

## Prof. Wenhui Xie: Be a professional nuclear medicine doctor, and to seek the unique developmental directions

Received: 24 August 2017; Accepted: 05 September 2017; Published: 21 September 2017.

doi: 10.21037/shc.2017.09.06

View this article at: <http://dx.doi.org/10.21037/shc.2017.09.06>

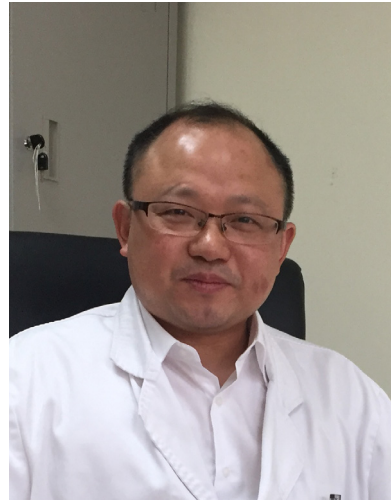
Prof. Wenhui Xie (*Figure 1*), director of the Department of Nuclear Medicine of Shanghai Chest Hospital (SCH), has spent the past 30 years in nuclear medicine. As a highly skillful, compassionate physician, he always strives to achieve accurate and effective diagnosis and treatment; as a highly motivated, innovative researcher, he has overcome many difficulties in his studies.

### Be a professional nuclear medicine doctor

With his passion for nuclear medicine, Prof. Xie has been practicing in this field for nearly thirty years. As an excellent nuclear medicine doctor, Prof. Xie has carried out profound research on the pathophysiology of cancer and has rich clinical experience. He knows clearly about the details of nuclear medicine imaging and images, which enable him to make the accurate, professional judgments on diseases.

Prof. Xie explained the nuclear medicine to us in plain words, “*All the nuclear medicine-related research projects are based on radioactive isotope, which are also known as radionuclides. Thus, we call this discipline as nuclear medicine.*” As a brand new discipline, nuclear medicine uses radionuclide to diagnose, treat, and study disease, which is a new way to understand and manage various diseases.

From single mode such as PET and SPECT to dual modes including SPECT/CT, PET/CT, and PET/MRI, nuclear medicine technology has experienced rapid developments. In particular, the successful application of PET/CT has greatly encouraged Prof. Xie and many other nuclear medicine professionals who are full of exploratory zeal to further study the multi-mode imaging technology. Prof. Xie was particularly excited when he talked about the multimodal imaging and image fusion techniques in nuclear medicine. In his opinion, when high-resolution CT images are fused with highly sensitive functional images on the same machine, they can not only clearly reveal the subtle structural changes in the lesion site but also enables the direct observation of the changes of metabolism, blood flow, and function in this region. Therefore, the new techniques



**Figure 1** Prof. Wenhui Xie.

have achieved specific, sensitive, accurate, and noninvasive localization of lesions in a qualitative, quantitative, and regular manner, which was once unimaginable. For all the nuclear medicine professionals, one of the most important priorities is to continuously improve the sensitivity, specificity and accuracy of nuclear medicine imaging technology for disease diagnosis, so as to further realize the accurate quantification of nuclear medicine imaging technology and directly benefit the patients.

The Department of Nuclear Medicine in Shanghai Chest Hospital has constantly introduced many new instruments. Today machines and equipment for SPECT/CT and PET/CT have been widely used in this hospital. The annual number of SPECT examinations performed in the Department of Nuclear Medicine has reached about 12,000, that of PET-CT is about 3,500. Prof. Xie noted that PET-CT plays an important role in clinical research and efficacy evaluation of lung cancer. The response rate of chemotherapy for lung cancer is only 30%. However, the application of PET-CT can identify patients who cannot benefit from chemotherapy as early as possible, thereby

shortening the duration of ineffective treatment and allow these patients to choose a more effective treatment protocol. By doing so, it not only reduces the patient's physical and mental damage but also lowers the medical costs, which reflects both the "professionalism" and the "medical benevolence".

During the interview, Prof. Xie also explained the phenomenon of "nuclear fear". During a nuclear medical examination, only a trace dose of short-lived nuclides are introduced into the body. Once injected into the patients, the radiation decays rapidly over time and will not interfere with the physiological balances in human body or interfere with other imaging examinations. In fact, different types of radiation exist in air, soil, television, computers, mobile phones, and airplane, and therefore human body is always exposed to certain doses of radiation. Like these daily radiation, the radiation in the body after a PET/CT examination has already been at a fairly low level and will not cause any harm or impact to the patient or the medical staff. In addition, Prof. Xie also mentioned that studies have shown that low-dose radiation exposure not only will do no harm to human body but also may stimulate the immune system and promote its self-repair. Therefore, a correct understanding of nuclear medicine and avoiding unnecessary fear can help nuclear medicine play a greater role in the diagnosis and treatment of diseases.

When asked about his expectations about the *Shanghai Chest*, Prof. Xie hopes that the journal will be able to dig more deeply into the knowledge and skills in Shanghai Chest Hospital and share them with international peers. Also, he hopes that the journal will help young doctors at SCH publish more scientific articles of high quality and with new ideas, so as to improve their academic levels and promote their academic careers.

### Research in the Department of Nuclear Medicine

As director of the Department of Nuclear Medicine at SCH, Prof. Xie said proudly that this department was best suited for SCH. The three major roles of nuclear medicine—diagnosis, staging and efficacy assessment of lung cancer; diagnosis of bone metastasis of lung cancer; assessment of the surgical treatment of coronary heart disease and judgment of the rehabilitation—are closely related with SCH. Particularly, Prof. Xie and his team have carried out a series of scientific research on the diagnosis and treatment of lung cancer: glucose metabolism features and its mechanism in patients with non-small cell lung

cancer; MDP metabolism features and its mechanism in patients with bone metastasis of lung cancer; strategy for evaluating the efficacy of  $^{18}\text{F}$ -FDG PET/CT in non-small cell lung cancer; and,  $^{18}\text{F}$ -FDG PET/CT metabolism imaging features of solitary pulmonary nodules. These studies provide a reliable scientific basis for the rational establishment of individualized diagnosis and treatment protocols for lung cancer. Meanwhile, together with other departments, the Department of Nuclear Medicine has performed a large number of clinical studies on cardiac microvascular disorders. In recent years, the Department of Nuclear Medicine has published many high-quality articles in top international journals including *Cancer Research*, *Hellenic Journal of Nuclear Medicine*, *Cancer Biotherapy and Radiopharmaceuticals*.

Prof. Xie also introduced us the three research directions in the Department of Nuclear Medicine, including the establishment of cell strains and animal models, the high-throughput screening of drug polypeptides *in vivo*, and treatment efficacy monitoring for lung cancer by using molecular imaging. Among them, the research on the high-density screening of peptides in organism is especially unique. With a target to identify one or more small-molecule polypeptides for tumor imaging, Prof. Xie went the opposite way: first, his team synthesized a series of structural polypeptides for radioactive labeling; then, by tracing the source, they screened such polypeptide(s) in animal bodies one site after another; when a polypeptide was specifically enriched in the tumor site, the reason of the enrichment would be further explored. This method can not only accurately determine the research direction but also make the whole research process efficient and simple.

With his professionalism, expertise, and spirit of innovation, Prof. Xie has never stopped his exploration in nuclear medicine. Under his leadership, all the staffs in the Department of Nuclear Medicine of SCH are committed to achieving the motto of "Skilled in Medicine and Sincere in Patient Care". Today, the department has increasingly become a well-recognized center both at home and abroad due to its unique developmental directions and research approaches.

### Edpert's introduction

Wenhui Xie, chief physician, doctor of medicine, supervisor of master's degree, and director of the Department of Nuclear Medicine of Shanghai Chest Hospital. He also serves as the member of Chinese Society of Nuclear

Medicine, standing member of Chinese Medical Doctor Association Nuclear Medicine Branch, member of the expert committee of Shanghai Municipal Nuclear Medicine Quality Control Center, member of Nuclear Medicine Committee of Shanghai Municipal Association of Integrative Medicine, vice chairman of Chinese Society of Nuclear Medicine Information and Media Group, member and secretary of Chinese Society of Nuclear Medicine Oncology Branch, and corresponding member of the editorial board of Chinese Journal of Nuclear Medicine. His research interests include nuclear cardiology and tumor nuclear medicine. He is particularly interested in PET/CT and SPECT/CT for the molecular imaging of lung tumors, identification of bone metastasis of tumors, nuclear medicine-based differential diagnosis of heart diseases (e.g., coronary heart disease), and radionuclide therapy for bone metastasis of tumors.

### Acknowledgments

*Funding:* None.

### Footnote

*Provenance and Peer Review:* This article was commissioned

by the Editorial Office, *Shanghai Chest*. The article did not undergo external peer review.

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/shc.2017.09.06>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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(Editor: Monica L. Liu, Silvia L. Zhou; Translator: Liangjun Gu; SHC, [shc.amegroups.com](http://shc.amegroups.com))

doi: 10.21037/shc.2017.09.06

**Cite this article as:** Liu ML, Zhou SL. Prof. Wenhui Xie: Be a professional nuclear medicine doctor, and to seek the unique developmental directions. *Shanghai Chest* 2017;1:40.