Analyzing SOX2 gene expression level of putative human breast cancer stem cell fractions = Analisis tingkat ekspresi Gen SOX2 pada fraksi sel punca kanker payudara putatif

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Abstrak

[Latar Belakang: Kanker payudara masih merupakan kanker yang paling umum pada wanita. Identifikasi sel punca kanker payudara sangat penting dalam memberantas penyakit ini dari akarnya. Beberapa riset telah mengisolasi sel punca kanker payudara berdasarkan protein membran sel CD24/CD44 dan menemukan sel punca kanker payudara pada sel CD24-/CD44+ yang menunjukkan sifat pluripotensi. Namun, beberapa riset lainnya menemukan CD24-/CD44+ tidak ditemukan pada seluruh tipe kanker payudara, dan tidak selalu berhubungan dengan perkembangan tumor. Maka dari itu, tingkat pluripotensi dari sel tersebut masih diperdebatkan. Dalam riset ini, sifat pluripotensi sel punca kanker payudara dinilai berdasarkan ekspresi gen SOX2 yang merupakan gen untuk sifat kepuncaan dimana gen ini dapat mendorong pembelahan sel dan invasi.
Metode: Sampel diambil dari situs primer kanker payudara dan difraksinasi melalui pemisahan sel magnetik. RT-qPCR dan elektroforesis digunakan untuk mempelajari tingkat ekspresi gen SOX2 antara fraksi-fraksi sel punca kanker payudara.
Hasil: Kami berhasil memisahkan sel pluripoten dari spesimen klinis kanker payudara. Fraksi CD24-/CD44- menunjukkan ekspresi gen SOX2 yang lebih tinggi secara signifikan dibanding CD24-/CD44+. Setelah melewati proses ultralow attachment, CD24-/CD44+ menunjukkan peningkatan ekspresi gen SOX2 walaupun lebih rendah dari CD24-/CD44-.
Kesimpulan: Pluripotensi yang tinggi, berdasarkan tingkat ekspresi gen SOX2, ditemukan pada fraksi CD24-/CD44-. Tingkat pluripotensi fraksi CD24-/CD44+ lebih rendah dibandingkan fraksi CD24-/CD44-.;Background: Breast cancer remains as the most prevalent cancer in women.
Identification of breast cancer stem cell (CSC) is crucial in eradicating the disease from its root. Multiple research has isolated breast CSC based on CD24/CD44 surface marker and discovered that CD24+/CD44- fraction indicates stemness and pluripotent characteristics. However, it was also found that CD24+/CD44- breast CSC is not present in all breast cancer types, and not always associated with tumor progression. Therefore, its pluripotency level remains debatable. In this research, pluripotency of breast CSCs was assessed. Pluripotency was determined based on SOX2 gene expression, a gene responsible for stem-like properties, which can drive cellular proliferation and invasion.
Method: The samples were taken from primary site of breast cancer and

fractionated through magnetic cell sorting. RT-qPCR with subsequent electrophoresis was used to study the expression level of SOX2 gene among breast CSC fractions.
Results: We managed to separate the pluripotent cells from the bulk clinical specimen. CSC subset CD24-/CD44- showed a significantly higher SOX2 expression in comparison to CD24-/CD44+. Following ultra-low attachment, CD24-/CD44+ showed an increase in SOX2 expression level although still lower than CD24-/CD44-.
Conclusions: A high pluripotency based on SOX2 gene expression level was found in fraction CD24-/CD44-. The pluripotency level of fraction CD24-/CD44+ was lower in comparison to fraction CD24-/CD44-., Background: Breast cancer remains as the most prevalent cancer in women.
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