



Correspondence

Why India needs more exosome research for cancer?

Dear editor,

Exosomes are the subpopulation of extracellular vesicles, originating from the plasma membrane. It is associated with cellular communication in healthy and pathological both phases [1]. Current decay, exosome-based research is the most emphasized field, and it explains pathological consequences dynamically. The relationship between cancer and exosomes are getting decoded gradually. It is built of many physiologically active components including DNA, RNA, protein, and lipid. This molecule regulates cancer in a more complex manner. In cancer, tumor derives exosomes (TDXs) has a relation with tumor microenvironment (TME) cell signalling. The groups of cellular alteration that take place such as developing uncontrol cellular proliferation, angiogenesis, metastasis, epithelial-mesenchymal transition (EMT) [2] and organ-specific metastasis [3]. Recent scientific findings mention that interestingly exosome and cancer stem cells are also interlinked [4]. TDXs reprogram the immune cells [5] dynamically. TDXs mediated macrophage 2 (M2) subpopulation polarization and promote EMT. It also alters the anticancer cytotoxic effect of cytotoxic T cells (Tc) and Natural killer cells (NK). TDXs change the Th17 and Treg cell population balance in the immune system which enhances the tumor development in the more aggressive pattern. Exosome surface integrin leads to organ-specific cancer metastasis. In cancer metastasis, one of the most vital events is extracellular matrix remodelling (EMC) and this event is also influenced via TDXs -associated molecules signature (fibronectin, integrin). The most exciting and complex cancer progression stage is EMT [6] which is regulated by TDXs-related active molecules such as miRNA, long noncoding RNA and circRNA. TDXs are the source of several cancer biomarkers. Exosome-based research transforms cancer biomarkers [7] research and introduces a new era of liquid biopsy. Exosome and nanotech combinations create a new generation of diagnostic tools, exosome-based drug delivery [8], and therapeutics for cancer. This innovative approach supports overcoming several cancer diagnostics barriers like early detection (exosome-based sensor) [9], specific drug delivery (Exosome surface modification) and low side effect drug (exosome are more biocompatible with non-toxic) [10] development.

In India, very micro-scale [11] exosome research activity is going on. According to several statistics of upcoming time, a large pullulation suffers from cancer in India. In future, exosomes may be the best option for dealing with cancer-associated health crises. All this evidence suggests exosome research might improve India's cancer treatment approach (cost-saving, early detection, more specific and efficient treatment). India has a high percentage of quality researchers, scientists and clinical expertise. It is important to create a work together ecosystem (where multidisciplinary scientific minds will work together for a better solution). It is also important to develop a good infrastructure for exosome researches. Based on exosome research, we may work

together to confront impending health challenges creatively and effectively.

Ethical approval

Not needed. It is a letter.

Funding

None.

Author contribution

Conceptualization: Dattatreya Mukherjee, Writing: Rajib Dhar, Sukhamoy Gorai, Anand Krishnan, Review with Critical Comments: Anand Krishnan, Dattatreya Mukherjee, Editing: Dattatreya Mukherjee.

Registration of research studies

Name of the registry: NA

Unique Identifying number or registration ID: NA

Hyperlink to your specific registration (must be publicly accessible and will be checked): NA

Guarantor

All authors.

Consent

Not needed, It is a letter.

Declaration of competing interest

None.

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<https://doi.org/10.1016/j.amsu.2022.104265>

Received 10 July 2022; Accepted 19 July 2022

Available online 31 July 2022

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Rajib Dhar
Department of Genetic Engineering, SRM Institute of Science and
Technology, Kattankulathur, TamilNadu, 603203, India
E-mail address: rajibdhar0001@gmail.com.

Sukhamoy Gorai
Rush University Medical Center, 1620 W Harrison St, Chicago, IL, 60612,
United States
E-mail address: sukhamoygorai1@gmail.com.

Anand Krishnan
Department of Chemical Pathology, School of Pathology, Faculty of Health
Sciences, University of the Free State, Bloemfontein, 9300, South Africa
E-mail address: krishnana@ufs.ac.za.

Dattatreya Mukherjee*
Raiganj Government Medical College and Hospital, Uttar Dinajpur, West
Bengal, India

* Corresponding author. Raiganj Government Medical College and
Hospital, Uttar Dinajpur, West Bengal, India.
E-mail address: dattatreyamukherjee4u@outlook.com (D. Mukherjee).