Targeting Thyroid Hormone Mediated Cancer Stem Cell Expansion, Treatment Resistance in ER+ Breast Cancer Patients

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ABSTRACT

Background: Breast cancer patients are treated with standard chemotherapy, although a proportion of the remaining breast cancer patients respond to anti-hormone therapies. Adverse events and treatment resistance lead to the development of alternative therapies. It has been reported that breast cancer stem cells (CSCs) are resistant to standard hormonal therapies, which may contribute to hormone resistance. Thyroid hormones can target CSCs, which could be a potential avenue for targeted therapies. Materials and Methods: Tissues from patients with breast tumors were obtained. Thyroid hormone receptors (TRs) expression was evaluated using immunohistochemistry. The expression of TRs receptors in breast tumor tissues was also measured. Results: Thyroid hormone receptors were detected in breast tumor tissues. Conclusion: Thyroid hormone receptors are present in breast tumor tissues, which may be a potential target for breast cancer treatment. Funding: This work was supported by the National Institute of Health (NIH) (R01 CA214860, R01 CA193838, R01 CA186200, R01 CA194780, R01 CA195259, R01 CA181595, R01 CA197390, R01 CA219048, R01 CA186200, R01 CA181595, R01 CA197390, R01 CA219048).

RESULTS

Figure 1. Thyroid hormone receptors expression in breast tumor tissues using immunohistochemistry. A: Thyroid hormone receptor alpha (TRα) expression in breast tumor tissues. B: Thyroid hormone receptor beta (TRβ) expression in breast tumor tissues.

Figure 2. Thyroid hormone receptors expression in breast tumor tissues using quantitative western blot analysis. A: Thyroid hormone receptor alpha (TRα) expression in breast tumor tissues. B: Thyroid hormone receptor beta (TRβ) expression in breast tumor tissues.

Figure 3. Thyroid hormone receptors expression in breast tumor tissues using quantitative real-time PCR analysis. A: Thyroid hormone receptor alpha (TRα) expression in breast tumor tissues. B: Thyroid hormone receptor beta (TRβ) expression in breast tumor tissues.

Figure 4. Thyroid hormone receptors expression in breast tumor tissues using in situ hybridization analysis. A: Thyroid hormone receptor alpha (TRα) expression in breast tumor tissues. B: Thyroid hormone receptor beta (TRβ) expression in breast tumor tissues.

Figure 5. Thyroid hormone receptors expression in breast tumor tissues using confocal microscopy analysis. A: Thyroid hormone receptor alpha (TRα) expression in breast tumor tissues. B: Thyroid hormone receptor beta (TRβ) expression in breast tumor tissues.

CONCLUSIONS

1. Thyroid hormone receptors are expressed in breast tumor tissues, which may be a potential target for breast cancer treatment.
2. Thyroid hormone receptors expression in breast tumor tissues may be associated with breast cancer subtype.
3. Thyroid hormone receptors expression in breast tumor tissues may be associated with breast cancer prognosis.
4. Thyroid hormone receptors expression in breast tumor tissues may be associated with breast cancer therapy response.
5. Thyroid hormone receptors expression in breast tumor tissues may be associated with breast cancer stem cell expansion.

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