

TAMOXIFEN SENSITIVITY ASSAY

What is Tamoxifen?

Tamoxifen is a drug that is typically prescribed for women with Estrogen Receptor Positive (ER+) breast cancer. ER+ breast cancers have estrogen receptors in the breast cancer cells. Tamoxifen works by locking on to the estrogen receptors to block estrogen from attaching to them. The estrogen cannot then stimulate the cells to divide and grow.

Tamoxifen has been in clinical use for the treatment of breast cancer since the 1970's and may reduce the risk of recurrence and death when given as adjuvant therapy for early stage disease. Tamoxifen has also been recommended for use in women who may be at high risk of developing breast cancer.

How could the Tamoxifen Sensitivity Assay benefit me?

Hormone-based treatment, such as tamoxifen, has turned out to be one of the mainstream treatments in estrogen receptor positive breast cancer, and brought about a great improvement in disease-free survival and overall survival.^[1] However, adjuvant hormone therapy does not work as intended for a considerable amount of breast cancer patients and thus, identification of markers for better selection of endocrine treatment is needed.^[1]

The *CYP19A1* gene plays a critical role in the synthesis of estrogen, and it is believed that genetic variants in the gene may be a useful marker in determining a patient's likely response to hormone-based therapies such as Tamoxifen.

The Tamoxifen Sensitivity Assay has been specifically designed for breast cancer patients, or women with an increased risk of breast cancer, and detects the *CYP19A1* gene. The assay specifically looks for a single nucleotide polymorphism in the *CYP19A1* gene – SNP rs4646 – to determine your genotype. There is growing evidence to suggest that based on your genotype, you may have an increased or decreased response to Tamoxifen treatment.^[2]

For patients considering treatment with Tamoxifen, the Tamoxifen Sensitivity Assay can be used to determine your *CYP19A1* genotype. This in turn can help you and your health care provider determine if Tamoxifen is suitable for you, and if adjustments to dosages are required.

How do I organise Testing?



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References

1. Shao, X., Cai, J., Zheng, Y., Wang, J., Feng, J., Huang, Y., Shi, L., Chen, Z., Guo, Y., & Wang, X. (2015). S4646 polymorphism in CYP19A1 gene is associated with the efficacy of hormone therapy in early breast cancer. *International journal of clinical and experimental pathology*, 8(5), 5309–5317.
2. Shao, X., Y. Guo, et al. (2015). "The CYP19 RS4646 polymorphism IS related to the prognosis of stage I-II and operable stage III breast cancer." *PLoS One* 10(3): e0121535.