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Editorial

Cancer and Cancer Stem Cells

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For a long time scientists and the medical professionals around the world were wondering about the cause of cancer relapse in patients who had responded positively to chemotherapy.

In recent years increasing evidence suggests that cancer originates from a small fraction.

Of tumour initiating cells with the abilities of self-renewal, unlimited propagation, multipotent differentiation and giving rise to phenotypically distinct cells found within the tumour population. Such capabilities share similarity with normal stem cells. Thus these cells are called Cancer Stem Cells (CSC).

The need of the hour is to develop cancer therapy that can kill CSC along with Cancer cells.

In laboratory cancer stem cells can be cultured in non-adherent, non-differentiating serum free conditions to form spheres. In the absence of specific CSC markers for most CSCs, as a functional approach sphere formation is particularly useful to enrich the potential CSC population. The effect of the chemotherapeutic drug on CSC can thus be easily studied by calculating the percentage reduction of spheres compared to the standard chemotherapeutic drug and the drug exhibiting the maximum sphere reduction can thus be selected for the treatment.

Another drawback of the current chemotherapeutic agents is their toxicity on normal cells.

Activity of the chemotherapeutic drug can be tested on Peripheral Blood Lymphocytes and the drug exhibiting no activity on the lymphocytes can be selected for the treatment.

In short, in cancer drug discovery while selecting the lead the candidate, anti –CSC activity and non-toxicity of the candidate on normal cells should be considered to minimize the side effects and to prevent the relapse of cancer.