Pengaruh Suplemen Insulin-Tranferrin-Selenium (ITS) dalam Medium Bebas Serum terhadap Kultur Circulating Tumor Cell (CTC) Kanker Kolorektal = The Effects of Insulin-Transferrin-Selenium (ITS) Supplement in Serum-Free Media on Colorectal Cancer Circulating Tumor Cells (CTCs)

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Abstrak

Circulating tumor cell (CTC) merupakan intermediet proses metastasis kanker yang dapat dimanfaatkan untuk diagnosis, prognosis, dan target pengobatan kanker. Pengembangan pemanfaatan CTC dapat dilakukan dengan penelitian yang umumnya melibatkan proses kultur. Medium bebas serum dinilai lebih baik dibanding medium berserum karena dapat menghasilkan data yang lebih konsisten, sehingga lebih cocok digunakan untuk penelitian yang mengkaji aktivitas fisiologi sel dan persinyalan molekular. Namun, medium bebas serum memerlukan suplemen agar sel dapat tumbuh optimum. Penambahan suplemen insulin-transferrin-selenium (ITS) telah diketahui memiliki peran penting dalam kultur sel keratosit, ovarium, dan keratinosit. Namun, belum diketahui peran ITS dalam medium bebas serum untuk kultur CTC. Penelitian ini mengkaji perbedaan efek FBS dan ITS dengan konsentrasi 1X dan 10X dalam medium bebas serum terhadap CTC yang diisolasi dengan metode eritrolisis. Kultur dilakukan selama 18 hari. Dinamika CTC dan leukosit diamati dengan meninjau viabilitasnya pada 6 hari pertama kutur. Selain itu, observasi morfologi dilakukan seiring dengan pengukuran morfometri sel. Pada hari ke-18, keberadaan CTC diverifikasi dengan imunofluoresens menggunakan marka cytokeratin 20 (CK20) dan plastin 3 (PLS3). Hasil penelitian menunjukkan bahwa CTC yang dikultur pada medium dengan penambahan 10X ITS memiliki diameter sel yang lebih besar dari yang dikultur pada medium dengan penambahan 1X ITS dan 10% FBS. Hal tersebut menunjukkan bahwa ITS memiliki peran penting dalam kultur CTC dalam medium bebas serum dan dalam konsentrasi 10X dapat meningkatkan pertumbuhan CTC kanker kolorektal.
.....Circulating tumor cells (CTCs) are intermediates in the cancer metastasis process and hold potential for use in cancer diagnosis, prognosis, and treatment targeting. The development of CTC applications typically involves research incorporating cell culture processes. In cell culture, serum-free media are considered superior to serum-containing media as they yield more consistent data, making them more suitable for studies examining cell physiological activity and molecular signaling. However, serum-free media require supplementation to ensure optimal cell growth. The addition of insulin-transferrin-selenium (ITS) supplements is known to play a crucial role in the culture of keratocytes, ovarian cells, and keratinocytes. However, the role of ITS in serum-free media for CTC culture remains unknown. This study investigates the differential effects of fetal bovine serum (FBS) and ITS at concentrations of 1X and 10X in serum-free media on CTCs isolated via erythrolysis. Cultures were maintained for 18 days, with CTC and leukocyte dynamics observed by assessing cell viability during the first six days of culture. Additionally, morphological observations and cell morphometric measurements were conducted. On the 18th day, the presence of CTCs was verified using immunofluorescence with cytokeratin 20 (CK20) and plastin 3 (PLS3) markers. The results indicated that CTCs cultured in media supplemented with 10X ITS exhibited larger cell diameters compared to those cultured with 1X ITS and 10% FBS. This finding suggests that ITS

plays a critical role in the successful culture of CTCs in serum-free media and that a 10X concentration of ITS can enhance the growth of colorectal cancer CTCs.