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Review Article

Cancer Bone Metastasis, Circulation Biomarker Profiling

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Abstract

Cancer bone metastasis was common features for cancer patients. It is very painful for patients and therapeutic resistance in the clinic. Drug treatment needs to improve for both growth inhibition and symptom management. To promote therapeutic paradigms, clinical drug treatment should be personalized by different platforms and paradigms. This editorial discusses bone cancer metastasis treatment in personalized medicine.

Keywords: *Bone Cancer; Neoplasm Metastasis; Drug Treatment; Clinical Trial*

Introduction

Cancer is the secondary leading mortality for all diseases worldwide [1-4]. 70 - 90% cancer death is caused by neoplasm metastasis. Cancer bone metastasis is one of frequent cancer metastasis events in the clinic [5-9]. Drug treatment needs to improve for both growth inhibition and symptom management to avoid this devastating incidence and human mortality, drug treatment study should be specified. This editorial discusses the landscape of drug treatment in the clinic.

Clinical dilemma

There are a lot of different anticancer drugs in the clinic. How to determine drug responses in individual patients is challenging [10-18].

Experimental Study

Vast tumor models and technology *in vivo* and *in vitro*

Drug evaluation for neoplasm metastasis progressed a lot [10,11]. There are a lot of different tumor models *in vitro* [12-19] and *in vivo* [20-26]. There has been evolving in technology of miniature and in living animals [26-28]. Thus, treatment progress has been made. Yet, there is little progress in clinical trials. Several reasons are attributed.

Clinical utility

Clinical treatment evaluation is very different from experimental study. In experimental study, we can receive data of drug responses from animal at any times and any organs.

However, these processes are not allowed at clinical evaluation. Biopsy is the common procedure for pathological and diagnostic evaluation in the past. This procedure is relative difficult to perform in bone metastases evaluation. Facing with this dilemma, blood circulatory tumors or their biomarkers are new hopes for therapeutic selection and successes [26-28]. They can be determined for herbal medicines or other types of clinical cancer treatment [29-31]. This diagnostic new trend is useful for further treatment updating.

Personalized medicine

In the future, by utility of circulatory biomarkers, personalized medicine for bone metastasis can be practiced. Personalized medicine is a useful drug selection paradigm that may optimize drug treatment [32-37]. This is a new trend for clinical cancer trials. This emerging medical system is progressing rapidly.

Drug combination commonly promotes clinical outcomes yet mechanisms are obscure. In the past decade, several pathways and mechanisms are proposed [37-39]. Large volume of such research may be followed in upcoming decades. Including many pharmaceutical progresses [40], clinical cancer treatment will be disciplinary changes.

Conclusion

Experimental and clinical study of cancer bone metastasis should be emphasized for patient's survival benefiting. New knowledge should be received and utilized, like circulatory tumor cells or biomarker diagnostics and drug sensitivity testing. Many new discoveries could be obtained by these experimental and clinical investigations.

Bibliography

1. Lambert AW., *et al*. "Emerging biological principles of metastasis". *Cell* 168.4 (2017): 670-691.
2. Ahmad AS., *et al*. "Trends in the lifetime risk of developing cancer in Great Britain; Comparison of risk for those born from 1930-1960". *British Journal of Cancer* 112.5 (2015): 943-947.
3. Mehlen P and Puisieux A. "Metastasis; a question of life or death". *Nature Reviews Cancer* 6.6 (2006): 449-458.
4. Weidenfeld K and Barkan D. "EMT and stemness in tumor dormancy and outgrowth: Are they intertwined processes?" *Frontiers in Oncology* 8 (2018): 381.
5. Lu DY and Xu B. "Bone metastasis treatment, major frontiers". *Acta Scientific Orthopaedics* 4.7 (2021): 1-2.
6. Hakim BAA. "Benign bone tumors, an overview". *Acta Scientific Orthopaedics* 4.10 (2021): 1-2.
7. Lu DY and Xu B. "Bone cancer and metastatic trials, drug treatment". *Acta Scientific Orthopaedics* 4.9 (2021): 31-33.
8. Lu DY., *et al*. "Cancer metastasis treatments". *Current Drug Therapy* 8.1 (2013): 24-29.
9. Bhadresha KP., *et al*. "A predictive biomarker panel for bone metastasis, liquid biopsy approach". *Journal of bone oncology* 29 (2021): 100374.
10. Lu DY and Xu B. "Cancer bone metastasis, experimental study". *Acta Scientific Orthopeadics* 5.12 (2022): 1-3.
11. Lu DY., *et al*. "Anti-metastatic drug development, work out towards new direction". *Medicinal Chemistry* 8.7 (2018): 192-196.
12. Lu DY., *et al*. "Anticancer drug sensitivity testing, a historical review and future perspectives". *Current Drug Therapy* 10.1 (2015): 44-55.

13. Volm M and Efferth T. "Prediction of cancer drug resistance and implications for personalized medicine". *Frontiers in Oncology* 5 (2015): 282.

14. Lu DY and Lu TR. "Drug sensitivity testing, a unique drug selection strategy". *Advances in Biomarker Sciences and Technology* 2 (2020): 59-66.

15. Montero J., *et al*. "Drug-induced death signaling strategy rapidly predicts cancer response to chemotherapy". *Cell* 160.5 (2015): 977-989.

16. Popova AA and Levkin PA. "Precision medicine in oncology: In vitro drug sensitivity and resistance test (DSRT) for selection of personalized anticancer therapy". *Advanced Therapeutics* 3.2 (2020): 1900100.

17. Zhang Y., *et al*. "Anticancer drug sensitivity assay with quantitative heterogeneity testing using single-cell Raman Spectroscope". *Molecules* 23.11 (2018): 2903.

18. Wang JK., *et al*. "*In vitro* anticancer drug sensitivity sensing through single-cell Raman Spectroscopy". *Biosensors* 11.8 (2021): 286.

19. Hammoud MK., *et al*. "Raman micro-spectroscopy monitors acquired resistance to targeted cancer therapy at the cellular level". *Scientific Reports* 8.1 (2018): 15278.

20. Jelgersma C and Vajkoczy P. "How to target spinal metastasis in experimental research: An overview of currently used experimental mouse model and future prospects". *International Journal of Molecular Sciences* 22.11 (2021): 5420.

21. Pantano F., *et al*. "Integrin alpha 5 in human breast cancer is a mediator of bone metastasis and a therapeutic target for the treatment of osteolytic lesions". *Oncogene* 40.7 (2021): 1284-1299.

22. Lu DY and Che JY. "Bone disease treatments, importance of technical supports". *Acta Scientific Orthopaedics* 4.4 (2021): 55-57.

23. Lu DY and Lu TR. "Antimetastatic activities and mechanisms of bisdioxopiperazine compounds". *Anti-Cancer Agent in Medicinal Chemistry* 10.7 (2010): 564-570.

24. Zhu H., *et al*. "DJ-1 mediates the resistance of cancer cells to dihydroarteminisinin through cancer cells through reactive oxygen species removal". *Free Radical Biology and Medicine* 71 (2014): 121-132.

25. Lu DY., *et al*. "Development of antimetastatic drugs by targeting tumor sialic acids". *Scientia Pharmaceutica* 80.3 (2012): 497-508.

26. Eslami-S Z., *et al*. "Functional analysis of circulating tumour cells: the KEY to understand the biology of the metastatic cascade". *British Journal of Cancer* 127.5 (2022): 800-810.

27. Pantel K and Alix-Panabieres C. "Crucial roles of circulating tumor cells in the metastatic cascade and tumor immune escape: biology and clinical translation". *Journal for Immunotherapy of Cancer* 10.12 (2022): e005615.

28. Lu DY., *et al*. "Drug sensitivity testing for cancer therapy, key areas". *Reviews on Recent Clinical Trials* 17.4 (2022): 291-299.

29. Agarwal N., *et al*. "Natural herbs as anticancer drugs". *International Journal of PharmTech Research* 4.3 (2012): 1142-1153.

30. Lu DY., *et al*. "Natural drug cancer treatment strategies from herbal medicine to chemical or biological drug". *Studies in Natural Products Chemistry* 66 (2020): 91-115.

31. Lu DY and Lu TR. "Herbal medicine in new era". *Hospice and Palliative Medicine International Journal* 3.4 (2019): 125-130.

32. Lu DY., *et al*. "Cancer bioinformatics for update anticancer drug developments and personalized therapeutics". *Reviews on Recent Clinical Trials* 12.2 (2017): 101-110.

33. Lu DY., *et al*. "Pharmacogenetics of cancer therapy: breakthroughs from beyond?" *Future Science OA* 1.4 (2015): FSO.80.

34. Hyman DH., *et al*. "Implementing genome-driven oncology". *Cell* 168.4 (2017): 584-599.

35. Lu DY., *et al*. "Individualized cancer chemotherapy integrating drug sensitivity tests, pathological profile analysis and computational coordination-an effective strategy to improve clinical treatment". *Medical Hypotheses* 66.1 (2006): 45-51.

36. Lu DY. "Personalized cancer chemotherapy, an effective way for enhancing outcomes in clinics". Woodhead Publishing, Elsevier, UK (ISBN. 978-0-08-100346-6) (2014).

37. Lu DY., *et al*. "Individualized cancer therapy, future approaches". *Current Pharmacogenomics and Personalized Medicine* 16.2 (2018): 156-163.

38. Lu DY., *et al*. "Anticancer drug combination, how far we can go through?" *Anti-Cancer Agents in Medicinal Chemistry* 17.1 (2017): 21-28.

39. Lu DY., *et al*. "Drug combination in clinical cancer treatment". *Reviews on Recent Clinical Trials* 12.3 (2017): 202-211.

40. Barani M., *et al*. "Recent advances in nanotechnology-based diagnosis and treatments of human osteosarcoma". *Biosensors* 11.2 (2021): 55.

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