

## Creation the fully integrated and flourishing assessment challenge award: Integration is the key

Majid Assadi

The Persian Gulf Nuclear Medicine Research Center, Department of Molecular Imaging and Radionuclide Therapy, Bushehr Medical University Hospital, Bushehr University of Medical Sciences, Bushehr, Iran

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### ABSTRACT

Medicine is now undertaking a paramount revolution that will alter the nature of healthcare from reactive to proactive. It is imperative to integrate experimental and computational investigation in order to appreciate complex biological systems in the era of precision medicine. In light of this revolution, we necessitate to precision medicine means such as systems approaches (genomics, radiogenomics, transcriptomics, proteomics, and metabolomics) and also imaging techniques. In addition to technological issues, the fast growth of precision medicine needs dedicated future leaders with a strong foundation in advanced genomic medicine, so that these leaders should assimilate personalized medicine into healthcare, and they must attain many additional management and teaching skills. On other hand, nowadays, universities beyond that primary mission in training health workers utilize novel protocols for providing a scientific and competitive atmosphere to identify talented students. The fully integrated and flourishing assessment (FIFA) challenge promote cross-disciplinary nuclear medicine related sciences integration within universities. The FIFA challenge could be presented where a place every year active nuclear medicine discipline students in the worldwide can involve their skills for an award program and all the recognition provided by our societies. Developing of such program may simplify the inclusion of all fields which are integrated with nuclear medicine and molecular imaging, entailing integrated molecular, functional and morphological big imaging data generated with various technologies, integrated therapeutic options, quantitative examinations such as radiomics and radiogenomics and also artificial intelligence applications.

**Key words:** Molecular imaging; Discipline; Nuclear medicine; Integration; Precision medicine

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**Corresponding author:** Dr. Majid Assadi, The Persian Gulf Nuclear Medicine Research Center, Bushehr University of Medical Sciences, Bushehr, Iran. E-mail: [assadipoya@yahoo.com](mailto:assadipoya@yahoo.com)

### Rationale behind the developing a new program

Medicine is now undertaking a paramount revolution that will alter the nature of healthcare from reactive to proactive. It is imperative to integrate experimental and computational investigation in order to appreciate complex biological systems in the era of precision medicine [1]. In light of this revolution, we necessitate to precision medicine means such as systems approaches (genomics, radiogenomics, transcriptomics, proteomics, and metabolomics) and also imaging techniques [2].

Furthermore, molecular imaging is developing to entail a couple of imaging techniques to enable in vivo monitoring of cellular and molecular processes. Crucial to the development and translation of molecular imaging is interdisciplinary teamwork across many branches, entailing radiology, nuclear medicine, pharmacology, chemistry, molecular and cell biology, physics, mathematics, and engineering [1, 3, 4].

These progresses in systems biology associated with modern analytical and also quantitative imaging software tools are helping to construct a more complete picture of many disease related signaling pathways and personalized management [5-7].

In contrary, systemic approach is encountering the challenges of analyzing enormous biological networks and big molecular biological data today, thus ongoing technological progresses, especially in the field of systems biology and imaging, and also interdisciplinary integration with various branches of science are compulsory for the implementation of precision medicine [6].

In addition to technological issues, the fast growth of precision medicine needs dedicated future leaders with a strong foundation in advanced genomic medicine, so that these leaders should assimilate personalized medicine into healthcare, and they must attain many additional management and teaching skills.

While, universities remarkably aimed to train people to develop and maintain health system in the past. Nowadays, universities beyond that primary mission in training health workers utilize novel protocols for providing a scientific and competitive atmosphere to identify talented students. The purpose of such approaches as an instance in nuclear medicine may promote health system performance, teaching the skills of reasoning and problem solving, considering creative and critical thinking, admiring teamwork and also encouraging interdisciplinary collaborations. What's more, developing such competitions might nurture students more self-confident, helps in selecting their future career, guides, trains their scientific abilities, and promotes creativity, innovation and problem-solving skills among them [8, 9]. Furthermore, such approaches may have some advantages for universities such as cooperation and

interrelationship between universities, distinguishing and applying new educational methods, training and planning talented students [8, 9].

### The challenge

The Fully Integrated and Flourishing Assessment (FIFA) Challenge promote cross-disciplinary nuclear medicine related sciences integration within universities. The FIFA Challenge could be presented in a place every year where talented students active in nuclear medicine discipline in the worldwide, can apply their skills for an award program and all the recognition provided by our societies.

Developing of such program may simplify the inclusion of all fields which are integrated with nuclear medicine and molecular imaging, entailing integrated molecular, functional and morphological extensive imaging data generated with various technologies, integrated therapeutic options, quantitative examinations such as radiomics and radiogenomics and also artificial intelligence applications.

The strong link between our society associations and the universities throughout the world primarily may make it possible mutual growth to the level of excellence.

For students it is an experience firstly in focusing on the nuclear medicine field, and its features, secondly not to rely blindly on protocols, models and their outcome. In addition the challenge is developed with the aim to promote cross disciplinary nuclear medicine related fields integration within universities. Each participating university will have a multidisciplinary team of nuclear medicine related students, with a maximum of one PhD/resident/assistant student per team. This scientific competition begins with a first round with an assignment that is provided by our societies. The defined number of selected teams will be assigned to analyze and offer a plan for a particular medical issue to be presented to a committee for selection of the best plan.

Teams can consist of students from some or all of the following disciplines: nuclear medicine resident/assistant, nuclear medicine technologist, pharmacy/ radiopharmacy, computer science/artificial intelligence, chemistry, biology /genetic, mathematics, physics, bioengineering, electrical engineering, mechanical engineering.

The field of nuclear medicine and molecular imaging is an integral turning point of personalized medicine: a modern approach for the diagnosis and therapy.

### An example

Scientific committee of this program determines a medical issue in field of nuclear medicine every year

which should be shared with other disciplines e.g. Radiomics/Radiogenomics using SPECT/PET/CT & MRI with artificial intelligence for precision medicine in lung cancer and share the available data and ask participant teams to present the best approach in this integrated dilemma.

Our societies could name the FIFA Challenge for a distinguished scientist and renowned author, who is paving the way for the education of new generations of nuclear medicine scientists and has a great contribution to the nuclear medicine profession, and in evoking exceptional creative spirit.

We are ready to define the detail conditions of participation, faculty advisors, consultancy and also types of award regarding this exciting challenge.

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