European Journal of Nuclear Medicine and Molecular Imaging (2024) 51:320–322
https://doi.org/10.1007/s00259-023-06541-5

EDITORIAL

Why chose nuclear medicine: the journey of two medical imaging students in China

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Published online: 28 November 2023

We are pleased to share our journey and the reasons behind choosing nuclear medicine for our advanced academic and professional endeavors. As undergraduate students in medical imaging from China, we are enthusiastic about commencing our Master's degree program at Union Hospital, Tongji Medical College, Huazhong University of Science and Technology.

Medical education and career trajectories in China

In China, the typical duration of medical education for undergraduate students spans five years. For those enrolled in clinical medicine, the curriculum initiates with a year of general education, followed by 1.5 years dedicated to preclinical medical courses. Subsequently, students undergo a year of clinical medicine courses, culminating in a 1.5-year internship at university-affiliated hospitals. Should students opt for alternative specializations within the medical field, the course structure may exhibit slight variations. Specialized majors, such as stomatology, medical imaging, and anesthesiology, incorporate additional courses tailored to the specific requirements of each discipline.

Diverging from the globally prevalent medical education system, upon the completion of a bachelor's degree, Chinese medical graduates typically face three choices: embarking on a Master's degree program, applying for standardized residency training and positions in hospitals, or exploring opportunities beyond academia and the medical domain. Notably, esteemed hospitals increasingly demand elevated qualifications for available positions, often stipulating the necessity of a Master's or even a doctorate. Consequently, close to half of the students opt to pursue advanced studies through Master's degree programs, aiming to enhance their professional standing and income prospects.

In China, the Master's degree in medicine is subdivided into two distinct tracks: professional and academic. The professional Master's degree program integrates standardized training, with a significant emphasis on practical clinical training within hospitals. Conversely, the academic Master's degree program places a greater focus on research and the pursuit of original contributions to the field of medicine. Students in academic programs are primarily involved in research projects conducted in laboratories or research institutions. Concerning doctoral programs, professional students typically undertake clinical or laboratory research projects, based on specific requirements from their mentors or research groups. In comparison with academic students, research projects for professional students may be more concentrated on practical clinical issues. However, it is also true that academic students may dedicate more time to laboratories, delving deeper into fundamental questions such as mechanisms.

The rationale behind choosing nuclear medicine: advantages and opportunities

Nuclear medicine, which utilizes radiopharmaceuticals for targeted imaging and therapy, has captivated undergraduate students like us, prompting our decision to specialize in this field. Diverging from conventional structural imaging, nuclear medicine non-invasively monitors

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physiological activities in vivo, providing a window into molecular imaging and the forthcoming era of precision medicine.

As a career path, nuclear medicine presents a distinctive opportunity for imaging students with aspirations of becoming clinical physicians. The nuclear medicine department integrates both diagnostic and therapeutic aspects into daily clinical practice. Therefore, students in this field have the opportunity to specialize in imaging while actively engaging in clinical treatment. This sets nuclear medicine apart from other imaging departments, such as radiology and ultrasound.

With a pronounced focus on scientific research, nuclear medicine provides an exceptional platform for students seeking academic degrees. Participation in research projects enables students to undergo comprehensive training in scientific research within nuclear medicine laboratories. Particularly noteworthy is the Department of Nuclear Medicine at Wuhan Union Hospital, distinguished as one of the few departments in China with the capability to independently develop innovative radiopharmaceuticals. Consequently, as an academic Master's or Ph.D. student, there exists an opportunity to contribute to the development and even witness the commercialization of new radiopharmaceuticals.

Nuclear medicine is a relatively nascent discipline in China, presenting considerable potential for expansion and opportunities. Given its multidisciplinary nature, nuclear medicine draws professionals from field such as physics, chemistry, pharmacy, clinical medicine, and medical imaging. Amid the evolving landscape of new concepts and technologies, including artificial intelligence and radiomics, ongoing learning is imperative for nuclear medicine professionals. This interdisciplinary environment provides individuals with the platform to optimize their strengths and capabilities.

Guided by China's *Healthy China initiative*, precision medicine has emerged as a crucial direction for the future development of healthcare, aligning seamlessly with the objectives of nuclear medicine. Furthermore, China's burgeoning aging population poses distinctive healthcare challenges, notably an elevated burden of cancer. Nuclear medicine has exhibited remarkable strides in cancer diagnosis and treatment, introducing innovative methodologies like targeted radiotherapy and theranostics in recent years. These advancements address the particular requirements of the aging population, providing more effective and precise treatment alternatives. Therefore, we hold a firm believe that nuclear medicine will contribute significantly to healthcare advancements in China.

Starting new chapters: opening up to attract more youth

In China, nuclear medicine is an emerging discipline and therefore remains relatively unfamiliar to the general public. Persistent misconceptions regarding radiation dangers prevail among both the public and certain clinical doctors. Additionally, undergraduate students lack familiarity with nuclear medicine, owing to limited instructional hours dedicated to the subject and a scarcity of nuclear medicine physicians in university hospitals. These factors likely contributed to the human resource challenges within this field.

Reflecting on how to attract more young people, our personal journey may provide a firsthand narrative. In our senior year, we sought to explore potential majors and future research directions by applying to join a laboratory. We firstly joined a research project on liver fibrosis in the Department of Nuclear Medicine led by doctoral students. Through a series of experiments, we acquired foundational knowledge of general procedures for animal experimentation in nuclear medicine, encompassing cell culture, animal modeling, probe synthesis, animal imaging, and advanced techniques such as western blot and flow cytometry. These experiments formed our initial impressions of pre-clinical research in nuclear medicine and helped us gain an intuitive understanding of the sophisticated laboratory equipment. Earlier this year, we engaged in separate clinical research projects focusing on the role of PET/CT in immunotherapy monitoring. During this period, the richness of the "clinical case database" at Union Hospital left a lasting impact, solidifying our determination to choose nuclear medicine as our specialized major. Drawing from our experiences, we firmly believe that by providing more opportunities for medical students to interact with nuclear medicine, such as through lab tours and undergraduate science projects, can attract more young individuals to the field, much like our own journey.

The nuclear medicine department at Wuhan Union Hospital was established in the 1970s, which marks a 50-year journey filled with both triumphs and challenges. Coincidentally, this year also commemorates the 50th anniversary of European Journal of Nuclear Medicine and Molecular Imaging (EJNMMI), a publication that has played a vital role in disseminating knowledge and contributing significantly to the understanding and development of nuclear medicine and molecular imaging [1]. We feel honored to share this period of history with EJNMMI. The core spirit of this evolving discipline lies in the pursuit of profound research, innovation, and a willingness to embrace challenges. Looking ahead, we believe that more young individuals will join the field of nuclear medicine, embarking on a remarkable journey for academic and professional pursuits, just like we have.

Funding This work was supported by Hubei Province Teaching and Research Project of Higher Education Institutions (No. 2022044) and Graduate Teaching Reform Project of Huazhong University of Science and Technology (No. ZD009).

Declarations

Conflict of interest The authors declare no competing interests.

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