How the genetics of estrogen metabolism can affect your patient's risk for breast cancer.

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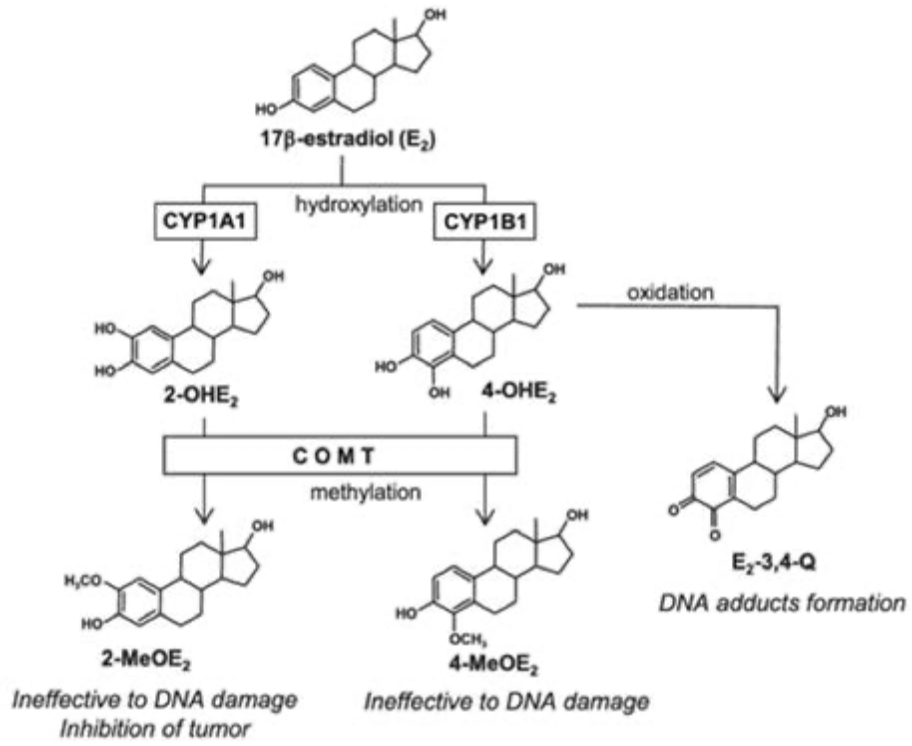
One of the most important goals of hormone balancing is to decrease the patient's risk of breast cancer. As the body of genetic research grows, there is a corresponding increase in understanding of the role a person's genotype plays in their risk for developing this serious disease. It has been known for years that estrogen levels may affect a person's risk for certain forms of breast cancer. One of the main focuses of genetic research is how genes affect the risk of developing estrogen sensitive breast cancer.

Research into the genes affecting estrogen metabolization reveals that certain metabolites can either protect or promote cancer causing activities such as cell growth.1 When the body seeks to eliminate estradiol it uses three main enzymes; CYP1A1, CYP1B1 and COMT.[1]



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Estradiol is first converted into two metabolites called 2-MeOE$_2$ and 4-MeOE$_2$ by the enzymes CYP1A1 and CYP1B1 respectively. If the process is impeded at this phase

there are increased levels of these two intermediates that have been shown to promote breast cancer.[1,2] The next step of this important metabolic process is the conversion of these dangerous metabolites to cancer protective products called 2-$MeOE_2$, and 4-$MeOE_2$.[3] This step is carried out by the COMT enzyme.

Issues arise when a patient has a fast CYP1A1 and/or CYP1B1 enzyme(s) and a slow COMT enzyme. A fast CYP1A1 and/or CYP1B1 in combination with a slow COMT can cause a buildup or 2-OHE_2 and 4-OHE_2 - the breast cancer promoting metabolites. This can increase risk of breast cancer especially when combined with low progesterone and environmental factors such as increased exposure to xenoestrogens and stress.[1]

Genetic testing offers practitioners the ability to identify patients with genotypes that can increase risk for breast cancer. Practitioners can specifically order genetic tests that will identify alleles that cause fast or slow versions of the enzymes CYP1A1, CYP1B1 and COMT. A practitioner may suspect the presence of a fast CYP1A1 and/or CYP1B1 if there are low estradiol levels on a salivary hormone test. However, if using urine hormone testing and the patient has a fast CYP1A1 combined with a slow COMT there may be low estradiol levels combined with high 2-OH E_2. Similarly, a practitioner may suspect a fast CYP1B1 with a slow COMT if there are low estradiol levels combined with high 4-OH E_2. Knowing a patient's genotype can help to understand hormone levels and create treatments based on the patient's unique biochemistry.

Estrogen is an important hormone for both women and men and, when it is in balance with all other hormones, it is vital to health. Estrogen in women is important for:

- Sexual development during puberty
- Uterine growth during the menstrual cycle
- Reducing bone resorption and increases bone formation
- Increasing binding proteins, platelet adhesiveness and coagulation proteins in the liver
- Positively impacting HDL/LDL ratios
- Affecting collagen quality and quantity
- Supporting memory function
- Stimulating cell to proliferate

It's estrogen's last function on this list that is central to its role in the development of breast cancer. Estrogen exists in multiple forms; estrone (E1), estradiol (E2), and estriol (E3), estradiol is the most potent and prevalent of these.

Balancing estrogen with progesterone is an important goal for practitioners and the relationship between the two is known as the estrogen/progesterone ratio. If estrogen levels are elevated in comparison to progesterone - estrogen dominance is likely which can be a risk factor for breast cancer.[4]

Bioidentical progesterone is a key component of any holistic treatment protocol that seeks to reduce the risk of breast cancer. Kajarin's 2Restore and 4Balance progesterone creams are designed to help balance a patient's progesterone to estrogen ratio.

Treatment Considerations
In addition to 2Restore or 4Balance, other considerations to improve breast health and optimize patient's genetics include:

- A patient with slow COMT enzyme function can be supported with supplementation of B6 and magnesium.
- Resveratrol has been found in preliminary research to decrease the enzyme activity of both CYP1A1 and CYP1B1.[5,6]

Balancing hormones is integral to increasing a patient's breast health. Knowing a patient's genotype can now help the practitioner to prevent disease before it begins. Research is showing that genetics can influence estrogen levels by controlling how quickly estradiol is broken down. If the genotype of a patient is known, then CYP1A1, CYP1B1 and COMT enzyme function can be balanced. Bioidentical progesterone makes it easier to maintain a healthy balance of sex hormones by optimizing the estrogen to progesterone ratio. Genetics and breast cancer risk is a growing area of research and as our knowledge increases so do options for prevention.

References

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