Lung Cancer Stem Cells and Their Therapeutic Targeting

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Abstract
Lung cancer is responsible for causing more than 1 million deaths worldwide each year making it the most common cancer in humans. It has now been established that lung cancers contain a subpopulation of cancer cells, responsible for tumor initiation, propagation, and metastasis, termed as cancer stem cells (CSCs). However, this stem cell population in lung cancers remains poorly characterized. The present review discusses on the novel cell surface markers that would be required for isolating lung CSCs, and characterization of these important cells. The discussion also elucidates the regulatory signalling pathways involved in their maintenance and the role of miRNA in lung cancer stem cells and prospects of using them as therapeutic targets.

ABBREVIATIONS

Population; BMI-1: BMI1polycomb ring finger oncogene; BASC: renewal and are pluripotent in nature. They have been identified

INTRODUCTION

Identification & targeting of these CSCs causing pre-malignant
classified into Small cell carcinoma and combined small cell

LC-SC markers

stem cells on the basis of certain distinct and specific biomarker
markers specific for LC-SC are discussed here Table 1.

**Key signalling pathways**

regulatory pathway. Watkins et al. reported first on Hh pathway

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<thead>
<tr>
<th>Serial No.</th>
<th>LC-SC marker</th>
<th>Description</th>
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<td>Also associated with reduced survival. Its clinical value and significance as a LC-SC marker remains</td>
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<td>counterparts, suggesting a significant correlation</td>
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<td>an inflammatory cytokine associated with metastatic progression, and this interaction may constitute</td>
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<td>and differentiation, thereby indicating the role of uPAR in identification of CSCs in SCLC</td>
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Table 1:
WNT/β-CA

Therapeutic targeting of LC-SC

miRNA & lung cancer stem cells

Table 2:

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<th>Target</th>
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<td>Treatment with MST312, a telomerase inhibitor could significantly reduce the ALDH+ in vivo</td>
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<td>The anti-psychotic drug, trifluoperazine has been reported to inhibit CSC tumor, of trifluoperazine with either gefitinib or cisplatin could also overcome drug resistance</td>
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<td>treatment with either a gamma-secretase inhibitor (eg: DAPT, MRK-003 &amp; RO4929097) NOTCH3 resulted in a significant decrease</td>
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<td>PI3K/AKT/mTOR</td>
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3) WNT/β-CATENIN pathway

LC diagnosis and that specific miRNA profiles may predict
for improvement in the efficacy of current anti-cancer therapies. SCF-neutralizing tumor cells. Standard chemotherapy combined with the targeting of specific axis of 

**CONCLUSION**

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<td>miR-874 in the CD133+ CSC population leads to significant loss of the CSC phenotype with</td>
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**Targeting of tumor microenvironment**

(i) Weakly acidic pH

The microenvironment of solid tumors is characterized by weakly acidic pH. Biotin conjugated TAT peptide (arginine-rich peptide) when used to increase potency of Dox, lead to reduced tumour size in

**Targeting of ABC transporters**

...
upregulated or downregulated profile in LC-SCs and can be used as markers for stemness of these cells [9], suggesting targeting certain miRNAs shows either an upregulated or downregulated profile in LC-SCs and can be used for the therapeutic potential. This approach of targeting LC-SC holds great potential.

REFERENCES


miRNAs [9]. This approach of targeting LC-SC holds great potential.


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