



Journal of Environmental Pathology, Toxicology and Oncology

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Clarivate
JF: 2.1
Clarivate
5-Year IF: 2.5
Clarivate
Immediacy Index: 1.6
Clarivate
Eigenfactor: 0.00048
Clarivate
JCI: 0.58
SJR: 0.415
SNIP: 0.427
CiteScore™: 3.8
H-Index: 50

Indexed in



Published 4 issues per year
ISSN Print: 0731-8898
ISSN Online: 2162-6537

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Detection of Circulating Tumor Cells and Epithelial Progenitor Cells: A Comprehensive Study

Volume 42, Issue 3, 2023, pp. 1-29

DOI: 10.1615/JEnvironPatholToxicolOncol.2022044456

Submitted: May 22 2022 | Accepted: Jun 27 2022 | Published online: Feb 01 2023



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ABSTRACT

Technological advancement to enhance tumor cells (TC) has allowed discovery of various cellular bio-markers: cancer stem cells (CSC), circulating tumor cells (CTC), and endothelial progenitor cells (EPC). These are responsible for resistance, metastasis, and premetastatic conditions of cancer. Detection of CSC, CTC, and EPC assists in early diagnosis, recurrence prediction, and treatment efficacy. This review describes various methods to detect TC subpopulations such as *in vivo* assays (sphere-forming, serial dilution, and serial transplantation), *in vitro* assays (colony-forming cells, microsphere, side-population, surface antigen staining, aldehyde dehydrogenase activity, and Paul Karl Horan label-retaining cells, surface markers, nonenriched and enriched detection), reporter systems, and other analytical methods (flow cytometry, fluorescence microscopy/spectroscopy, etc.). The detailed information on methods to detect CSC, CTC, and EPC in this review will assist investigators in successful prognosis, diagnosis, and cancer treatment with greater ease.

Figures



KEY WORDS: detection, cancer stem cells, circulating tumor cells, endothelial progenitor cells, diagnosis

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