

台灣核醫學之父 葉鑫華教授追思紀念演講



葉鑫華教授的治學與研究

劉仁賢醫師

國立陽明大學生物醫學影像暨放射科學系

教授兼系主任

啟蒙

- **1956年國防醫學院生物物理系主任吳靜教授接掌內政部衛生司司長，籌設原子醫學實驗院。我看到原子能是醫學的未來。**
- **1963年留學美國史丹福大學，進入核子醫學系工作，受業於JP Kriss教授。**

史丹福大學（1963~1967）

- 研究、臨床與教學。助理研究員、講師、助理教授。
- 博士學位—**Prof. Kriss**：「**Peter**，在美國醫科畢業後再唸到博士，不會有更高的職位，也沒有更高的薪水。如果你想攻讀博士，懂的要唸，不懂的也要唸，浪費很多時間；你跟我在這裡做研究，懂的不要看，不懂的才要看。你就好好在這裡跟我教學、做臨床和研究。」
- 研究主題—**Prof. Kriss**：「我的老師叫我不要做跟他一樣的計畫，要自己找計畫方向。現在我也同樣告訴你，你要自己找。」
- 世界首位指出用配位子化學原理，由一步完成反應合成放射性鐳複合物的人。





Solid Resident Training



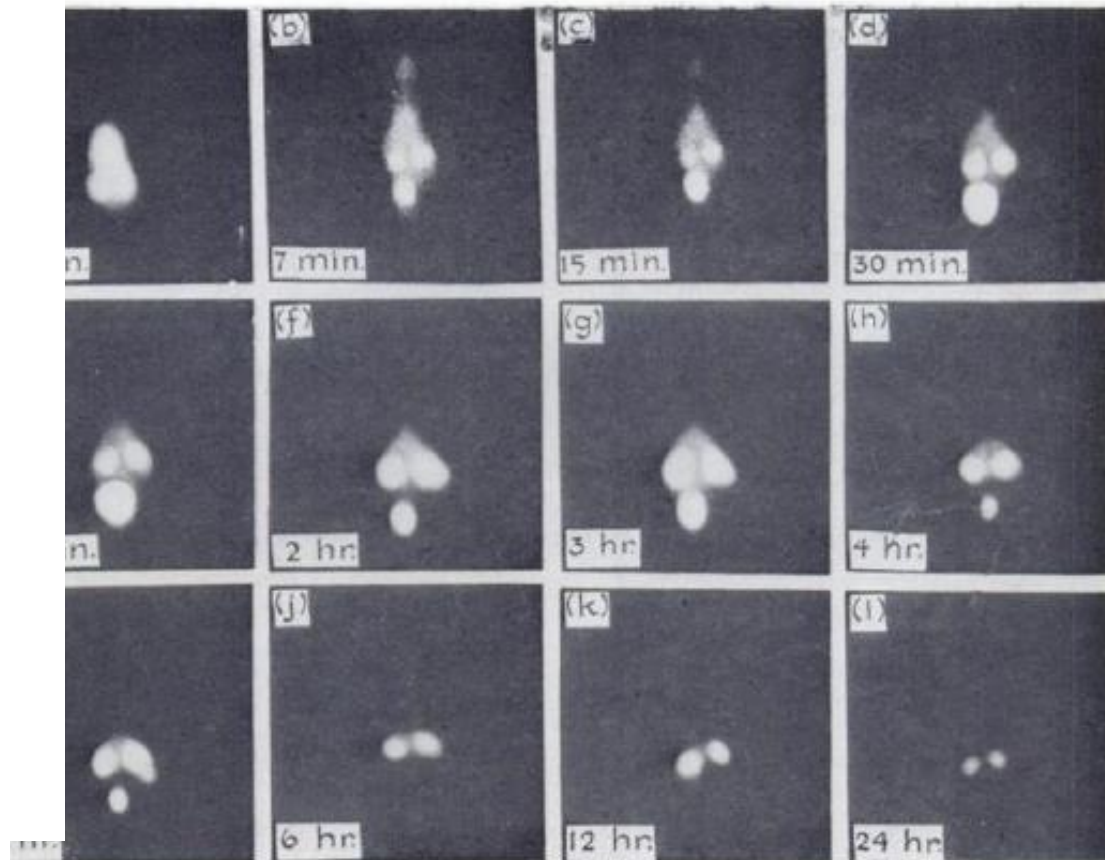
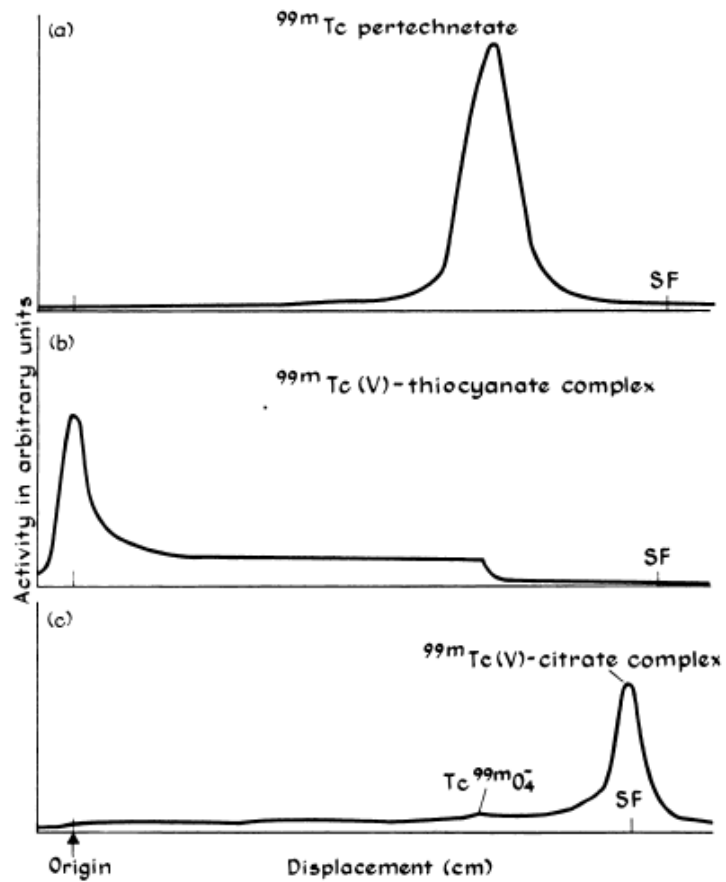
Distribution and Scintiphotography of a New Complex, Pentavalent Technetium-99m Citrate: Studies in the Rodent^{1,2,3,4}

Shin-Hwa Yeh, M.B. and Joseph P. Kriss, M.D.

Palo Alto, California

INTRODUCTION

Technetium-99m has been found physically optimal for scintillography (2,3), and is readily obtainable from a ^{99m}Tc generator as pertechnetate (TcO_4^-), the biological behavior of which bears some similarities to that of the iodide ion (4). The use of ^{99m}Tc pertechnetate has been found of value in scanning the brain (3), thyroid (5), and cardiac blood pool (6), in detection of extracranial neoplasms (7), and in scintiphotographic dynamic studies of the heart and great vessels (8,9). It seemed feasible to extend the clinical application of ^{99m}Tc by chelating agents, inasmuch as the biological distribution and excretion of metals can be altered considerably by chelation (10,11). Utilizing this approach, a new anionic ^{99m}Tc(V)-citrate complex has been synthesized in this laboratory. This report describes the distribution and scintiphotography studies following intravenous administration of the complex in mice and rats.



Technetium-99m(V)-Citrate Complex for Estimation of Glomerular Filtration Rate

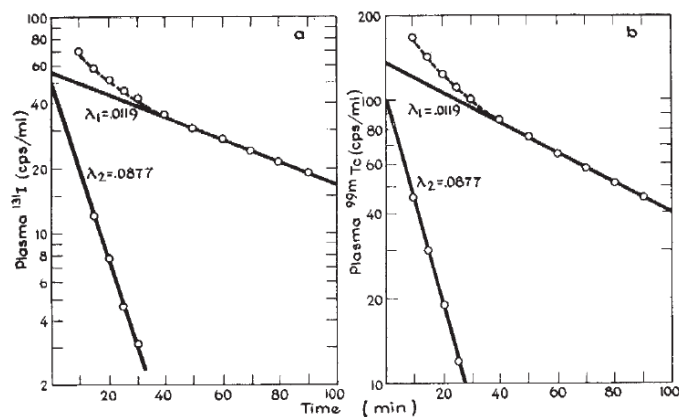
THE standard compound used for estimating the rate of glomerular filtration is inulin, but its chemical determination is tedious and time consuming. The technique for estimating the filtration rate with inulin requires constant infusion and serial urine collections. ^{14}C -carboxyl-,

^{131}I - and ^{125}I -allyl-inulin have been used because of their stability, cost and lack of radioactivity. Methods of analysis have limited the use of these compounds. Compounds labelled with a gamma emitting isotope can be estimated entirely by glomerular filtration. ^{131}I -diatrizoate^{4,5}, ^{131}I - (also ^{125}I -) inulin⁶, B_{12} (refs. 7-9), and ^{51}Cr -ethylenediamine¹⁰ have received attention. The

Our results suggest that technetium-99m(V)-citrate complex, like ^{131}I -diatrizoate, fulfils the requirements necessary for a compound used for estimating glomerular filtration rate and should be valuable in the investigation of renal function.

We thank Dr Eugene Dong for assistance in setting up the computer programme and Mr Cornelis Ploeg and Mr Stephen Freese for technical assistance. This work was supported by grants from the US Public Health Service and the Milheim Foundation for Cancer Research. We thank Nuclear Consultants, Inc., for the gift of technetium-99m.

S. L. KOUNTZ
S. H. YEH
J. WOOD
R. COHN
J. P. KRISS



Departments of Surgery,
Radiology and Medicine,
Stanford University School of Medicine,
Palo Alto, California.

返國服務

- 「雖有千里馬，也要有伯樂」，1967年恩師盧致德院長親臨史丹福大學要我回台灣，比照美國，着手擘劃建立現代核子醫學。
- 盧院長：「我們國防醫學院的學生出去，都是吃中國菜、講中國話、住在一塊，出國一兩年回來，沒有學到美國的文化。應該像你一樣，打進美國人的圈子。」
- 爭取核醫部門獨立。
- 引領核子醫學的先進應用。
- 成立國家多目標醫用迴旋加速器中心。

1967年盧師致德親臨史丹福促請返國發展核醫



美國核醫界領導者，參觀思源樓核醫部



1988年第四屆亞洲大洋洲核子醫學大會在台北圓山飯店召開



➤ **Strategy and History (19-Year Plan from 1968 to 1987)**

- 1. Personnel training and establishment of independent Nuclear Medicine Departments in individual hospitals and medical schools**
- 2. Boosting international reputation including hosting the 4th Asia and Oceania Congress of Nuclear Medicine in Taipei in 1988**
- 3. Foundation of Society of Nuclear Medicine, ROC, on March 1, 1987**
- 4. Official recognition of Nuclear Medicine as independent specialty in Taiwan in 1988**

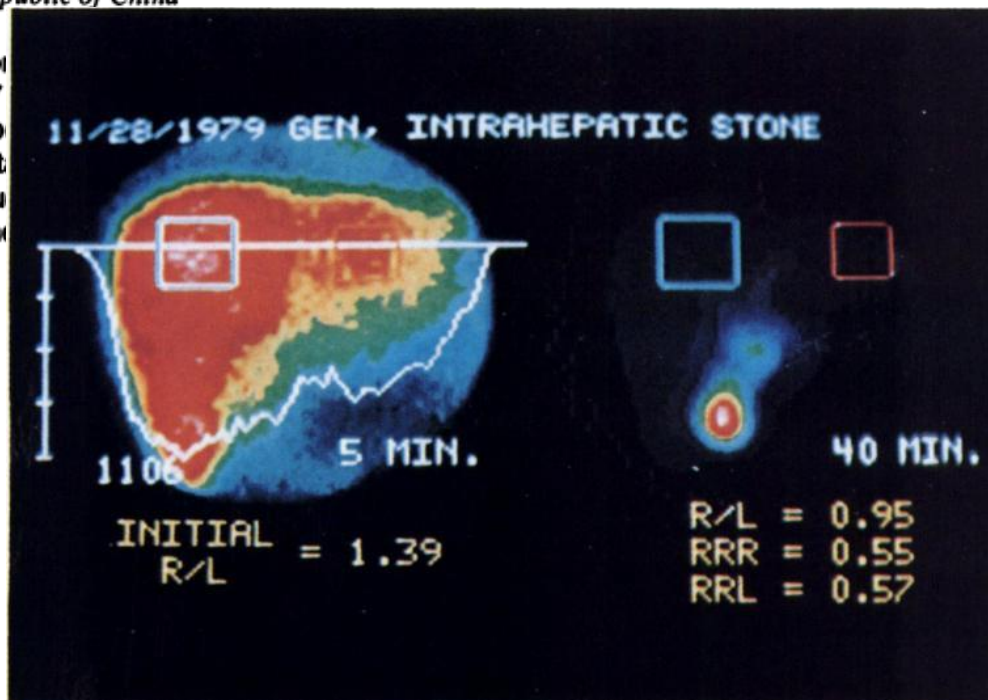
Technetium-99m HIDA Hepatic Lobar Distribution and Retention Ratios in Detection of Intrahepatic Lithiasis

Shin-Hwa Yeh, Ren-Shyan Liu, Por-Fen Chiu, Liang-Chih Wu, On-Kee Liu,
and Miao-Ju Huang

*Department of Nuclear Medicine, Veterans General Hospital, National Yang-Ming Medical
College, and National Defense Medical Center, Taipei, Taiwan, Republic of China*

Technetium-99m HIDA hepatic lobar distribution and retention ratios were used to evaluate patients with intrahepatic lithiasis. The data of 57 patients were analyzed. Results reveal a highly significant difference in these ratios between normal individuals. They are simple, objective, and easily obtainable. Determination of these ratios may replace [^{99m}Tc]HIDA sequential imaging, which is qualitative and time consuming, for screening intrahepatic lithiasis.

J Nucl Med 26:241-249, 1985



Sequential Uptake Patterns of Technetium-99m Pyrophosphate in Hepatoma

SHIN-HWA YEH, M.D.,* REN-SHYAN LIU, M.D.,* CHEN-HUI CHUANG, M.D.,* AND YANG-TE TSAI, M.D.†

Sequential liver scintiphotography with Tc-99m pyrophosphate (PYP) was used to prospectively evaluate its uptake patterns in hepatoma. The scintiphotos and time-activity curves of 40 cases were analyzed. Two distinct patterns of tumor activity were noted: gradual but complete extraction and trapping of Tc-99m PYP in

From the Departments of Nuclear Medicine
and Internal Medicine,†
Veterans General Hospital and
National Yang-Ming Medical College,
Taipei, Taiwan*

Xenon-133 Hepatic Retention Ratio: A Useful Index for Fatty Liver Quantification

Shin-Hwa Yeh, Liang-Chih Wu, Shyh-Jen Wang, Han-Chieh Lin, Ren-Shyan Liu, Shou-Dong Lee, and Jaw-Ching Wu

Departments of Nuclear Medicine and Medicine, Veterans General Hospital and National Yang-Ming Medical College, Taipei, Taiwan

Xenon-133 hepatic retention ratio was developed for quantifying fatty liver. Data were acquired in frame mode in the hepatic region and both lung bases for 5 min after rebreathing 20 mCi of gaseous ^{133}Xe and for another 5 min during washout. Static [$^{99\text{m}}\text{Tc}$]sulfur colloid liver imaging was performed with the patient in the identical position immediately after the ventilation study and data were stored for liver localization. A hepatic time-activity curve corrected for background activity was generated. The ^{133}Xe retention ratio was derived by dividing the activity at 3.5 min after washout by the peak activity. The data of 16 controls and 20 patients with fatty liver were analyzed. The retention ratio (mean \pm s.d.) was greatly increased in patients with fatty infiltration (0.43 ± 0.20 vs. 0.04 ± 0.08 in controls, $p < 0.001$). There was a strong positive correlation between the ^{133}Xe retention ratios and percentage of fat on biopsy as assessed by the amount of the liver tissue occupied by fat globules on H & E stained sections. The ^{133}Xe hepatic retention ratio is a simple, accurate and clinically useful index of detecting, quantifying and managing fatty infiltration of the liver.

J Nucl Med 30:1708–1712, 1989

Establishment of NPCC in Brief

- 1978**—Inception and promotion of idea establishing
- 1985** a PET/cyclotron center in Taiwan
- 1986**—Materialization and approval of the project
- 1988**
- 1989**—Implementation of the project including
- 1992** design in detail, building construction,
procurement and installation of equipments,
and training of nucleus of personnel abroad
in team or individually
- 1992**—Inauguration





國家多目標醫用迴旋加速器中心揭幕典禮俞院長國華蒞臨致辭



Initial Operation

- * **Short start-up phase**
- * **Smooth implementation of routine clinical applications**
- * **Simultaneous research development including pioneering study of hypoxic imaging ($[^{18}\text{F}]$ FMISO) and C-11 acetate in oncology**

Fluorine-18 fluoromisonidazole tumour to muscle retention ratio for the detection of hypoxia in nasopharyngeal carcinoma

Shin-Hwa Yeh¹, Ren-Shyan Liu¹, Liang-Chih Wu¹, David J. Yang², Sang-Hue Yen³, Chi-Wei Chang¹, Tong-Wei Yu¹, Kou-Liang Chou¹, Kuang Y. Chen³

¹ National PET/Cyclotron Center and Department of Nuclear Medicine, Taipei Veterans General Hospital and National Yang-Ming University School of Medicine, Taipei, Taiwan

² Division of Diagnostic Imaging, University of Texas M.D. Anderson Cancer Center, Houston, Texas, USA

³ Cancer Center, Taipei Veterans General Hospital and National Yang-Ming University School of Medicine, Taipei, Taiwan

Received 9 December 1995 and in revised form 4 April 1996

Abstract. In vivo demonstration of hypoxia is of significance for tumour patient management. Fluorine-18 fluoromisonidazole (¹⁸F]FMISO) is a proven hypoxic imaging agent. We developed an [¹⁸F]FMISO tumour to muscle retention ratio (TMRR) for the detection of tumour hypoxia in nasopharyngeal carcinoma (NPC). Data were acquired by positron emission tomography (PET) of the nasopharynx and neck after intravenous injection of 370 MBq of [¹⁸F]FMISO. Two imaging protocols were adopted: a long protocol for comprehensive dy-

cantly lower than that for non-keratinized carcinoma ($P<0.05$). The [¹⁸F]FMISO TMRR is a simple and clinically useful index for detecting tumour hypoxia in NPC.

Key words: Fluorine-18 fluoromisonidazole – Tumour to muscle retention ratio – Hypoxia – Nasopharyngeal carcinoma

Eur J Nucl Med (1996) 23:1378–1383

^{11}C -acetate clearance in nasopharyngeal carcinoma

S.H. YEH,^{1*} R.S. LIU,¹ L.C. WU,¹ S.H. YEN,² C.W. CHANG¹ and K.Y. CHEN²

¹National PET/Cyclotron Center and Department of Nuclear Medicine and ²Cancer Therapy Center, Taipei Veterans General Hospital and National Yang-Ming University School of Medicine, Taipei, Taiwan, Republic of China

Received 15 January 1998, in revised form 11 August 1998 and accepted 21 September 1998

PET imaging of brain astrocytoma with 1-¹¹C-acetate

Ren-Shyan Liu^{1, 4}, Cheng-Pei Chang¹, Lee-Shing Chu¹, Yum-Kung Chu¹, Hung-Jen Hsieh¹, Chi-Wei Chang^{1, 4}, Bang-Hung Yang^{1, 4}, Shan-Hui Yen², Min-Chao Huang³, Su-Quin Liao¹, Shin-Hwa Yeh⁴

¹ National PET/Cyclotron Center, Department of Nuclear Medicine, Taipei Veterans General Hospital, Taipei, Taiwan

² Cancer Center, Taipei Veterans General Hospital, Taipei, Taiwan

³ Institute of Neurology, Taipei Veterans General Hospital, Taipei, Taiwan

⁴ National Yang-Ming University Medical School, Taipei, Taiwan

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Abstract. *Purpose:* The purpose of this study was to assess the use of 1-¹¹C-acetate (ACE) as a metabolic tracer for the detection and characterisation of astrocytomas.

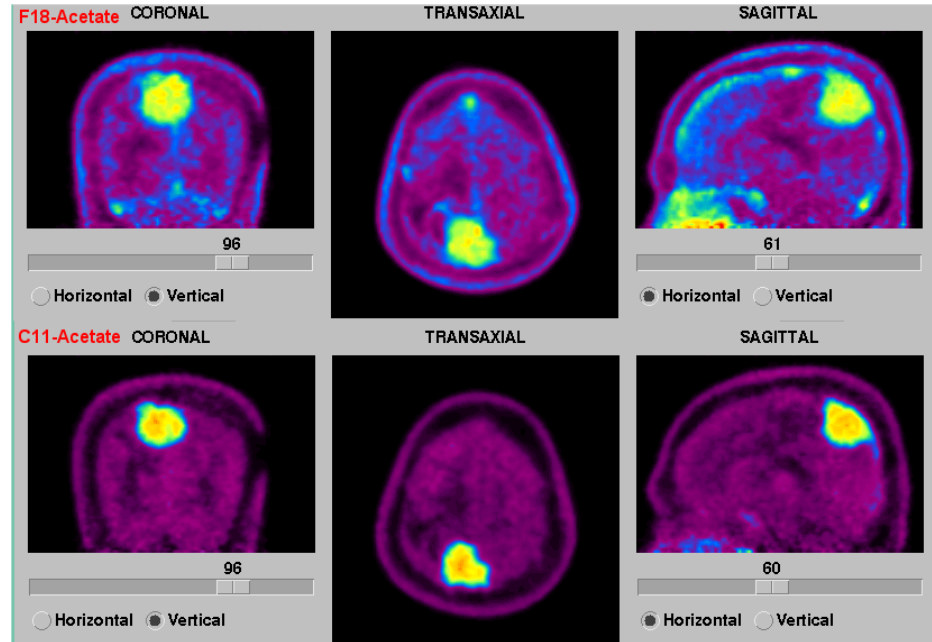
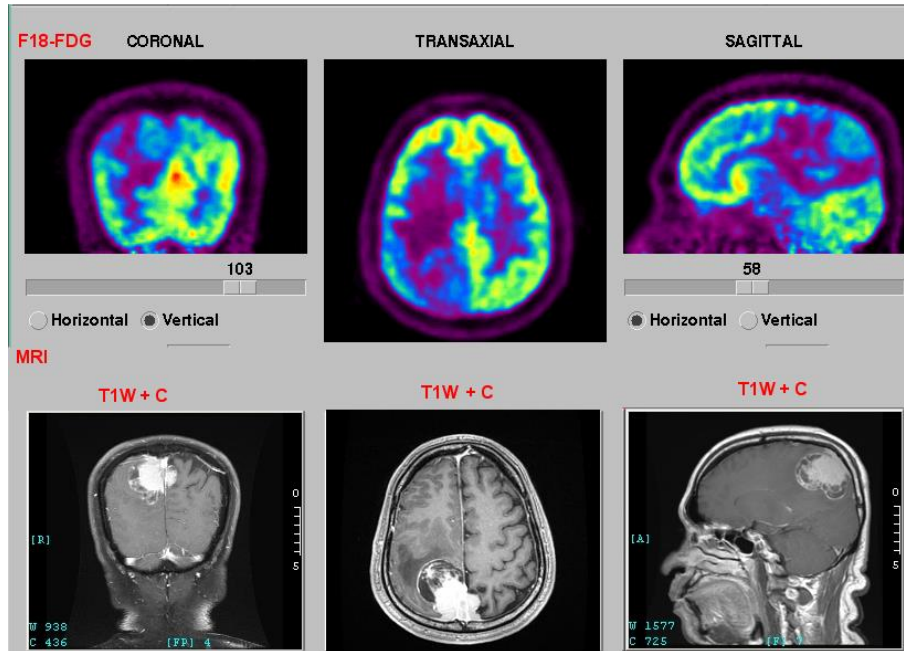
Methods: Positron emission tomography (PET) studies with ACE and 2-¹⁸F-fluoro-2-deoxy-*D*-glucose (FDG) were performed sequentially in 26 patients with primary

Keywords: 1-¹¹C-acetate – 2-¹⁸F-fluoro-2-deoxy-*D*-glucose – Astrocytoma – Glioma – Positron emission tomography

Eur J Nucl Med Mol Imaging (2006) 33:420–427

DOI 10.1007/s00259-005-0023-0

Detection of Meningioma with Low Glucose Metabolism by ^{11}C -acetate and ^{18}F -Fluoroacetate PET



--- On Sun, 26/6/11, Wagner, Henry <hwagner@jhsp.h.edu> wrote:

From: Wagner, Henry <hwagner@jhsp.h.edu>
Subject: RE: great to hear from you
To: "Peter Yeh" <pshyeh2002@yahoo.com.au>
Received: Sunday, 26 June, 2011, 10:25 PM

Thanks, Peter, for your thoughtful comments. I'm afraid you are right. But keep in mind: What we call "structures" in biology, are slow chemical processes of long duration. What we call "function" are fast processes of short duration. All is function, that is, time changes..

Please keep in touch.

All the best.

Henry

From: Peter Yeh [pshyeh2002@yahoo.com.au]
Sent: Sunday, June 26, 2011 4:40 AM
To: Wagner, Henry
Subject: Re: great to hear from you

26 June 2011

Dear Dr. Wagner,

Thank you very much for your kind E-mail. I am glad that your retirement life is still busy, colorful and fruitful. I am still back and forth between Sydney and Taipei twice a year, staying in Taipei about two months each time.

I have not heard from Dr. Delbeke yet. Actually, I only pointed out the focus of the problems in the United States. Under the current tendency, nuclear physicians will be forced to be radiologists as well to find a job. Hybrid imaging training for the nuclear physicians will be all right in the countries where nuclear medicine is independent, but it won't meet the need of radiology in USA, especially in the community hospitals. In stead, nuclear radiologists from the hybrid imaging training for radiologists may replace the nuclear physicians eventually. This will result in deteriorating the quality of nuclear medicine practice as a whole and interfering with the further development of nuclear medicine. Basically speaking, radiologists are anatomists. It is tragic that nuclear physicians may vanish with time in USA because of the convergency of anatomical and functional modalities in favour of radiologists under the current infrastructure. I hope my prediction will turn out to be wrong.

With my best regards to both of you,

Peter Yeh

仁厚
文盛年有方
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七
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二

*NEW HORIZON IN THE
POSTGENOMIC
ERA---MOLECULAR IMAGING*



Peter Shin-Hwa Yeh, M.D.

*Emeritus Professor of Nuclear Medicine,
National Yang-Ming University School of Medicine;
President Emeritus, Society of Nuclear Medicine, ROC;
Advisor, Department of Nuclear Medicine,
Taipei Veterans General Hospital, Taipei, Taiwan*

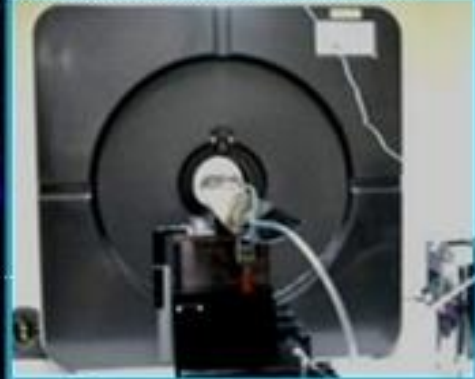
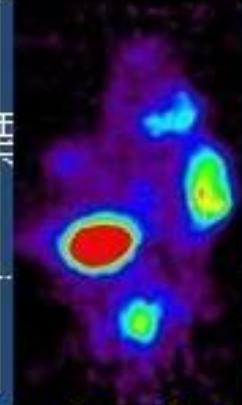
20 November 2004

** Nuclear medicine — particularly PET — appears uniquely suited to take the lead in this new field of imaging, namely, molecular imaging. Since most nuclear medicine tracers are small molecules, they have favorable kinetics, and the tracer concentrations required are factors of $10^{-4} \sim 10^{-9}$ below those used in MR imaging or CT.*





Optical Imaging



MicroPET

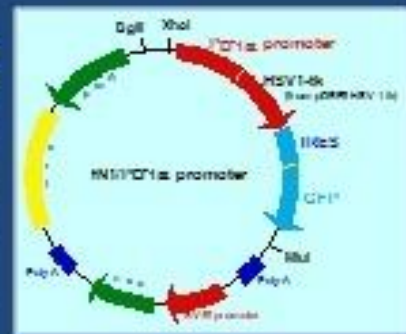
Molecular and Genetic Imaging Core multimodality biomolecular imaging



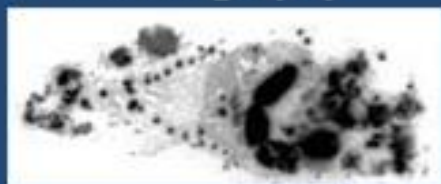
Cyclotron



cGMP radiochemical lab



Autoradiography



MicroSPECT/PET/CT



PET/CT



NYMU-Taipei VGH Campus



NEWS OF THE WEEK

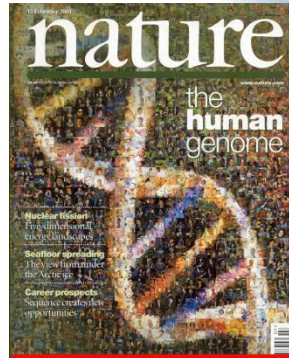
Chimp Sequencing Crawls Forward

TOKYO—An international team of researchers is pulling together an effort to sequence the chimpanzee genome. So far, however, the big global genomic players aren't joining the party. Genes from Japan, Germany, China, Korea, and Taiwan used a meeting here last week to promote the project, while disappointed U.S. scientists were absent. But their government would provide a significant portion of the estimated \$100 million needed to complete it.

THE CHIMP PLAYERS

Country	Lead Laboratory
Japan	RIKEN's Genomic Science Center, Yokohama
Germany	Max Planck Institute for Molecular Genetics, Berlin
Korea	Seoul National University, Seoul
China	National Human Genome Center, Beijing
Taiwan	National Yang Ming University, Taipei

Yoshiaki Sakaki, director of the Human Genome Research Group at RIKEN's Genomic Science Center in Yokohama, said that sequencing the chimp genome should help to answer basic questions about evolution. One is a common human condition: "all those that makes humans human," he says. Ajit Varki, a biochemist at the University of California, San Diego, believes that the knowledge could also prove invaluable in treating a number of human diseases, including AIDS and Alzheimer's, that are very difficult to treat in animals. Varki, who is studying the evolution...



the human genome

Nuclear History
The Clinton administration's decision to scrap the Kyoto Protocol has set off a firestorm in the U.S. and abroad.

Neurological Awakening
The New York Times reports on the discovery of a gene that causes a form of dementia.

Cancer prospects
Scientists are optimistic about the possibility of curing cancer with a new drug.



葉教授對台灣核子醫學的貢獻

- 成立獨立的核醫學學科
- 率先開專科醫師制度先河
- 進軍國際核醫領域
- 成立核子醫學學會



1987年三月八日中華民國核醫學學會假榮總舉行成立大會

葉語錄

- 人有三類：
先知先覺、後知後覺、不知不覺
- 人有三種：
第一種人非常聰明、有基礎，只要一句話，他就懂了；
第二種人是完全不懂，但是可以教他；
第三種人是半桶水，他懂一點，又不是全懂，卻有自己的主見，這種人最難教。

人才三級論

第一級為醫學院畢業，擔任住院醫師，乃至五、六年之專科醫師，為學有所專人才。

第二級人才，是做過五、六年之主治醫師，做好教學、研究工作，建立自己學術聲譽，研究有成，「學有專於外」之人才。這種人才要有耐性、天賦、鏗而不捨的精神，經名師指導，五、六年後，得因研究成績而在國際醫學上嶄露頭角。

第三級人才更是鳳毛麟角，為國際級人才。既學有所專，研究有成，更為國際上有名望人才，諸如在國際會議上，任主席、會長或特別演講者。這種國際學術領導人才，會寫、會講，能縱橫捭闔於國際醫學舞台上。能否達到第三級，除天賦歷練外之外，那可又得看造化了。

永遠的核醫導師

核醫做不好是「照相館」，做得好是「教師中的教師」
(teacher's teacher) 。

