Multidisciplinary Cancer Investigation **Editorial**

January 2017, Volume 1, Issue 1

Multidisciplinary Cancer Investigation: A New Path to Delve into the Ocean of Cancer Sciences

Keivan Majidzadeh-A [1, *]

[1] *Breast Cancer Genetics Department, , Breast Cancer Research Center, ACECR, Tehran, Iran*

* *Corresponding author: Keivan Majidzadeh-A, Breast Cancer Genetics Department, Breast Cancer Research Center, ACECR, Tehran, Iran. E-mail: kmajidzadeh@razi.tums.ac.ir*

DOI: 10.21859/mci-010110

Submitted: 29 July 2016

Revised: 2 August 2016

Accepted: 13 August 2016

ePublished: 08 September 2016

Keywords:
Neoplasms
Multidisciplinary approach
Therapeutics
Diagnosis

© 2016. Multidisciplinary Cancer Investigation

On behalf of the editorial and executive board members, it is my great pleasure to present the Multidisciplinary Cancer Investigation Journal.

The rapid growth of medical sciences has necessitated the development of platforms to distribute and publish the results of research projects, and declare new discoveries. Among all medical disciplines, cancer is the one that involves the largest number of scientists, and is counted among the most important areas of research and discovery, for a number of reasons, including:

1. Its high impact on public health. Globally, cancer is identified among the leading causes of morbidity and mortality. Recent statistics have shown some 14.1 million new cancer cases and 8.2 million cancer deaths annually, while some 32.6 million people were living with cancer in 2012 around the world [1].

2. Cancer is a mysterious disease, and this mystery in itself is an attraction. Many scientists around the world are striving to identify the root causes of cancer, and they generally believe cancer to be a genetic disease, with its complex processes commencing with a sole mutation and proceeding with other mutations [2]. Each mutation or group of mutations confers a new characteristic to this fast growing cellular mass, including angiogenesis, anti-apoptosis, extracellular matrix break and etc. [3]. A minority of scientists, on the other hand, believe that malignancy originates from the micro-environment of the cell and mutational processes occur afterward [4, 5]. Moreover, there are sporadic attitudes and observations in parapsychology and pseudoscience regarding the origin of cancer, which claim that the human body possesses dimensions beyond its corporal composition, some of which are physical and others metaphysical [6]. According to these unproved approaches that can be named dimensional medicine, tumorigenic events begin from these dimensions, and mutational processes or micro-environmental changes follow. Therefore, major mysteries are still to be uncovered, and that has made cancer attractive in the eyes of many scientists seeking the answer to such questions.

3. Many novel approaches to the treatment and even eradication of cancer have recently emerged. Some of which are:

The targeted therapy approach, in which lots of monoclonal antibodies have been developed to target the principal role players in cancer signaling pathways [7]; the cancer stem cell approach, which suggests the extermination of tumor to be dependent on the annihilation power of cancer stem cells; the immunotherapy and cell therapy approach that relies on training of the host's immune system to defend against cancer cells [8]; and finally, the personalized medicine approach, the great achievement of pharmacogenomics and biomarker discovery, especially with the help of high throughput technology, which has faced the challenge of big data in its primary phases of introduction to the community [9]. This challenge has opened a new window for the involvement of many other professionals, such as bioinformaticians, statisticians, and software designers to solve this recent challenge. Statistical model-based software would be the main outcome of the efforts of such professionals. Such software is able to predict sensitivity and resistance to each specific treatment for each specific patient, and also predict prognosis and survival of cancer patients based on their biomarker profile.

4. Integrative Medicine in cancer has brought many professionals of alternative and complementary medicine to the scene to present their potential, especially to raise the quality of life of cancer patients [10].

5. There are also numerous professionals of non-medical specialties, such as electromagnetic, photonic, biomaterial and many other engineers, which have

[Downloaded from mcijournal.com on 2026-09-04]

[DOI: 10.21859/mci-010110]

entered the field of cancer and created an interdisciplinary atmosphere of research. Recently, microfluidic-based platforms have shown the potential of paradigm change in critical areas of cancer research, such as biomarker discovery, molecular diagnostics, tumor biology and high-throughput screening for therapeutics; liquid biopsy for isolation of circulating tumor cells (CTC), cell-free DNA and nano-vesicles, such as exosomes, is one of its important potentials. Furthermore, as an alternative to conventional monolayer cell culture and animal models, modeling of primary tumors on microfluidic-based chips will change the face of cancer research in the near future. These three-dimensional models can be applied to investigate cancer growth and metastasis, drug target discovery for immunotherapy purposes, testing drug compounds, and also associated companion diagnostics [11, 12].

All of the above approaches to various aspects of cancer have engaged many different professionals and scientists worldwide. Cancer has thus encompassed diverse areas of science and technology to encounter challenges. However, the separate involvement of each discipline would not be greatly beneficial, and what is required is a suitable atmosphere where disciplines can influence one another. This highlights the urgent need to gather all the relevant professionals to discuss and reach a mutual understanding of the interdisciplinary points of view and new insights into cancer. That is, we need a multidisciplinary cancer investigation to achieve the target. In this journal, we attempt to highlight and facilitate the spreading of such approaches. We look forward to receiving meritorious manuscripts and works from around the world, and disseminating them for the benefit of all enthusiastic scientists thirsty for progress.

REFERENCES

1. World Health Organization. All Cancers (excluding non-melanoma skin cancer) Estimated Incidence, Mortality and Prevalence Worldwide in 2012 2012. Available from: http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx.
2. Wishart DS. Is Cancer a Genetic Disease or a Metabolic Disease? EBioMedicine. 2015;2(6):478-9. DOI: 10.1016/j.ebiom.2015.05.022 PMID: 26288805
3. Loeb KR, Loeb LA. Significance of multiple mutations in cancer. Carcinogenesis. 2000;21(3):379-85. PMID: 10688858
4. Blaylock RL. Cancer microenvironment, inflammation and cancer stem cells: A hypothesis for a paradigm change and new targets in cancer control. Surg Neurol Int. 2015;6:92. DOI: 10.4103/2152-7806.157890 PMID: 26097771
5. Wu A, Liao D, Tlsty TD, Sturm JC, Austin RH. Game theory in the death galaxy: interaction of cancer and stromal cells in tumour microenvironment. Interface Focus. 2014;4(4):20140028. DOI: 10.1098/rsfs.2014.0028 PMID: 25097749
6. Atwood KCt. Naturopathy, pseudoscience, and medicine: myths and fallacies vs truth. MedGenMed. 2004;6(1):33. PMID: 15208545
7. Oldham RK, Dillman RO. Monoclonal antibodies in cancer therapy: 25 years of progress. J Clin Oncol. 2008;26(11):1774-7. DOI: 10.1200/JCO.2007.15.7438 PMID: 18398141
8. Reya T, Morrison SJ, Clarke MF, Weissman IL. Stem cells, cancer, and cancer stem cells. Nature. 2001;414(6859):105-11. DOI: 10.1038/35102167 PMID: 11689955
9. Ledford H. Researchers push for personalized tumour vaccines. Nature. 2016;532(7600):425. DOI: 10.1038/nature.2016.19801 PMID: 27121818
10. Li Y, Zhu X, Bensussan A, Li P, Moylan E, Delaney G, et al. Herbal Medicine for Hot Flushes Induced by Endocrine Therapy in Women with Breast Cancer: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2016;2016:1327251. DOI: 10.1155/2016/1327251 PMID: 27418936
11. Skardal A, Shupe T, Atala A. Organoid-on-a-chip and body-on-a-chip systems for drug screening and disease modeling. Drug Discov Today. 2016. DOI: 10.1016/j.drudis.2016.07.003 PMID: 27422270
12. Paul CD, Hung WC, Wirtz D, Konstantopoulos K. Engineered Models of Confined Cell Migration. Annu Rev Biomed Eng. 2016;18:159-80. DOI: 10.1146/annurev-bioeng-071114-040654 PMID: 27420571

[Downloaded from mcijournal.com on 2026-09-04]

[DOI: 10.21859/mci-010110]