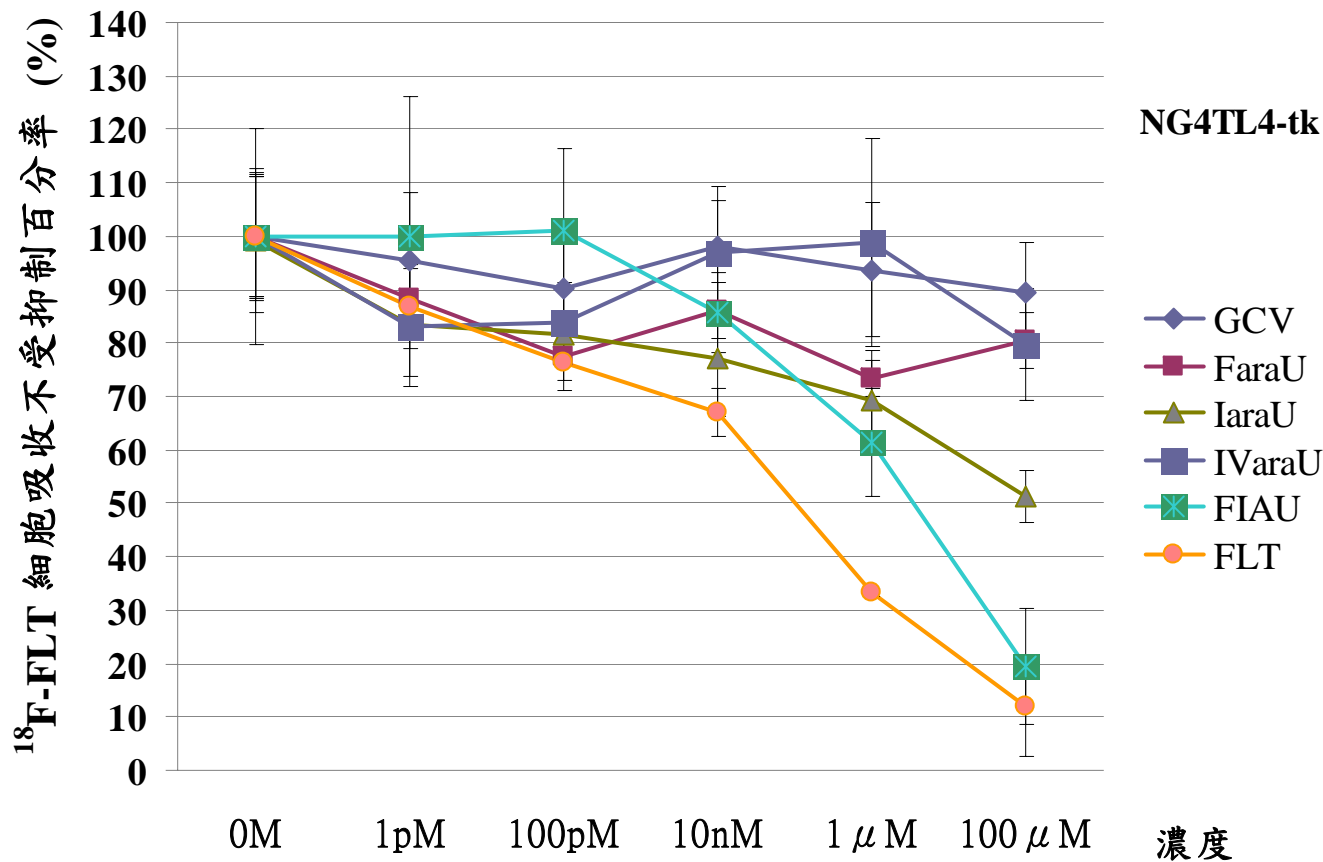
與文獻報導近似：

C6tk/C6 = 1.6 (2h) (*Nucl. Med. Commun.* 2006, 27, 25-30)

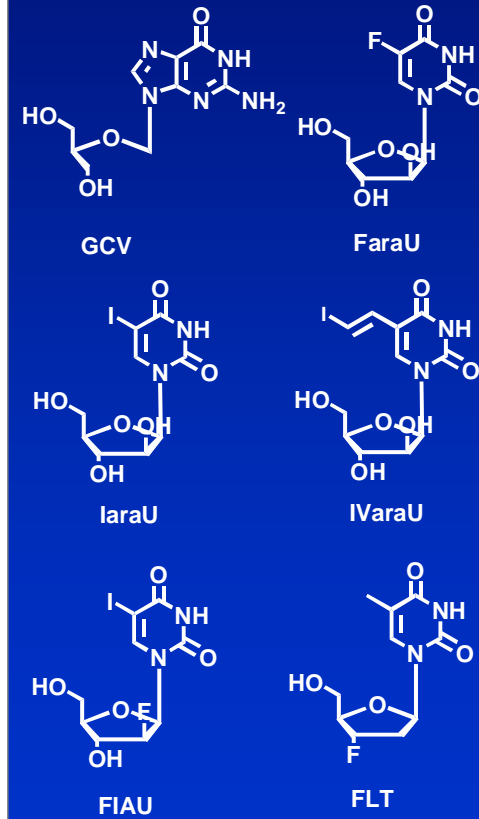
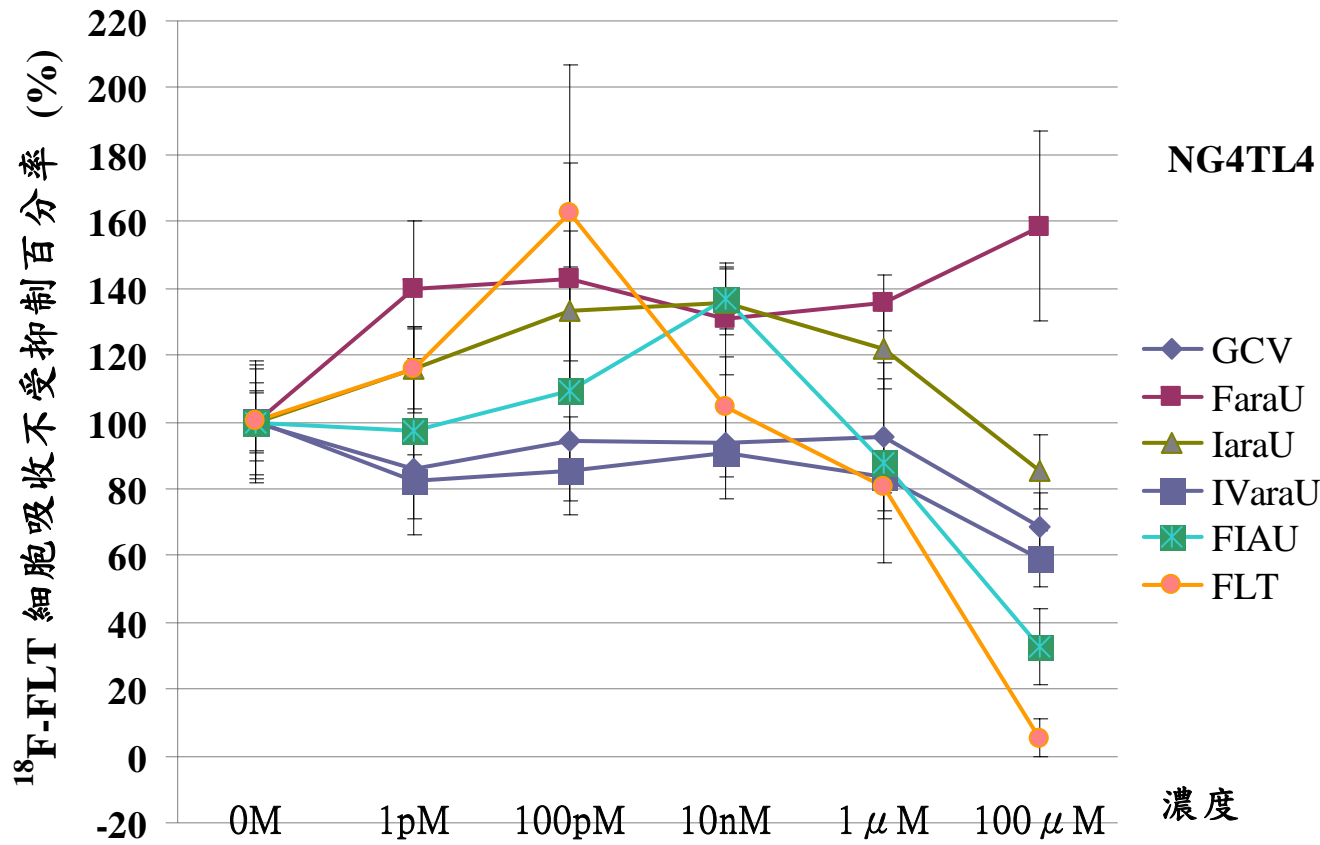
^{123}I -IaraU細胞吸收實驗結果



^{18}F -FLT細胞吸收之競爭抑制實驗結果

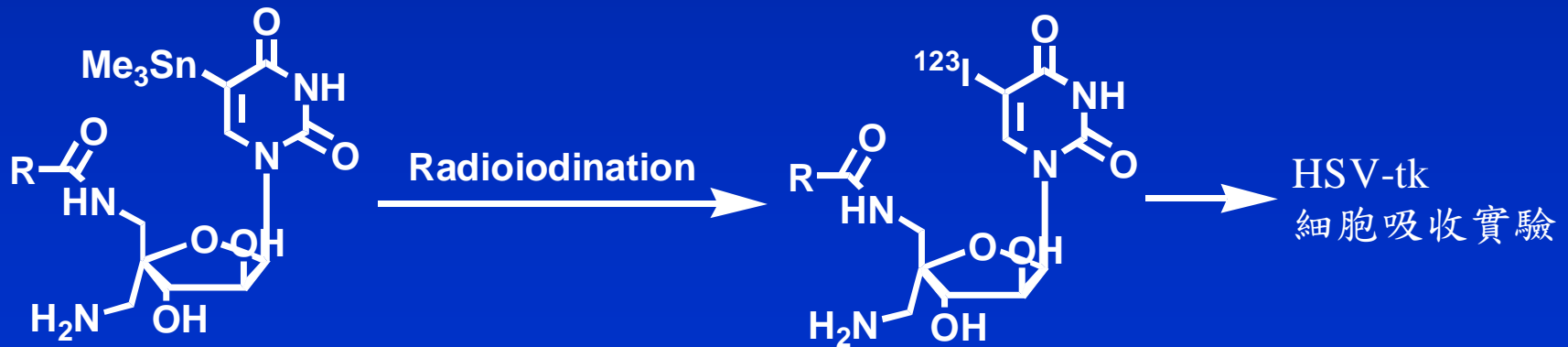


^{18}F -FLT細胞吸收之競爭抑制實驗結果



結論和未來展望

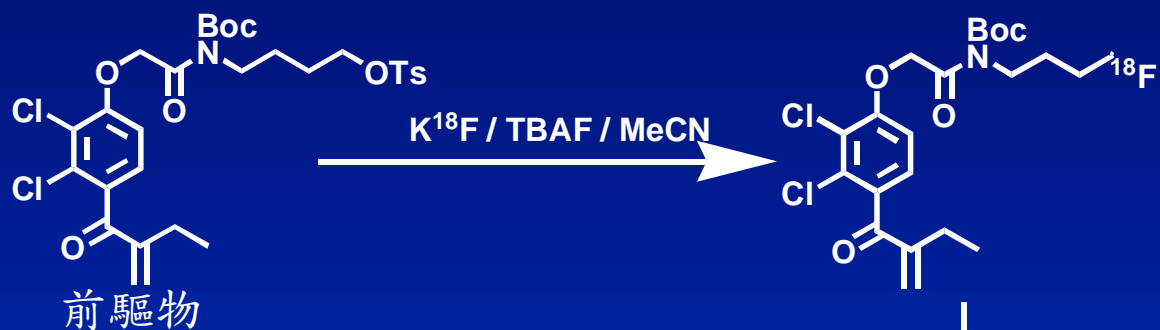
- 雖然 ^{123}I -IaraU細胞實驗結果不佳，但其尿苷類似物的放射性標誌方法已建立
- 未來將針對 ^{123}I -尿苷分子庫作進一步的研究：



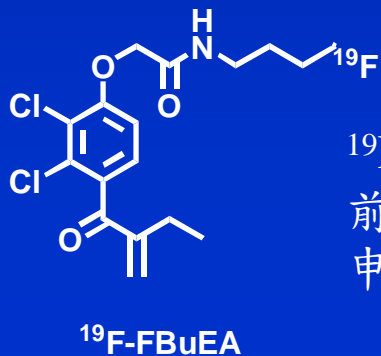
(Yu, C. S.; Wang, R. T.; Chiang, L. W. *Tetrahedron Lett.* **2007**, 48, 2979.)

其他正子造影探針的研發

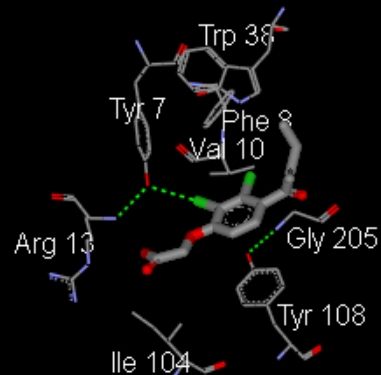
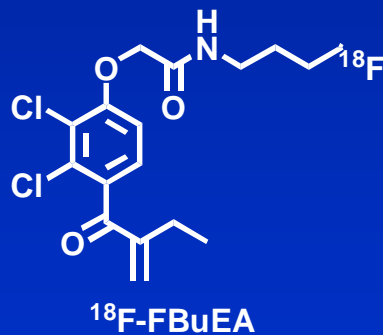
(^{18}F -FBuEA 針對 glutathione-S transferase 的探針)



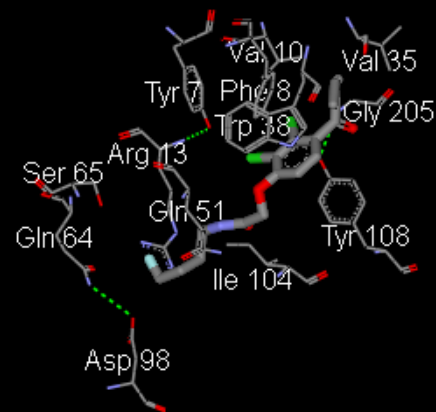
HPLC
checking with ^{19}F -FBuEA
and purification



^{19}F -FBuEA 的合成和
前驅物製備
申請專利中



Ethacrynic acid (PDB)



Fluoro-butyl ethacrynamide

Thank you for your attention

Acknowledgment

- 博士生

- 姜豐武
- 黃鶴聯

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- 林武智 博士