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Prostate Cancer

CASE STUDY using HuMAP

www.regeneruslabs.com

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KATE GARDEN
HEALTH

OMNOS™ regenerus labs

ABOUT KATE

Experienced Nutritional Therapist (2003)

IFM Certified Practitioner (2018)

Online Nutrition Clinics

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Mentorship "Practice like a Pro' for NT's & GP's

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KATE GARDEN
HEALTH

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LEARNING OBJECTIVES

- How to evaluate and assess of key male hormones and their metabolites using Hormone and Urinary Metabolites Assessment Profile HUMAP
- How to assess parent hormones and their metabolites to reveal how the body is breaking down and detoxifying key hormones
- To understand how a Functional Medicine approach, with a nutritional and lifestyle plan, can support a case of prostate cancer

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Why use
Urinary Hormone Testing?

01

Comprehensive Overview

- Assessment of steroid hormones & their metabolites
- Assessment of efficiency of key enzymes

02

Unique Viewpoint for practitioner

- Hormone bioavailability and utilization
- Metabolic pathways that can highlight risk factors for hormone dependent cancers

03

Ease of specimen collection

- Non- invasive
- Test can be performed at home

04

Timing

- Ability to measure 4 time points
  - Dinnertime
  - Bedtime
  - Waking
  - 2 hrs Post Waking
  - 5th tube for any optional middle of night specimen

Why use **HuMAP?**

01

Presentation

- Super clear
- Easy to understand

02

Comprehensive metabolites

- Hormone metabolite ratios can help assess risk of breast/prostate cancer

03

Easy to add on other panels

- NeuroBasic Profile
- Comprehensive Neurotransmitter Profile

04

Smaller Profile Options

- Oestrogen Metabolites Profile
- Sex Hormone Profile
- Androgens & Progesterone Profile
- Adrenal Corticoids Profile

HuMAP: Summary page

Identifies clearly

- The most clinically actional information
- Key findings of the oestrogens
- Key findings of the corticoids
- Key relationships of enzyme activity
  - 5a reductase
  - Aromatase
  - COMT/Methylation

Case Study: DAVID

60-year-old single male. Musician, travels, shift work, often night sets. Can sleep in day and has trouble falling asleep.

Main Aim - health MOT, help in loosing weight, interested in functional medicine/nutrition, wants more energy.

Diet

- Breakfast - often skips breakfast or just has fruit and organic fruit yoghurt
- Lunch - sausage rolls, pies, mackerel fillets in wraps Snacks – 5 biscuits or crips
- Dinner - meat and or vegetable curries, stir-fries, sausages with onions and roast potatoes
- Drinks - kombucha, bottled water, alcohol when at work and socializing (varies 0- 30 units weekly)

Exercise

- Quite sedentary lifestyle, occasional swimming, walking.

Weight = 17.5 stone Height 5ft 10 inches. **BMI** = 35 **Waist/hip ratio**: high with central obesity

Main Symptoms

- ENERGETIC - Tiredness, lethargy, poor sleep
- COGNITIVE - Depression, ADHD type symptoms
- HORMONAL / CARDIOVASCULAR - Erectile dysfunction, low libido, poor urine flow, some sporadic pain in the testicle and prostate area

Blood Test Results: DAVID

BIOCHEMISTRY

Homocysteine	*** 20.72**	**umol/L**	**5.5 - 16.2**
	Elevated values may occur if correct sample collection procedures are not followed. An EDTA or a SERUM sample separated within 1 hour is recommended.		
LDH	223	IU/L	135 - 225

- Hcy 20.72 (umol/L 5.5-16.2)
- MCHC 353 (g/L 300-350)

HAEMATOLOGY

HAEMOGLOBIN (g/L)	151	g/L	130 - 170
HCT	0.428		0.37 - 0.50
RED CELL COUNT	4.67	x10^12/L	4.40 - 5.80
MCV	91.6	fL	80 - 99
MCH	32.3	pg	27.0 - 33.5
MCHC (g/L)	*** 353**	**g/L**	**300 - 350**
RDW	12.4		11.5 - 15.0
PLATELET COUNT	285	x10^9/L	150 - 400
MPV	9.7	fL	7 - 13
WHITE CELL COUNT	6.75	x10^9/L	3.0 - 10.0
Neutrophils	55.9% 3.77	x10^9/L	2.0 - 7.5
Lymphocytes	29.5% 1.99	x10^9/L	1.2 - 3.65
Monocytes	11.3% 0.76	x10^9/L	0.2 - 1.0
Eosinophils	2.4% 0.16	x10^9/L	0.0 - 0.4
Basophils	0.9% 0.06	x10^9/L	0.0 - 0.1
ESR	2	mm/hr	1 - 20
	Note ref range raised in patients over 40		

BIOCHEMISTRY

Active B12	32	pmol/L	25.1 - 165.0
SODIUM	139	mmol/L	135 - 145
POTASSIUM	4.1	mmol/L	3.5 - 5.1
CHLORIDE	103	mmol/L	98 - 107
BICARBONATE	23	mmol/l	22 - 29
UREA	4.4	mmol/L	1.7 - 8.3
CREATININE	83	umol/L	66 - 112
eGFR (CKD-EPI)	89	.	
	Adjusting eGFR for ethnicity is no longer advised as per NICE CKD guidlines.		
	Note: eGFR calc changed to CKD-EPI e/f 28.11.22		
BILIRUBIN	15	umol/L	0 - 20
ALKALINE PHOSPHATASE	74	IU/L	40 - 129
ASPARTATE TRANSFERASE	23	IU/L	0 - 37
ALANINE TRANSFERASE	29	IU/L	10 - 50
LDH	216	IU/L	135 - 225
CK	124	IU/L	38 - 204
GAMMA GT	34	IU/L	10 - 71
TOTAL PROTEIN	65	g/L	63 - 83
ALBUMIN	44	g/L	34 - 50
GLOBULIN	21	g/L	19 - 35
CALCIUM	2.27	mmol/L	2.20 - 2.60
Corrected Calcium	2.30	mmol/L	2.20 - 2.60
PHOSPHATE	0.90	mmol/L	0.87 - 1.45
URIC ACID	341	umol/L	266 - 474
FASTING BLOOD GLUCOSE	5.4	mmol/L	3.9 - 5.8
FASTING TRIGLYCERIDES	0.9	mmol/L	< 2.3
FASTING CHOLESTEROL	4.8	mmol/L	Optimum <5.0
HDL CHOLESTEROL	1.3	mmol/L	0.9 - 1.5
HDL % of total	27	%	20 and over

LDL CHOLESTEROL	*** 3.1**	**mmol/L**	**Up to 3.0**
Non-HDL Cholesterol	3.5	mmol/L	< 3.8
IRON	21.4	umol/L	10.6 - 28.3
T.I.B.C	64	umol/L	41 - 77
TRANSFERRIN SATURATION	33	%	20 - 55
FERRITIN	100	ug/L	30 - 400
C Reactive protein	4.3	mg/L	<5.0
CRP - High sensitivity	4.3	mg/l	0.0 - 5.0
Haemoglobin A1c	*** 7.0**	**%**	**4.0 - 6.0**
HbA1c (mmol/mol)	*** 53**	**mmol/mol**	**20 - 41**
QFIT Comment	No Specimen received		
Red cell folate	*** 315**	**nmol/L**	**340 - 1474.7**
	<340 nmol/L is associated with folate deficiency.		
ENDOCRINOLOGY			
Prostate Specific Ag(Total)	*** 6.01**	**ug/l**	**0.00 - 2.99**
	Agreed age-related thresholds in the United Kingdom for referral for specialist evaluation for prostate cancer (age 50 - 69 years as formally advocated by NICE) are: 40 - 49 years: >/= 2.5 50 - 69 years: >/= 3 >/= 70 years: >/= 5 Please note new reference range from 29/09/2021		
Prostate Specific Ag(Free)	0.74	ug/l	0 - 0.90
Free:Total ratio	0.12 >0.24 is normal		
THYROID STIMULATING HORMONE	2.30	mIU/L	0.27 - 4.2
FREE THYROXINE	20.1	pmol/l	12.0 - 22.0
25 OH Vitamin D	*** 40**	**nmol/L**	**50 - 200**
	Interpretation of results: Deficient <25 nmol/L Insufficient 25 - 49 nmol/L Normal Range 50 - 200 nmol/L Consider reducing dose >200 nmol/L		

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Blood Test Results: DAVID

LDL Cholesterol	3.10	(nmol/L Up to 3)
HbA1c	53	(nmol/mol 20 - 41)
PSA	6.01	(ug/L 0 - 2.99)
25 –OH Vitamin D.	40	(nmol/L 50 – 200)
Red cell folate	315	(nmol/L 340 - 1474)

Initial Plan : DAVID

IFM Cardiometabolic Diet

- With a focus on blood sugar balance
- Importance of timing of meals
- Protein in the morning
- Last meal before 8pm
- Healthier, protein-based snacks

Sleep Hygiene

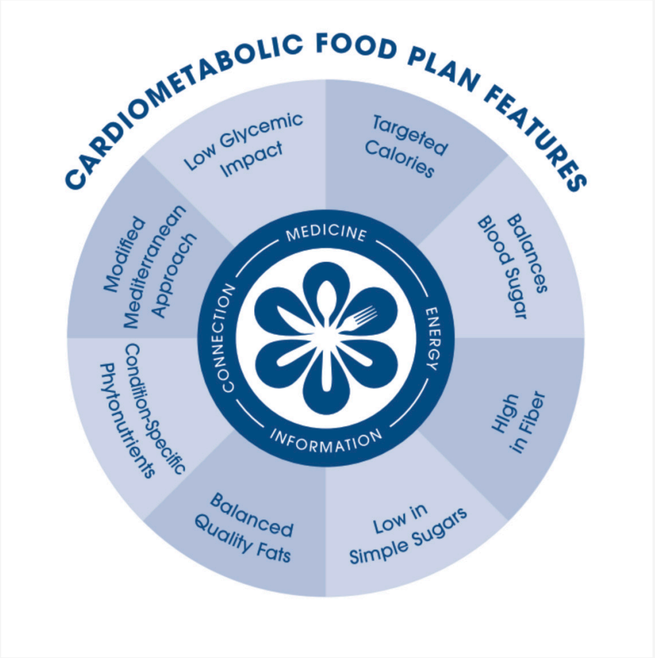
Exercise

- Paced walking every day at least 40 minutes

Supplements

- Vitamin D with K2
- Multi-vitamin
- Glucose Optimizer

Referred to GP re HbA1c and prostate antigen elevations



Referred to GP: DAVID

Dear Dr. **********,

Re: DAVID **** DOB **/**/63**

I saw Mr. David ******* for a nutrition consultation recently and ran some blood and urine tests to check his immunity, nutrient levels and general metabolism.

I wanted to highlight some anomalies, listed below, and have attached the blood work and microbiology for your reference. Mr. David ********reported a pain in the prostate area on waking and also occasional pains in his feet, so I refer him to your good self for any further assessment.

Haemoglobin A1c 7.0 % (ref range 4.0 - 6.0)
HbA1c (mmol/mol) 53 (ref range 20-41)
Prostate Specific Ag (Total) 6.01 (ref range 0.00-2.99)
Vitamin D - 25OH 40 nmol/L (ref range 50-200)

I would also like to let you know that I have advised him on a reduced sugar, low carbohydrate and cardio protective eating plan and lifestyle practices (including exercise, meal timing and sleep hygiene) to reduce his HbA1c levels and support his general cardiovascular health.

I also suggested a Vitamin D, multi-vitamin and blood sugar supportive supplement to ******** to address the issues and deficiencies observed.

Please do feel free to contact me, should you need any clarification on the above request or information.

Best wishes,

3 months later: DAVID

David's GP has confirmed his diabetes with his own set of bloods

- David is waiting to be referred to a NHS Dietician for management
- David has been referred for prostate cancer investigations

Meanwhile David is sticking robustly sticking to the plan

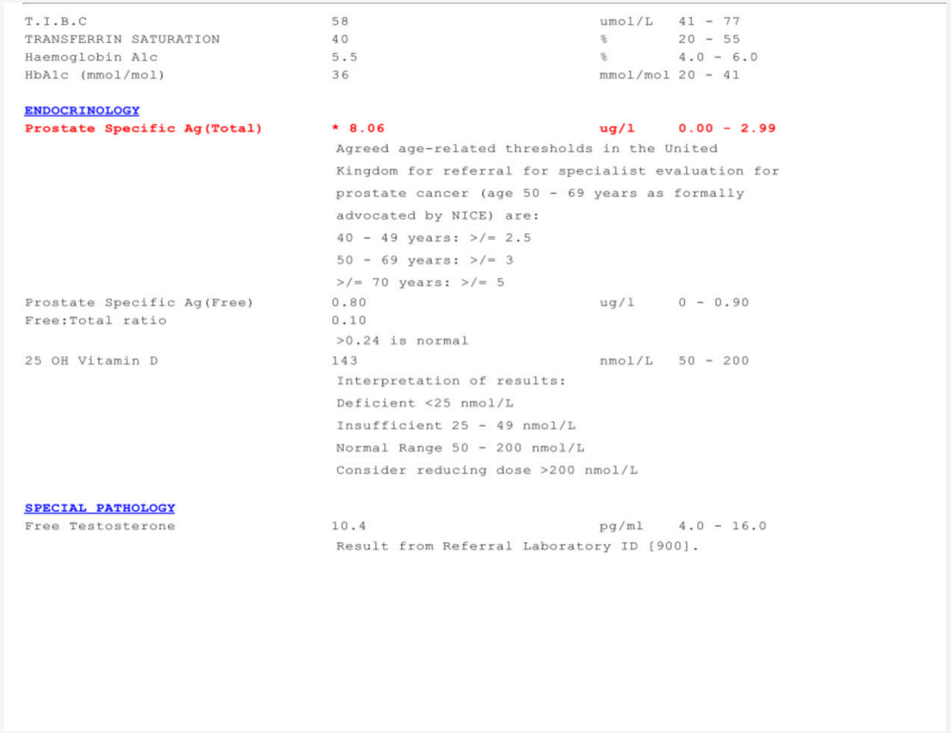
- CM Plan and supplements
- Walking 40 minutes every day
- Reduced alcohol significantly
- HbAlc has already reduced to 46 from 53
- Has lost 1 stone
- Feeling more energetic /better

We decided to run HuMAP whilst he was investigated being for prostate cancer

4 months later: DAVID

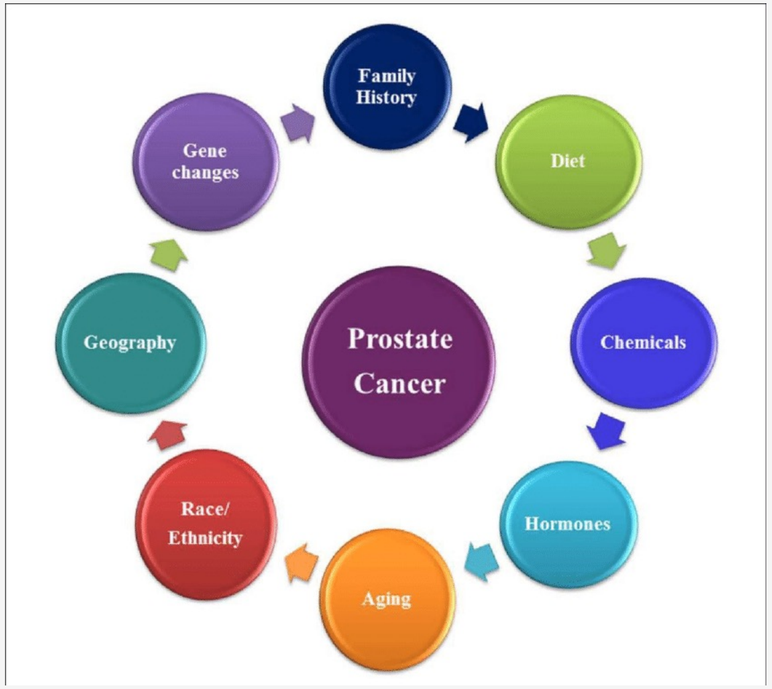
Whilst waiting for HuMAP

HbA1c	36	(nmol/mol 20 - 41)
PSA	8.06	(ug/L 0 - 2.99)
25 –OH Vitamin D.	143	(nmol/L 50 – 200)



T.I.B.C	58	umol/L	41 - 77
TRANSFERRIN SATURATION	40	%	20 - 55
Haemoglobin A1c	5.5	%	4.0 - 6.0
HbA1c (mmol/mol)	36	mmol/mol	20 - 41
ENDOCRINOLOGY			
Prostate Specific Ag(Total)	*** 8.06**	**ug/l**	**0.00 - 2.99**
	Agreed age-related thresholds in the United Kingdom for referral for specialist evaluation for prostate cancer (age 50 - 69 years as formally advocated by NICE) are: 40 - 49 years: >/= 2.5 50 - 69 years: >/= 3 >/= 70 years: >/= 5		
Prostate Specific Ag(Free)	0.80	ug/l	0 - 0.90
Free:Total ratio	0.10 >0.24 is normal		
25 OH Vitamin D	143	nmol/L	50 - 200
	Interpretation of results: Deficient <25 nmol/L Insufficient 25 - 49 nmol/L Normal Range 50 - 200 nmol/L Consider reducing dose >200 nmol/L		
SPECIAL PATHOLOGY			
Free Testosterone	10.4	pg/ml	4.0 - 16.0
	Result from Referral Laboratory ID [900].		

Prostate Cancer: RISKS



Risk Factors for Prostate Cancer

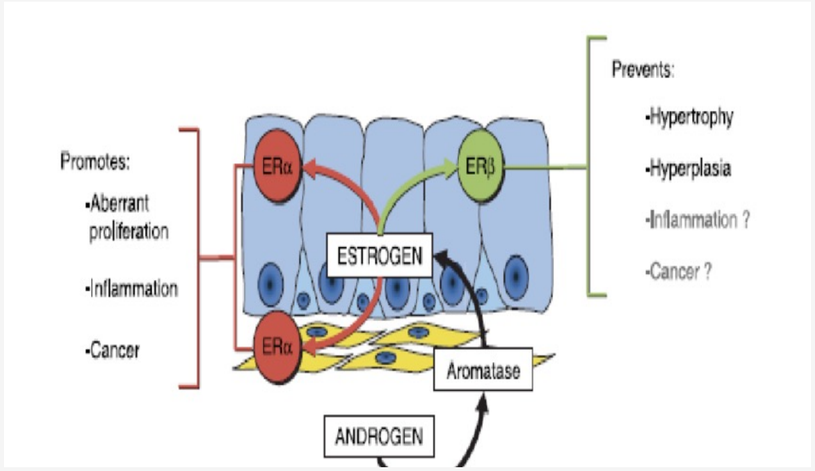
Elancheran Ramakrishnan et al, Urology Research & Therapeutics Journal 2017

'Strategy towards Diagnosis and Treatment for Prostate Cancer'
https://www.researchgate.net/publication/321756981

Prostate cancer is the most common cancer & the second most common cause of cancer-related death in men

RL Siegel et al. 2021
Cancer Statistics, Cancer J Clin
https://doi.org/10.3322/caac.21654

Hormones & the prostate



Prostate cells are influenced by hormones including testosterone, DHT, oestrogen and progesterone.

- Oestrogens within circulation can either be endogenous or exogenous
- Oestrogen can be produced from testosterone through the activity of aromatase enzyme
- Oestrogen is proliferative hormone, promoting cell growth

Aromatase up-regulation, insulin and raised intracellular oestrogens in men, induce adiposity, metabolic syndrome and prostate disease, via aberrant ER-α and GPER signalling. Mol Cell Endocrinol. 2012 Jan 5. Williams G.

HuMAP: DAVID

Key relationships

KEY ENZYMES

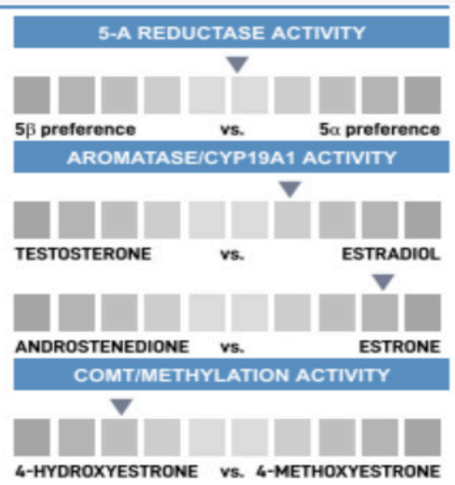
KEY RELATIONSHIPS

The graphs to the right represent metabolism preference by key enzymes, indicated by the arrow.

Metabolites in the 5-alpha pathway are more androgenic than their 5-beta counterparts and can be responsible for androgenic symptoms even when hormone levels appear normal.

Aromatase is an enzyme found in the greatest amounts in peripheral fat tissue which can increase estrogens in both males and females.

4-OH-E1 is considered unfavorable due to its carcinogenic potential within breast and prostatic tissue as a reactive metabolite. When methylated by COMT, this reactive metabolite becomes stable and can be removed from the body.



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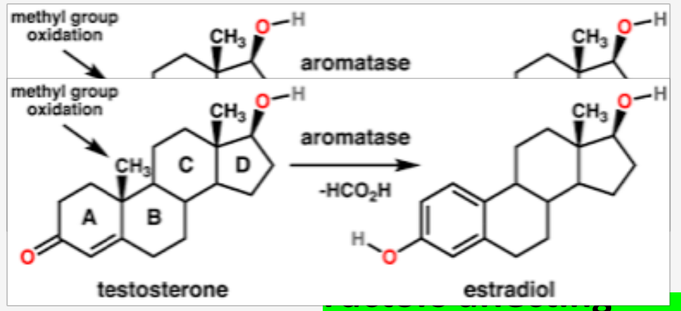


Aromatase CYP19A1

Alcohol : https://pubmed.ncbi.nlm.nih.gov/11163119/

Brain Injury :https://www.sciencedirect.com/science/article/abs/pii/S0306452298003406

Cortisol **:**https://pubmed.ncbi.nlm.nih.gov/22315456/

Diet -high glycemic foods **:**https://pubmed.ncbi.nlm.nih.gov/22233684/

Endocrine Disruptors /Xeno-oestrogens :https://pubmed.ncbi.nlm.nih.gov/28578073/

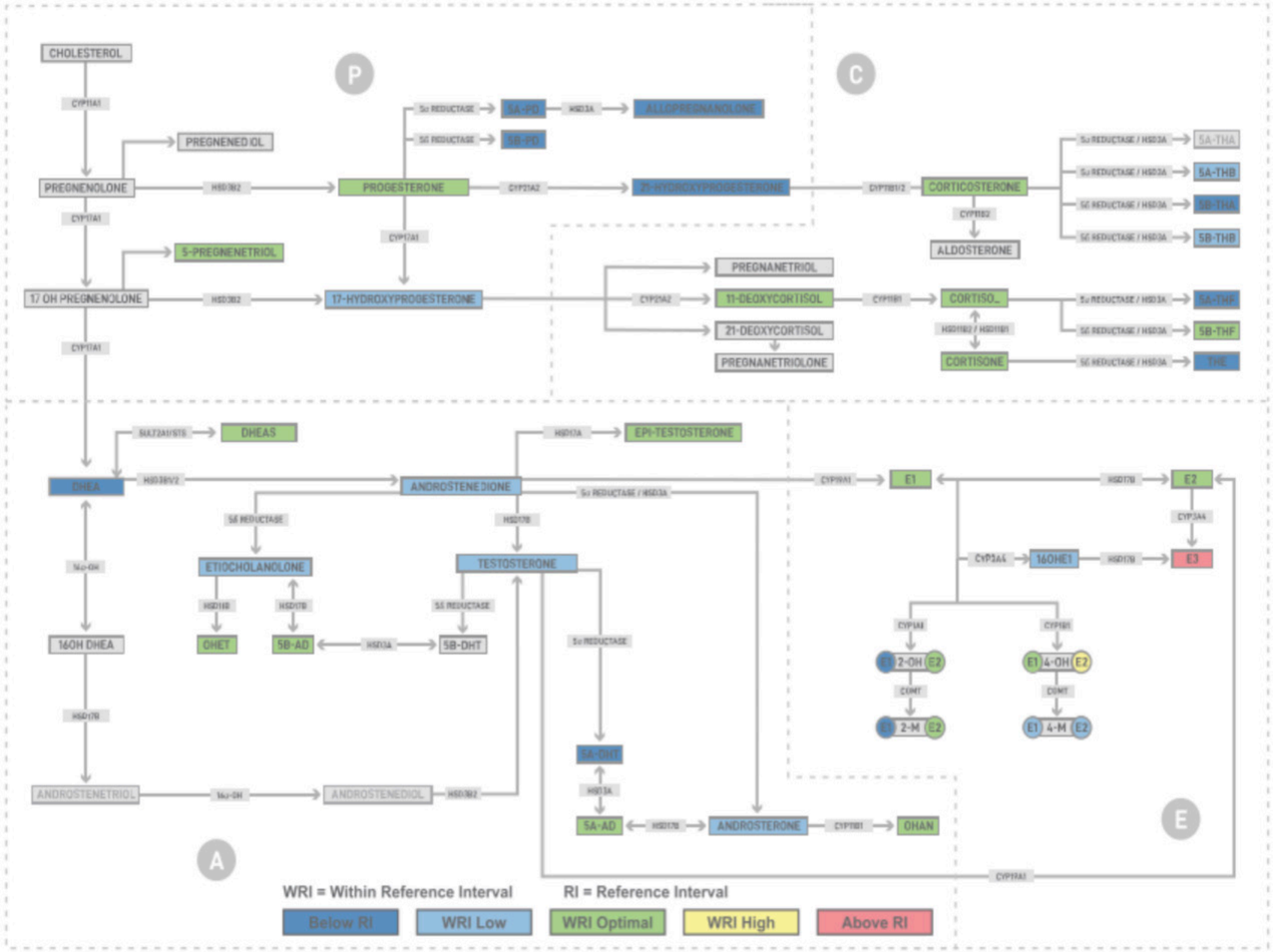
Forskolin (found in coleus plant) :https://pubmed.ncbi.nlm.nih.gov/14709151

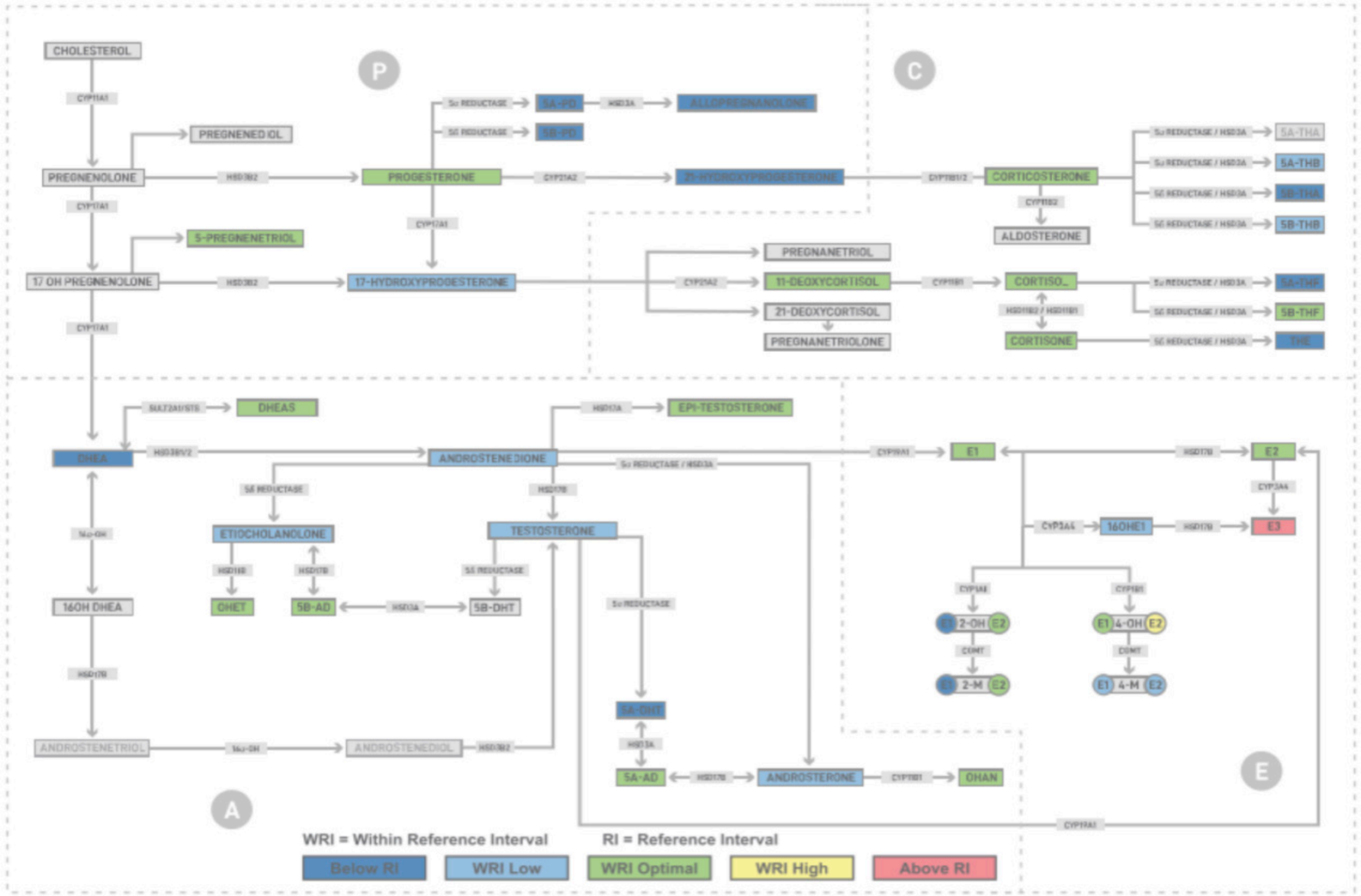
Greater adipose tissue/Leptin resistance/ Obesity :https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7938647/

High insulin: https://pubmed.ncbi.nlm.nih.gov/22233684/

Inflammatory cytokines: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC138722/

HuMAP: Overview




CHOLESTEROL
P
C
PREGNENED IOL
PREGNENOLONE
PROGESTERONE
5A-PD
5B-PD
ALLOPREGNANOLONE
17-HYDROXYPROGESTERONE
5-PREGNENETRIOL
17 OH PREGNENOLONE
PREGNANETRIOL
11-DEOXYCORTISOL
21-DEOXYCORTISOL
PREGNANETRIOLONE
CORTICOSTERONE
ALDOSTERONE
CORTISO_
CORTISONE
5A-THA
5A-THB
5B-THA
5B-THB
5A-THF
5B-THF
THE
DHEAS
DHEA
ANDROSTENEDIONE
EPI-TESTOSTERONE
E1
E2
E3
16OHE1
2-OH
2-M
4-OH
4-M
ETIOCHOLANOLONE
TESTOSTERONE
ANDROGENE
5B-AD
5B-DHT
16OH DHEA
5A-DHT
5A-AD
ANDROSTERONE
DHAN
ANDROSTENETRIOL
ANDROSTENEDIOL
A
E
WRI = Within Reference Interval
RI = Reference Interval
Below RI
WRI Low
WRI Optimal
WRI High
Above RI

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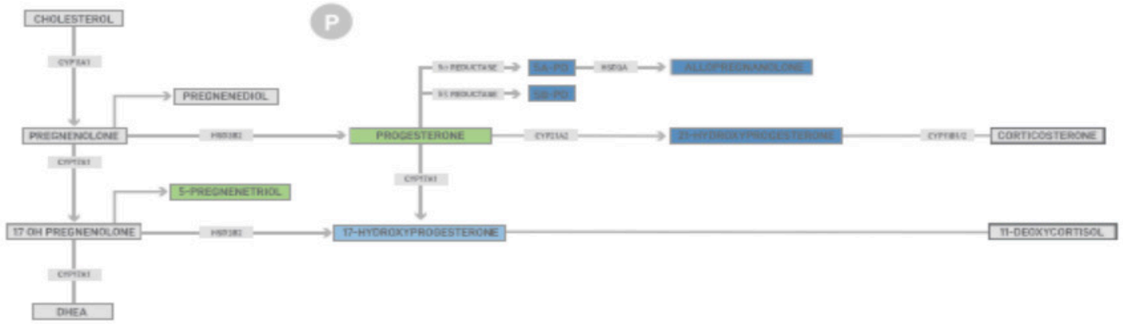
Progesterone
METABOLITES



Progesterones		Result	Unit	L WRI H	Reference Interval
Progesterone‡	(P4)	0.10	ng/mg Creat/Day		0.00 – 0.34
5α-Pregnanediol‡	(5A-PD)	4	ng/mg Creat/Day		9 – 50
5β-Pregnanediol‡	(5B-PD)	48	ng/mg Creat/Day		55 – 250
Allopregnanolone‡	(ALLOP)	0.7	ng/mg Creat/Day		0.8 – 6.4
21-Hydroxyprogesterone‡	(21-OHP)	0.36	ng/mg Creat/Day		0.6 – 3.0
17-Hydroxyprogesterone‡	(17-OHP)	0.21	ng/mg Creat/Day		0.19 – 0.85
5-pregnenetriol‡	(5-PT)	54	ng/mg Creat/Day		35 – 105
Ratios and Calculations		**Result**	**Unit**	**L WRI H**	**Reference Interval**
5A-PD:5B-PD‡	(alpha vs beta metabolism)	0.079			0.06 – 0.24

Progesterone in male health

- Progesterone important in male health too, although not always considered
- Building block for testosterone and bone mass
- Important to nervous and cardiovascular systems
- Helps with blood sugar balance
- Regulates vital sperm functions including motility
- In relation to the Prostate progesterone balances the proliferative effects of oestrogen

Oestrogen dominance in men

Oestrogen dominance in men is linked to :

- Cardiovascular health
- Prostate health
- Urinary Issues
- Infertility
- Erectile dysfunction

Hammes et al., 'Impact of estrogens in males and androgens in females,' J Clinical Invest 2019. DOI :10.1172/JCI125755

Progesterone and the prostate

- Progesterone receptor (PR) localizes in the prostate stroma.
- Progesterone suppresses stromal cell proliferation with implications in BPH.
- PR suppresses tumour-favouring microenvironment in the prostate.
- PR regulates stromal differentiation and potentially prevents reactive stroma.
- The impact of PR on prostate diseases warrants further investigations.

Chen et al., 'Progesterone receptor in the prostate: A potential suppressor for benign prostatic hyperplasia and prostate cancer' , J Steriod Biochem & Molecular Biol 2017. https://doi.org/10.1016/j.jsbmb.2016.04.008

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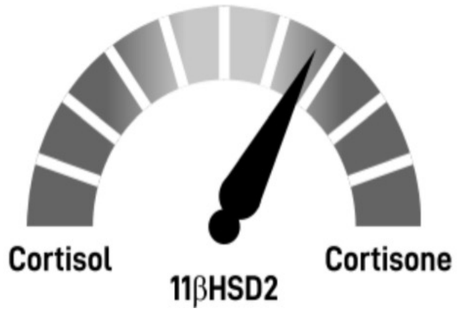
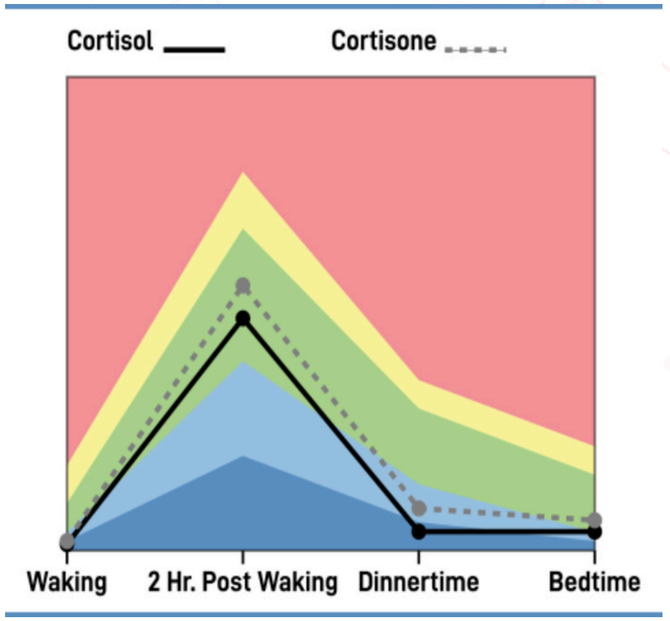
11 BHSD2 activity

CORTICOIDS





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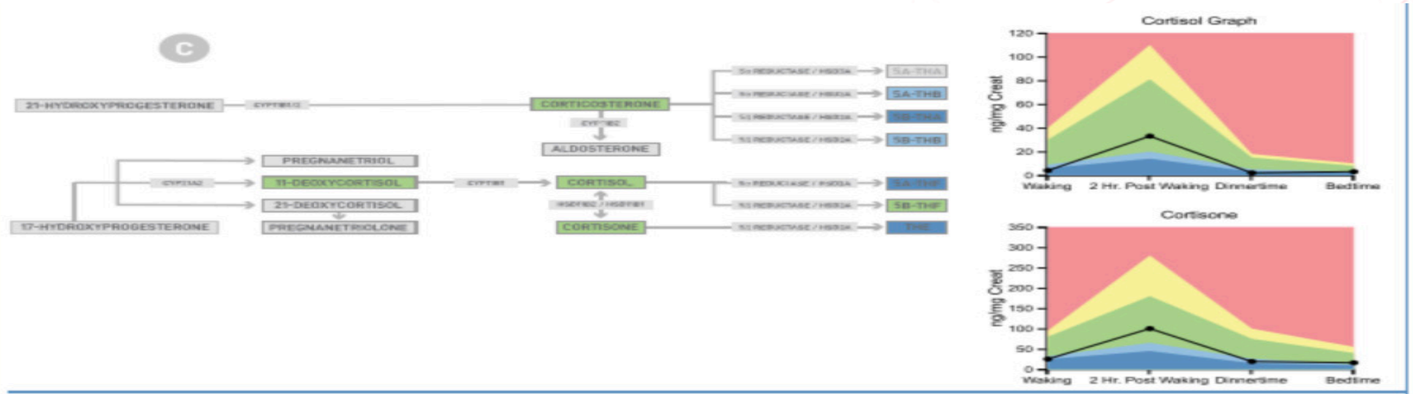
Adrenal
METABOLITES



Free Cortisol and Cortisone		Result	Unit	L	WRI	H	Reference Interval
Cortisol Waking‡		4	ng/mg Creat				6 – 40
Cortisol Waking+2hrs‡		33	ng/mg Creat				14 – 110
Cortisol Dinnertime‡		2	ng/mg Creat				3 – 18
Cortisol Bedtime‡		3	ng/mg Creat				2 – 10
Cortisol/day‡	(F)	11	ng/mg Creat/Day				9 – 35
Cortisone Waking‡		25	ng/mg Creat				25 – 95
Cortisone Waking+2hrs‡		100	ng/mg Creat				45 – 280
Cortisone Dinnertime‡		19	ng/mg Creat				15 – 100
Cortisone Bedtime‡		16	ng/mg Creat				10 – 55
Cortisone/day‡	(E)	45	ng/mg Creat/Day				30 – 95
Creatinine Waking		44.3	mg/dL				35 – 240

Notes:
WRI – Within Reference Interval - represented by bracket and stated ranges on report, Dark Blue = Below RI, Light Blue = WRI low, Green = Optimal, Yellow = WRI high, Red = Above RI, <dl = result below detection limit
‡This test was developed and its performance characteristics determined by Doctor's Data Laboratories in a manner consistent with CLIA requirements. The U.S. Food and Drug Administration (FDA) has not approved or cleared this test; however, FDA clearance is not currently required for clinical use.
Methodology: LCMS QQQ

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

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Corticoid
RATIOS

Free Cortisol and Cortisone		Result	Unit	L WRI H	Reference Interval
Creatinine Waking+2hrs		87.7	mg/dL		35 – 240
Creatinine Dinnertime		74.8	mg/dL		35 – 240
Creatinine Bedtime		78.3	mg/dL		35 – 240
Creatinine/day		70.7	mg/dL/Day		35 – 240
Corticoid Metabolites and DHEA		**Result**	**Unit**	**L WRI H**	**Reference Interval**
Corticosterone‡	(B)	10	ng/mg Creat/Day		6 – 34
Tetrahydrodehydrocorticosterone‡	(5B-THA)	22	ng/mg Creat/Day		44 – 150
5β-Tetrahydrocorticosterone‡	(5B-THB)	63	ng/mg Creat/Day		58 – 240
5α-Tetrahydrocorticosterone‡	(5A-THB)	99	ng/mg Creat/Day		90 – 380
11-Deoxycortisol‡	(11-DOC)	0.46	ng/mg Creat/Day		0.30 – 1.2
5α-Tetrahydrocortisol‡	(5A-THF)	334	ng/mg Creat/Day		420 – 1060
5β-Tetrahydrocortisol‡	(5B-THF)	1020	ng/mg Creat/Day		690 – 2240
Tetrahydrocortisone‡	(THE)	929	ng/mg Creat/Day		1200 – 3000
Dehydroepiandrosterone‡	(DHEA)	15	ng/mg Creat/Day		18 – 170
Dehydroepiandrosterone Sulfate‡	(DHEAS)	62	ng/mg Creat/Day		25 – 660
Ratios and Calculations		**Result**	**Unit**	**L WRI H**	**Reference Interval**
DHEA+DHEAS‡		77	ng/mg Creat/Day		39 – 760
THE+5A-THF+5B-THF‡	(Metabolized Cortisol)	2280	ng/mg Creat/Day		2000 – 6000
5A-THF+5B-THF/THE‡	(Cortisol/Cortisone Metabolites)	2			0.6 – 1.2
Cortisol/Cortisone‡	(11B HSD activity)	0.24			0.18 – 0.60
5A-THF/5B-THF ratio‡	(alpha vs beta metabolism)	0.33			0.15 – 0.65

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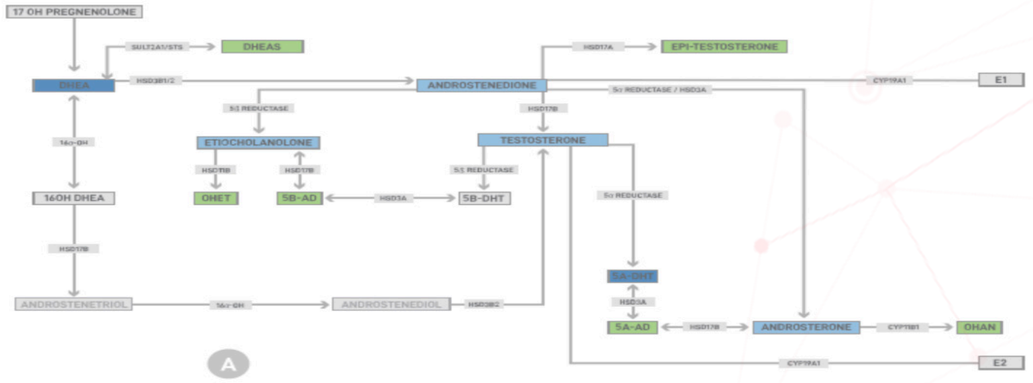
Androgen
METABOLITES



Androgens		Result	Unit	L WRI H	Reference Interval
Androstenedione‡	(A4)	0.92	ng/mg Creat/Day		0.8 – 7.7
EPI-Testosterone‡	(EPI-T)	26	ng/mg Creat/Day		0.0 – 40
Testosterone‡	(T)	12	ng/mg Creat/Day		12 – 63
Androsterone‡	(AN)	762	ng/mg Creat/Day		470 – 2400
11-hydroxy-Androsterone‡	(OHAN)	376	ng/mg Creat/Day		210 – 920
5α-Androstanediol‡	(5A-AD)	20	ng/mg Creat/Day		10 – 110
5α-Dihydrotestosterone‡	(5A-DHT)	0.4	ng/mg Creat/Day		0.7 – 6.3
Etiocholanolone‡	(ET)	808	ng/mg Creat/Day		490 – 2100
Androgens		**Result**	**Unit**	**L WRI H**	**Reference Interval**
11-hydroxy-Etiocholanolone‡	(OHET)	137	ng/mg Creat/Day		35 – 380
5β-Androstanediol‡	(5B-AD)	64	ng/mg Creat/Day		18 – 200
Dehydroepiandrosterone‡	(DHEA)	15	ng/mg Creat/Day		18 – 170
Dehydroepiandrosterone Sulfate‡	(DHEAS)	62	ng/mg Creat/Day		25 – 660
Ratios and Calculations		**Result**	**Unit**	**L WRI H**	**Reference Interval**
DHEA+DHEAS‡		77	ng/mg Creat/Day		39 – 760
Androsterone (5α) / Etiocholanolone (5β)‡	(5α Reductase Activity)	0.94			0.5 – 1.4
Testosterone / EPI-Testosterone‡		0.48			0.6 – 2.4

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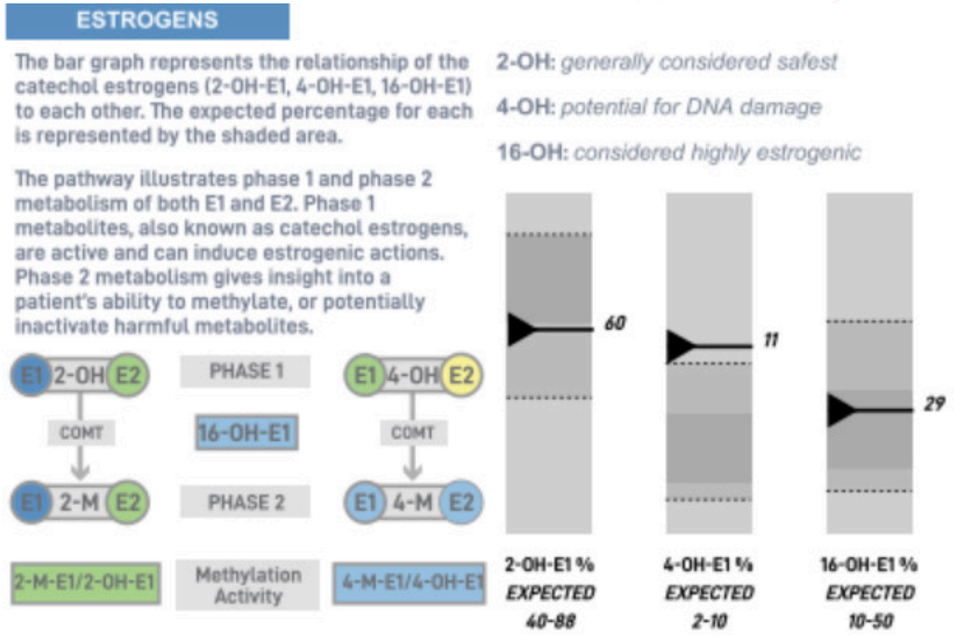
OESTROGENS



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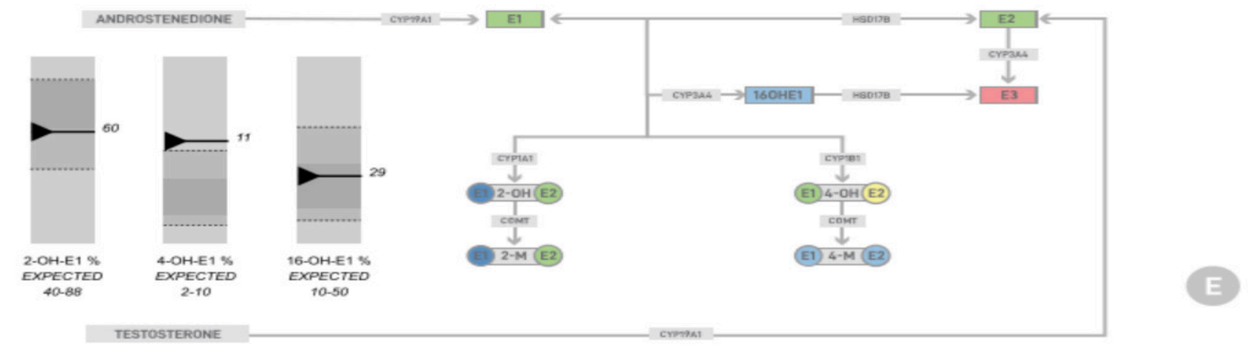
Oestrogen
METABOLITES



Estrogens		Result	Unit	L WRI H	Reference Interval
Estrone‡	(E1)	4.3	ng/mg Creat/Day		1.8 – 5.0
2-Hydroxyestrone‡	(2-OH-E1)	1.5	ng/mg Creat/Day		2.7 – 8.6
4-Hydroxyestrone‡	(4-OH-E1)	0.28	ng/mg Creat/Day		0.0 – 0.5
16α-Hydroxyestrone‡	(16-OH-E1)	0.71	ng/mg Creat/Day		0.5 – 4.9
2-Methoxyestrone‡	(2-M-E1)	0.18	ng/mg Creat/Day		0.5 – 1.6
4-Methoxyestrone‡	(4-M-E1)	0.030	ng/mg Creat/Day		0.03 – 0.17
Estradiol‡	(E2)	1.0	ng/mg Creat/Day		0.4 – 2.0
2-Hydroxyestradiol‡	(2-OH-E2)	0.20	ng/mg Creat/Day		0.02 – 0.55
4-Hydroxyestradiol‡	(4-OH-E2)	0.46	ng/mg Creat/Day		0.00 – 0.50
2-Methoxyestradiol‡	(2-M-E2)	0.033	ng/mg Creat/Day		0.01 – 0.08
4-Methoxyestradiol‡	(4-M-E2)	0.013	ng/mg Creat/Day		0.013 – 0.034
Estriol‡	(E3)	5.4	ng/mg Creat/Day		1.2 – 4.1

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Oestrogen
RATIOS & CALCULATIONS

Ratios and Calculations		Result	Unit	L WRI H	Reference Interval
2-OH-E1 %‡	(2-OH-E1 %)	60	%		40 – 88
4-OH-E1 %‡	(4-OH-E1 %)	11	%		2 – 10
16-OH-E1 %‡	(16-OH-E1 %)	29	%		10 – 50
2-M-E1:2-OH-E1‡	(COMT/Methylation activity)	0.11			0.08 – 0.50
2-M-E2:2-OH-E2‡	(COMT/Methylation activity)	0.16			0.07 – 0.86
4-M-E1:4-OH-E1‡	(COMT/Methylation activity)	0.10			0.09 – 1.0
4-M-E2:4-OH-E2‡	(COMT/Methylation activity)	0.026			0.02 – 0.50
2-OH-E1:16-OH-E1 ‡		2.1			≥ 1.5
4-OH-E1:2-OH-E1‡		0.19			0.00 – 0.14

Oxidative Stress Metabolite		Result	Unit	L WRI H	Reference Interval
8-hydroxy-2'-deoxyguanosine‡	(8-OHdG)	6.5	ng/mg Creat/Day		≤ 7.7

Catechol oestrogens & the prostate

- Study involving benign prostatic hyperplasia (BPH-1) cells showed that catechol estrogens especially 4-OHE2, elicited significant genotoxic effects as compared to E2
- 4-OHE2 showed greater ability to neo-plastically transform BPH-1 cells

Mosli HA, Tolba MF, Al-Abd AM, Abdel-Naim AB. Catechol estrogens induce proliferation and malignant transformation in prostate epithelial cells. Toxicol Lett. 2013;220(3):247-258. doi:10.1016/j.toxlet.2013.05.002

Prostate cancer & CYP1B1

• Expression of CYP1B1 is significantly increased in hormone-related cancers

• PCa patients with high CYP1B1 expression have lower survival rates.

• Here, we found that the expression of CYP1B1 was positively correlated with the Gleason score of PCa, with the highest expression in castration resistant prostate cancer tissues. Compared with androgen-dependent PCa cells, androgen-independent PCa cells had higher levels of CYP1B1.

Lin, Q., Cao, J., Du, X. et al. CYP1B1-catalyzed 4-OHE2 promotes the castration resistance of prostate cancer stem cells by estrogen receptor α-mediated IL6 activation. Cell Commun Signal 20, 31 (2022). https://doi.org/10.1186/s12964-021-00807-x

Case Study Summary: DAVID

HuMAP has identified in David :

- Upregulated aromatase enzyme
- Low progesterone metabolites
- Low androgen metabolites
- High 4:2 oestrogen ratio
- Low COMT activity
- Some cortisol imbalance

Case Study Summary: DAVID

What David did : FOOD FIRST APPROACH

Metabolic support

- Kept on Cardiometabolic Plan, keep insulin under control
- Continue to lose weight – more exercise
- Avoid beige sugary foods/ reduce alcohol / red wine
- Add in more fibre to support phase 3 detox part cruciferous veg

Avoided exogenous sources of oestrogen/ xenoestrogens

Gut Health

- More hydration
- Fibre

Liver Support

- NAC / vitamin C with bioflavonoids (only if drinking)
- Reduce alcohol

Case Study Summary: DAVID

What we did :

Supplements

- ONE multi
- Glucose support
- Broccoli seed extract /sulforaphane
- Vitamin C
- Magnesium glycinate
- Resveratrol

Lifestyle

- Continue with paced walking
- Alcohol
- Sleep hygiene
- Weight training
- Mediation

COMT/methylation Support

Food FIRST

- Food rich in folate /B12
- Support Glucuronidation
  - Cruciferous veg
  - Curcumin
  - Resveratrol
  - Rosemary
  - Dandelion
  - Garlic

Supplements to consider

- Methylated folate - 400-3000mcg or folinic acid
- Methyl B12 50mcg – 1000mcg
- Magnesium 150-600mg
- Broccoli seed extract /sulforaphane
- DIM
- Betaine

Case Study :
DAVID now 7 months after HuMAP

David was diagnosed with prostate cancer via biopsy shortly after the HuMAP results

- Gleason score of 9
- He did 1 month of external beam radiotherapy and 6 months androgen deprivation therapy, which he has completed and currently is in remission and being monitored
- I contacted GP and oncologist with dietary guidelines and supplement list
- Armed with the blood tests and the HuMAP testing info we were able to get him on a supportive dietary and lifestyle regime that has been super important for his overall health
- David has sent off another HuMAP retest and we await the results

KATE GARDEN
HEALTH

OMNOS™ regenerus labs

Case Study :
ANY QUESTIONS

Thank you for listening.

Do get in touch if you have any further questions

info@kategarden.co.uk

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