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Education

1975 Ph.D. Physics, University of Tennessee, U.S.A.

1972 M.S. Physics, University of Louisville, U.S.A.

1969 B.S. Physics, Chung Yuan College of Science and Engineering, Taiwan

Professional Experiences

國立清華大學特聘教授 (2006 ~ 2008)

國立清華大學生醫工程與環境科學(原子科學)系/所教授 (1981 ~ 2008)

國立清華大學原子科學研究所所長 (1989 ~ 1992)

國立清華大學保健物理組組長 (1981 ~ 1984)

國立清華大學原子科學研究所副教授 (1977 ~ 1981)

美國德州農工大學核子工程系/所客座教授 (1992 ~ 1993)

美國布魯克海汶國家實驗室客座研究員 (1987)

英國丹地大學生物物理研究所客座教授 (1984)

丹麥歐丹斯大學物理系/所客座教授 (1982)

美國橡樹嶺國家實驗室衛生安全研究所研究員 (1975 ~ 1977)

Research Interest

質子與重離子治療的細胞效應與 DNA 傷害研究

比較光子、質子、重離子治療在細胞中的微米劑量分布，以及這些粒子在 DNA 中的奈米劑量分布，然後利用微劑量學與奈米劑量學的方法，評估質子與重離子治療之細胞效應與 DNA 傷害的相對生物效應(relative biological effectiveness)。目前研究成果包括：

- (1) 研製 1 毫米直徑之圓柱形迷你組織等效比例計數計，模擬量測小於 1 微米直徑之細胞靶體積的微劑量。
- (2) 運用蒙地卡羅 FLUKA、PENELOPE、MCDS 程式，模擬計算細胞核與 DNA 內的奈微劑量分布。
- (3) 研究多種細胞效應與 DNA 雙股斷裂的相對生物效應。

核醫標靶治療的奈微劑量研究

針對放射性核種的核醫標靶治療，利用產率高、射程短的歐傑電子發射體，以及核反應器之熱中子與含硼藥物作用產生的阿伐粒子，進行多種細胞效應與 DNA 雙股斷裂的研究。目前研究成果包括：

- (1) 自製兩支組織等效比例計數器，量測含硼之腫瘤細胞與不含硼之正常細胞的奈微劑量，然後評估硼中子捕獲治療腦瘤的療效。
- (2) 利用蒙地卡羅程式，模擬計算歐傑電子發射體在 DNA 標靶治療的相對生物效應。

放射診療病患劑量與輻射防護的研究

鑑於放射診療病患人數的增加趨勢，以及先進設備的引進快速，導致我國醫療曝露的人口劑量大幅成長。從放射診療之最優化與輻射防護之品質保證的角度，有必要進行提升影像品質與降低病患劑量的研究。目前研究成果包括：

- (1) 利用健保資料庫與假體度量結果，評估我國放射診療之病患劑量與人口劑量。
- (2) 利用大規模之臨床調查數據，分析我國放射診療室的曝露條件與劑量指標，然後評估放射診療室所需的結構屏蔽。
- (3) 利用假體數位影像的分析，評估放射診斷的最優化條件。

Recent Publications

1. C. Y. Pan, Y. W. Huang, K. H. Cheng, T. C. Chao and C. J. Tung, Microdosimetry spectra and relative biological effectiveness of 15 and 30 MeV proton beams, Applied Radiation and Isotopes 97, 101-105, 2015 (SCI).
2. C. Y. Yeh, C. J. Tung, C. C. Lee, M. H. Lin and T. C. Chao, Measurement-based Monte Carlo simulation of high definition dose evaluation for nasopharyngeal cancer patients treated by using intensity modulated radiation therapy, Radiation Measurements 71, 333-337, 2014 (SCI).
3. Y. Y. Hsiao, T. H. Hung, S. J. Tu and C. J. Tung, Fast Monte Carlo Simulation of DNA Damage Induction by Auger-electron Emission, International Journal of Radiation Biology 90, 392-400,

2014 (SCI).

4. C. Y. Yeh, C. J. Tung, T. C. Chao, M. H. Lin and C. C. Lee, A Dual Resolution Measurement Based Monte Carlo Simulation Technique for Detailed Dose Analysis of Small Volume Organs in the Skull Base Region, *Radiation Physics and Chemistry* 104, 389-392, 2014 (SCI).
5. C. C. Lee, J. F. Wu, K. P. Chang, C. H. Chu, S. P. Wey, H. L. Liu, C. J. Tung, S. W. Wu and T. C. Chao, The Use of Normoxic Polymer Gel for Measuring Dose Distributions of 1, 4 and 30 mm Cones, *Radiation Physics and Chemistry* 104, 221-224, 2014 (SCI).
6. C. Y. Yeh, C. C. Lee, T. C. Chao, M. H. Lin, P. A. Lai, F. H. Liu and C. J. Tung, Application of Measurement-based Monte Carlo Method in Nasopharyngeal Cancer Patients for Intensity Modulated Radiation Therapy, *Radiation Physics and Chemistry* 95, 240-242, 2014 (SCI).
7. C. C. Lee, Y. J. Lee, C. J. Tung, H. W. Cheng and T. C. Chao, MCNPX Simulation of Proton Dose Distribution in Homogeneous and CT Phantoms, *Radiation Physics and Chemistry* 95, 302-304, 2014 (SCI).
8. T. R. Chen, Y. S. Tyan, C. H. Chu, M. C. Wu and C. J. Tung, Surveyed Data for Structural Shielding Calculations of Radiographic X-ray Installations in Taiwan, *Health Physics* 104, S60-S67, 2013 (SCI).
9. J. Li, C. Li, R. Qiu, C. Yan, W. Xie, Z. Zeng and C. J. Tung, Comparison of Direct DNA Damages Induced by Low Energy Electrons with Different Inelastic Cross Sections, *Nuclear Instruments and Methods B* 311, 27-36, 2013 (SCI).
10. T. C. Chao, C. C. Wang, J. L. Li, C. Y. Li and C. J. Tung, Cellular- and Micro-dosimetry of Heterogeneously Distributed Tritium, *International Journal of Radiation Biology* 88, 151-157, 2012 (SCI).
11. C. C. Wang, Y. Hsiao, C. C. Lee, T. C. Chao, C. C. Wang and C. J. Tung, Monte Carlo Simulations of Therapeutic Proton Beams for Relative Biological Effectiveness of Double Strand Break, *International Journal of Radiation Biology* 88, 158-163, 2012 (SCI).
12. F. Y. Hsu, W. F. Lee, C. J. Tung, J. S. Lee, T. H. Wu, S. M. Hsu, H. T. Su and T. R. Chen, Ambient and Personal Dose Assessment of a Container Inspection Site Using a Mobile X-ray System, *Applied Radiation and Isotopes* 70, 456-461, 2012 (SCI).
13. T. R. Chen, Y. S. Tyan, P. S. Teng, J. H. Chou, C. Y. Yeh, T. W. E, C. H. Shau and C. J. Tung, Population Dose from Medical Exposure in Taiwan, *Medical Physics* 38, 3139-3148, 2011 (SCI).
14. T. C. Chao, Y. S. Huang, F. Y. Hsu, Y. Hsiao, C. C. Lee and C. J. Tung, Cellular Dosimetry and Microdosimetry for Internal Electron Emitters, *Radiation Protection Dosimetry* 143, 248-252, 2011 (SCI).
15. C. J. Tung, S. F. Tsai, H. Y. Tsai, I. J. Chen, Determination of the Voxel Phantom for the Reference Taiwanese Adult from CT Image Analyses, *Radiation Protection Dosimetry* 146, 186-190, 2011 (SCI).
16. C. J. Tung, C. H. Yang, C. Y. Yeh and T. R. Chen, Population Dose from Medical Diagnostic Exposure in Taiwan, *Radiation Protection Dosimetry* 146, 248-251, 2011 (SCI).

17. C. S. Liu, K. H. Lin, R. C. Lee, H. S. Tseng, L. W. Wang, P. I. Huang, L. S. Chao, C. Y. Chang, S. H. Yen, C. J. Tung, S. J. Wang, C. Y. Wong and R. S. Liu, Model-based Radiation Dose Correction for Yttrium-90 Microsphere Treatment of Liver Tumors with Central Necrosis, *International Journal of Radiation Oncology Biology Physics*, 81, 660-668, 2011 (SCI).
18. M. T. Lin, C. J. Tung and H.Y. Tsai, Scatter and Energy Dependence of Thermoluminescent Dosimeter to Determine Half-value Layer in Digital Mammography: Monte Carlo Results, *Radiation Measurements* 46, 2090-2093, 2011 (SCI).
19. T. C. Chao, P. C. Yu, C. C. Lee, C. J. Wu and C. J. Tung, In Vivo Dosimetry with Asymmetry and Heterogeneity Correction, *Radiation Measurements* 46, 1956-1959, 2011 (SCI).
20. T. C. Chao, Y. F. Kao, C. C. Lee and C. J. Tung, Dose Assessment for Chest X-ray Examination Based on a Voxelised Human Model, *Radiation Measurements* 46, 2077-2080, 2011 (SCI).
21. C. C. Lee, A. M. Chen, C. J. Tung, T. C. Chao, Monte Carlo Simulation of Small Field Electron Beams for Small Animal Irradiation, *Radiation Measurements* 46, 2003-2005, 2011 (SCI).
22. S. W. Wu, T. C. Chao, C. J. Tung, M. H. Lin and C. C. Lee, MLC Mediated Beam Hardening Effects in IMRT, *Radiation Measurements* 46, 1989-1992, 2011 (SCI).
23. P. C. Yu, T. C. Chao, C. J. Tung, C. J. Wu and C. C. Lee, Dose Assessment for Brachytherapy with Henschke Applicator, *Radiation Measurements* 46, 2028-2030, 2011 (SCI).
24. W. H. Chu, J. H. Lan, T. C. Chao, C. C. Lee and C. J. Tung, Neutron Spectrometry and Dosimetry around 15 MV Linac, *Radiation Measurements* 46, 1741-1744, 2011 (SCI).
25. T. R. Chen, Y. S. Tyan, J. J. Yang, C. H. Shao, J. Y. Lin and C. J. Tung, Measurements and Applications of Dose Indices in Radiography, *Radiation Measurements* 46, 2044-2047, 2011 (SCI)
26. C. J. Tung, M. T. Lin, F. Y. Hsu, J. H. Lee, C. H. Chu and H. Y. Tsai, Half-value Layer Determination using Thermoluminescent Dosimeters for Digital Mammography, *Radiation Measurements*, 45, 729-732, 2010 (SCI).
27. C. J. Tung, P. C. Yu, M. C. Chiu, C. Y. Yeh, C. C. Lee and T. C. Chao, Midline Dose Verification with Diode in vivo Dosimetry for External Photon Therapy of Head and Neck and Pelvis Cancers during Initial Large-Field Treatments, *Medical Dosimetry* 35, 304-311, 2010 (SCI).
28. P. C. Yu, T. C. Chao, C. C. Lee, C. J. Wu and C. J. Tung, A Monte Carlo Dosimetry Study Using Henschke Applicator for Cervical Brachytherapy, *Nuclear Instruments and Methods A* 619, 411-414, 2010 (SCI).
29. H. Y. Tsai, C. H. Yang, K. M. Huang, M. J. Li and C. J. Tung, Analyses of Patient Dose and Image Quality for Chest Digital Radiography, *Radiation Measurements*, 45, 722-725, 2010 (SCI).
30. M. H. Lin, T. C. Chao, C. C. Lee, T. C. Chang and C. J. Tung, Tissue Classifications in Monte Carlo Simulations of Patient Dose for Photon Beam Tumor Treatments, *Nuclear Instruments and Methods A* 619, 393-396, 2010 (SCI).
31. C. S. Liu, C. J. Tung, Y. S. Chang, F. Y. Hsu and I. J. Chen, Microdosimetry for the

Characterization of the THOR Epithermal Neutron Beam, Radiation Measurements 45,
1120-1123, 2010 (SCI).