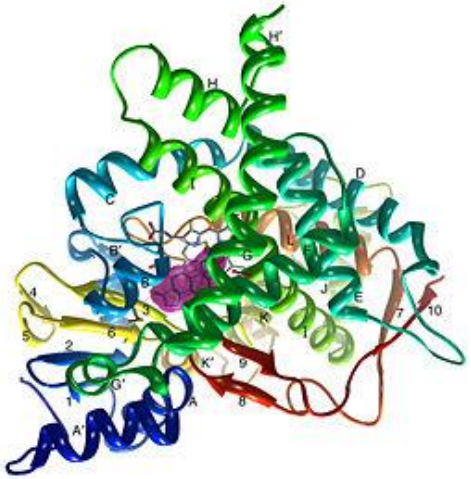
Aromatase

Healthy
Hormones

Aromatase

- Aromatase is an enzyme that coverts testosterone to estrogen
- It can be found in the gonads, brain, fat cells, placenta, blood vessels, skin, and bone, as well as in tissue of endometriosis, uterine fibroids, breast cancer, and endometrial cancer
- Highest concentration is in the adrenals but the potential for the conversion to estrogen is throughout the body
- Circulating inflammatory cytokines increase the activity of aromatase and therefore estrogen – this is in men and women (before, during and after menopause)



Aromatase Inhibitors

- Refers to drugs or specific elements in food
- Aromatase-inhibitors interfere with the body's ability to produce estrogen from androgens
- They do this by suppressing aromatase enzyme activity
- Drugs create for this purpose are prescribed to women and men who have estrogen hormone-related cancers, usually menopausal women
- There have been three generations of drug so far as researchers try to limit reactions

Tamoxifen

- A drug that has been in use the longest and blocks the actions of estrogen (not production)
- If taken for 5 years it reduces the risk of recurrence by 40% and death by 34%
- 1/3 of all women taking it do have a recurrence
- Women who had a metastasis with original cancer will all relapse despite tamoxifen
- Side effects include increased risk of blood clots, stroke and heart disease, liver problems, breast lumps, blurred vision, vomiting, unusual vaginal bleeding and discharge, increase risk of ovarian cancer, hot flashes

Aromatase-Inhibiting Drugs

- Anastrozole, Exemestane, and Letrozole:
- Side Effects: Hot flashes, joint pain, vaginal dryness, painful intercourse, bone loss, high cholesterol
- More effective than tamoxifen
- Anastrozole was effective at shrinking some tumours in menopausal women to allow them a surgical option
- A study of 9000 women of AI's combined with Tamoxifen or alone – depending on the type of breast cancer AIs were as effective as tamoxifen or better in some cases by themselves

Natural AIs

- The problem with drugs is the side effects and long-term damage to the body
- Could natural alternatives alone be the answer?
- The problem is that a study will not be done – it is considered unethical to deprive a person of a known treatment as part of a test
- There are women who opt for natural alternative over drugs do so by choice
- It is not something we can advocate
- Studies on natural AIs are in vitro and/or on animals

Modulation of Aromatase Activity by Diet Polyphenolic Compounds

Abstract: Estrogens are involved in physiological actions related to reproduction, body fat distribution, and maintenance of bone mass and are also related to the pathogenesis of estrogen-dependent cancers. The aim of this work was to study the effect of polyphenols on estrogen synthesis. Some of the tested polyphenols inhibited estrogen production, chrysin being the most potent.

Additionally, we observed that red wine, alcohol-free red wine, green tea, and black tea (200 microL/mL) significantly decreased aromatase activity. No effect on aromatase expression, has been detected after 24 h of treatment with any of the flavonoids under study. **In conclusion, polyphenols are able to modulate aromatase activity and, consequently, estrogen synthesis. The knowledge of such interference may help to clarify some of the biological properties attributed to polyphenols and may be useful in prevention/treatment of estrogen-dependent disorders.**

Flavonoid inhibition of aromatase enzyme activity in human preadipocytes

Eleven flavonoid compounds were compared with aminoglutethimide (AG), a pharmaceutical aromatase inhibitor, for their abilities to inhibit aromatase enzyme activity in a human preadipocyte cell culture system. Flavonoids exerting no effect on aromatase activity were catechin, daidzein, equol, genistein, β-naphthoflavone (BNF), quercetin and rutin. The synthetic flavonoid, α-naphthoflavone (ANF), was the most potent aromatase inhibitor, with an I50 value of 0.5 µM. Three naturally- occurring flavonoids, chrysin, flavone, and genistein 4'-methyl ether(Biochanin A) showed I50 values of 4.6, 68, and 113 µM, respectively, while AG showed an I50 value of 7.4 µM.

Chrysin, the most potent of the naturally-occurring flavonoids, was similar in potency and effectiveness to AG, a pharmaceutical aromatase inhibitor used clinically in cases of estrogen-dependent carcinoma.

This data suggest that flavonoid inhibition of peripheral aromatase activity may contribute to the observed cancer-preventive hormonal effects of plant-based diets

Study

Effect of soy isoflavones on breast cancer recurrence and death for patients receiving adjuvant endocrine therapy - Xinmei Kang et al 2010

524 women who had had breast cancer

Results: High dietary intake of soy isoflavones was associated with lower risk of recurrence among post-menopausal women with breast cancer positive for estrogen and progesterone receptors and those who were receiving anastrozole (aromatase inhibitor) as endocrine therapy

Supporting A Client On AIs

- Some doctors will warn client away from phytoestrogens
- Look at the list of side effects and try to count them naturally
- Supporting all the players will be helpful
- Phytoestrogens such as flax would be helpful
- Maca and milk thistle would helpful
- Plus blood sugar support, adrenal support and probiotics

Two AI Supplements

- Damiana: A well known plant – aphrodisiac, supports nervous system, helps with headaches, depression and lowers blood sugar
- A study showed that damiana extract could significantly suppress aromatase activity
- Myomin: Combination ingredients such as white turmeric and cyperus rotundus (also known as java grass), sarsparilla, Aralia dasyphyllia - produced by one company
- One study in animals showed that myomin significantly reduced the population of aromatasein the liver in 30 days

AI Foods

- Chrysin – honey, propolis and passion flower
- Quercetin – Apples, peppers, red wine, dark cherries and berries (blueberries, bilberries, blackberries and others) tomatoes, cruciferous vegetables, including broccoli, cabbage and sprouts, leafy green veggies, including spinach, kale, citrus fruits, apricots, apples
- Naringenin – Grapefruit and other citrus fruits

AI Foods

Resveratrol: Grapes, wine, peanuts, pistachios, cranberries, blackberries, blueberries – even chocolate and cocoa has a little

Apigenin: Parsley, celery, rosemary, oregano, thyme, basil and coriander, chamomile, cloves, lemon balm, artichokes, spinach, peppermint, red wine, licorice

Genistein: Soy and other legumes, some fruits and nuts have small amount with raisins and currents being the highest (still low compare to soy)

Oleuropein: Olives, olive oil

AI Foods

- Other aromatase-inhibitors foods including beer, green tea, coffee, black tea, mushrooms, oysters, flax, mangosteen
- Chrysin considered one of the most effective, found in honey and propolis
- Studies only study the chemical in the food, not the food
- Several foods have more than one type
- A whole food diet could contain a number of these foods

AI Foods

- Over 300 foods have been tested for aromatase inhibiting activity
- The levels of activity vary
- The potential of a diet with a number of them consumed daily offers a lot of potential
- Whole foods have other anti-cancer compounds or immune support or liver support (salvestrols)
- A man or woman consuming these foods in conjunction with the drug will see more benefit

Cancer

- Cancer protocols are difficult – even after remission
- Aromatase-inhibiting foods are an important part but not the only part
- But will all the foods and strategies discussed, the body is receiving so much to fight with
- Along with lifestyle suggestions and psycho-spiritual considerations, there is a lot we can offer clients