Understanding and Implementing the DUTCH test: Estrogen and estrogen metabolism

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DUTCH Testing with Precision Analytical
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adapted from Dr. Carrie Jones and DUTCH resources

Medical Disclaimer:

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Objectives for today

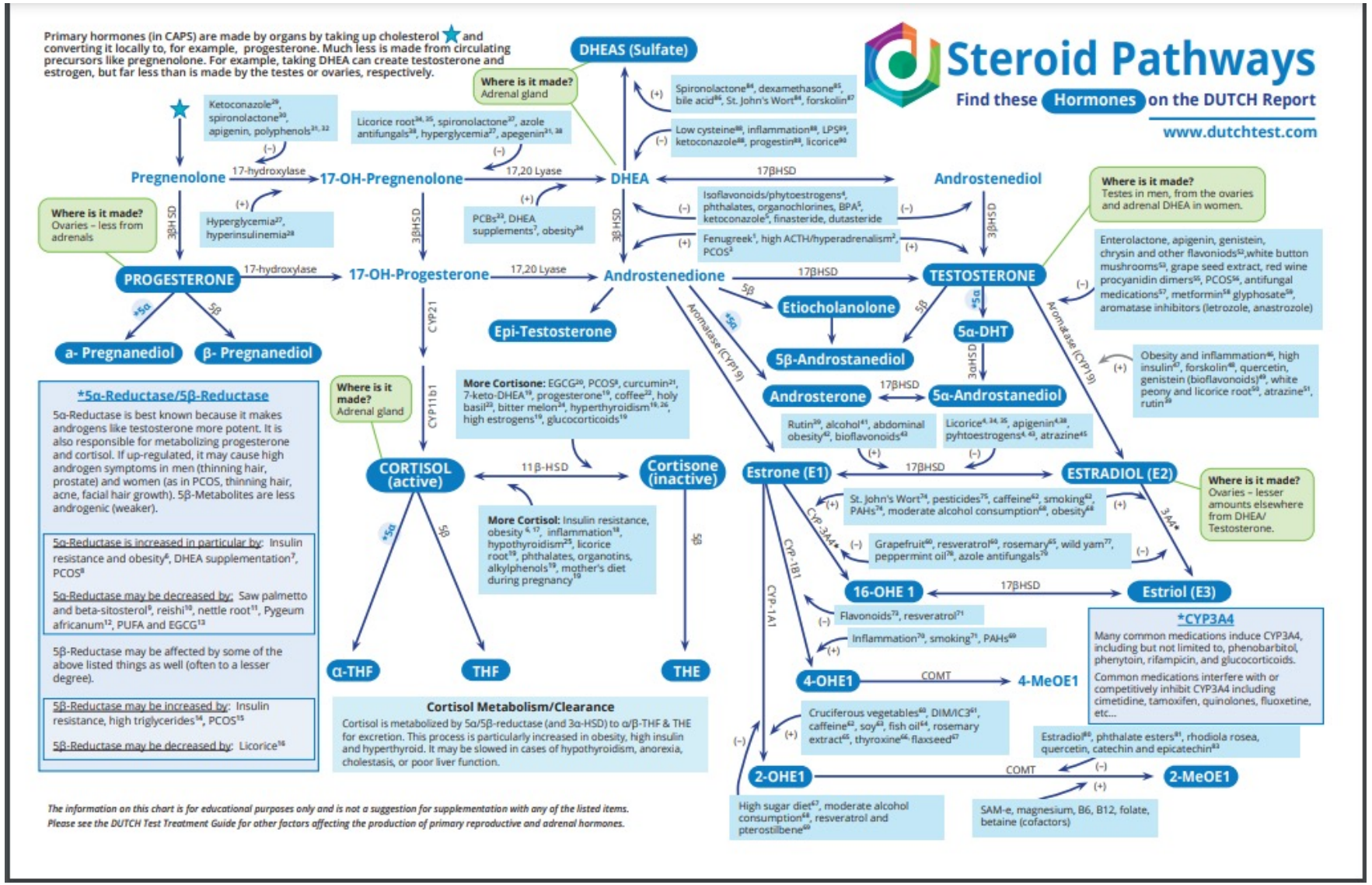
- Define Estrogens
- Review Estrogen effects on the body
- Review Estrogen Detoxification
- Understand Estrogen metabolism on a DUTCH test
- Understand testing and evaluation for overall Estrogen Metabolism

Estrogen

- What is estrogen?
  - Estrogen is a steroid hormone
- Steroid hormones include:
  - Sex Hormones
    - Estrogen
    - Progesterone
    - Testosterone
  - Adrenal Hormones
    - DHEA
    - Cortisol

Estrogen

Steroid hormone



Estrogen

- There are 3 primary Estrogens
- Estrogens:
  - Estrone (E1):
    - a weak estrogen
    - Converts to estradiol
  - Estradiol (E2)
    - Most potent estrogen in cycling females
  - Estriol (E3)
    - Weak estrogen
    - More prominent in pregnancy

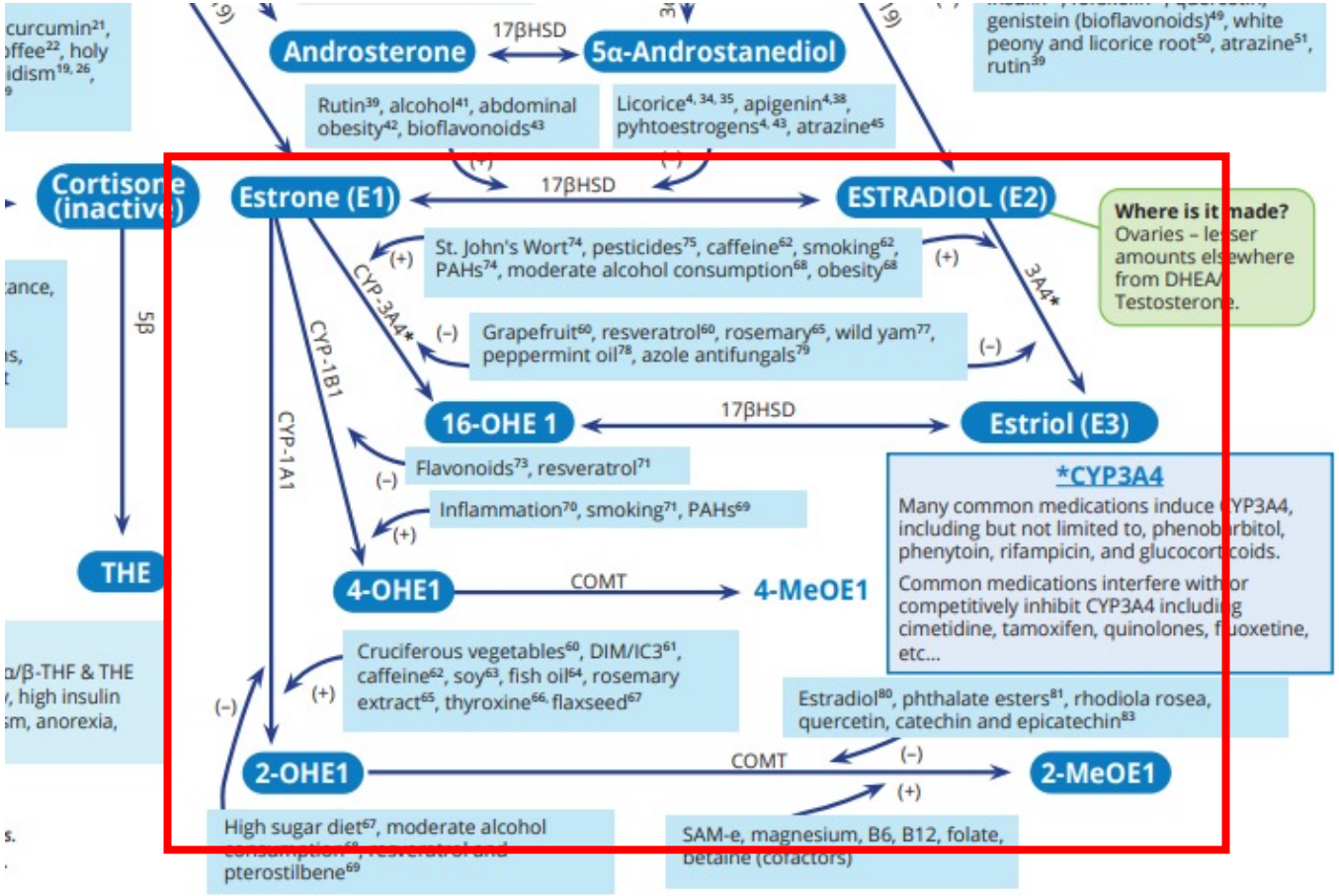
Estrogen

- Where do Estrogens come from?
  - Estrogens are formed primarily in the ovaries in the granulosa cells; secondarily in the liver, adrenals, and fatty tissue (through aromatization)

  - What do Estrogens Do?
    - Blood vessel and cardiovascular health
    - Bone health
    - Protective for the brain
    - E3 is considered anti-inflammatory, and some say “protects against cancer”

Estrogen

- Estrogens are the last stop on the steroid pathway
- Estrogens are converted from Testosterone and DHEA (androgens) through aromatization
- Aromatization is a process of conversion through an enzyme from the androgens to estrogen



Estrogen and detoxification

- Detoxification means the process of breaking down
- Here we are discussing the break down of estrogens – or essentially what happens to estrogens once they are produced!

Estrogen detoxification

- Estrogen detoxification
- Also known as Estrogen Metabolism

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- Break down, or Estrogen Metabolism, occurs mostly in the liver
- The liver works all the time, 24/7, to help break down, or metabolize things

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- Once things are broken down, they can be excreted!

Estrogen Detoxification

- Once broken down, or metabolized, our body can get rid of it through excretion:

- Bile/intestines → stool
- Kidneys → urine
- Skin → sweat
- Lungs → breath/breathing

Estrogen Detoxification

- Estrogen Detoxification occurs in 3 Phases
- Phase I = metabolism
- Phase II = conjugation
- Phase III = excretion

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We test these on the DUTCH Test

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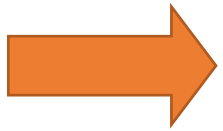


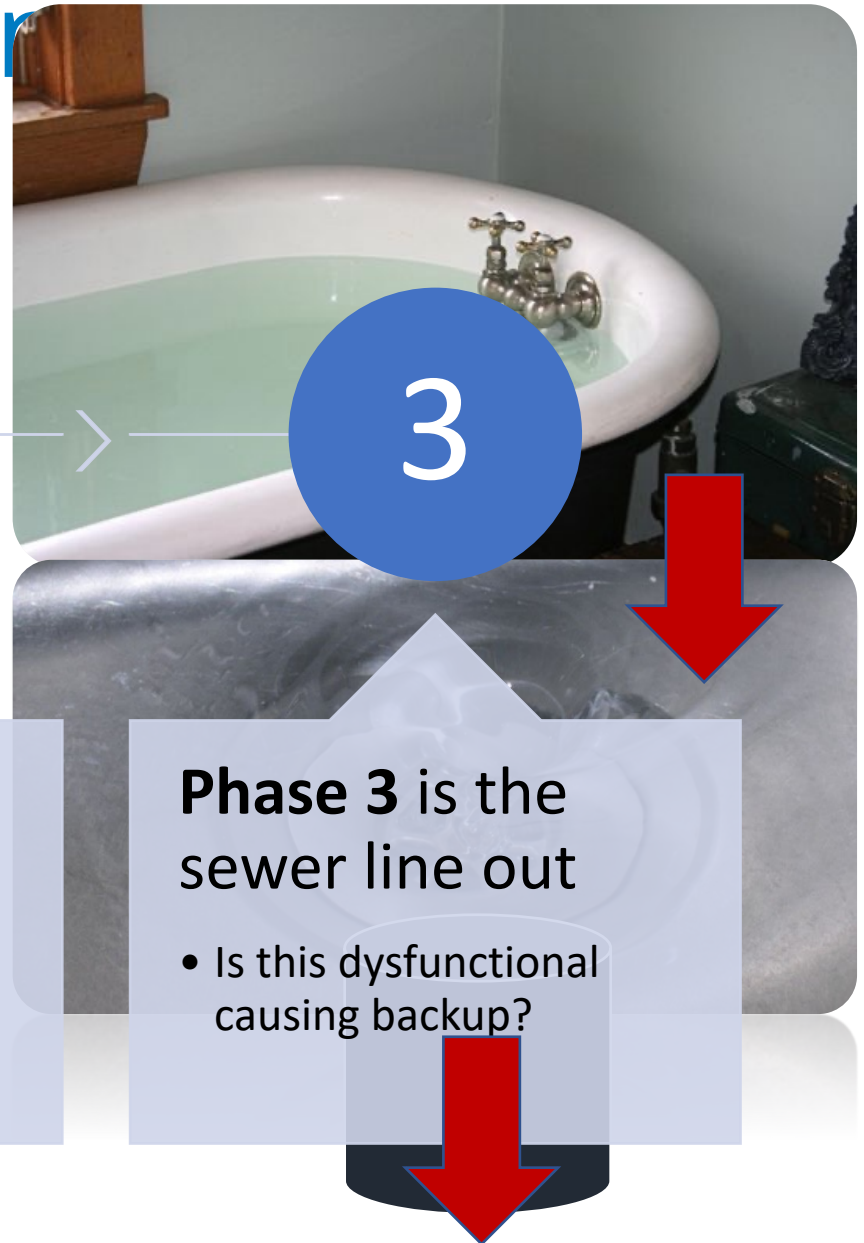
Seen in stool testing

ESTROGEN DETOXIFICATION

LEARN THIS AS PHASE 1→ 2 → 3

Estrogen Detoxification

Analogy from Dr. Carrie Jones



1

Phase 1 is the water filling up the tub

- Is the right type of water filling up the tub?
- How fast or slow is it filling up?

2

Phase 2 is the drain

- How open or closed is the drain?
- Is it open wide enough?

3

Phase 3 is the sewer line out

- Is this dysfunctional causing backup?

Estrogen Detox

The metabolites (products) from Phase I are
generally toxic ☹

The body tries to get these metabolites
from Phase I to Phase 2 quickly
to neutralize them

Hopefully you can excrete these metabolites quickly,
otherwise we run in to problems

Estrogen Detoxofiction

Importance of detoxofication

Those phase 1 toxic metabolites tend to hang out for milli or nano seconds but in that time, they can do **serious damage to things like DNA.**

Estrogen Detoxification

Those phase 1 toxic metabolites tend to hang out for milli or nano seconds but in that time, they can do **serious damage to things like DNA.**

When DNA is damaged or there are **mutations** created as a result of those toxic metabolites, you're more at risk for **estrogen-related cancers**.

Estrogen Detoxification

- Those phase 1 metabolites can also bind onto the estrogen receptor and activate them = **estrogen dominant symptoms**

Estrogen receptors are the lock and key to make estrogen do its work

E → Receptor

THEN estrogen can work its magic or danger

https://www.pinterest.com/pin/502644008395017730/

Estrogen Metabolism on the DUTCH test

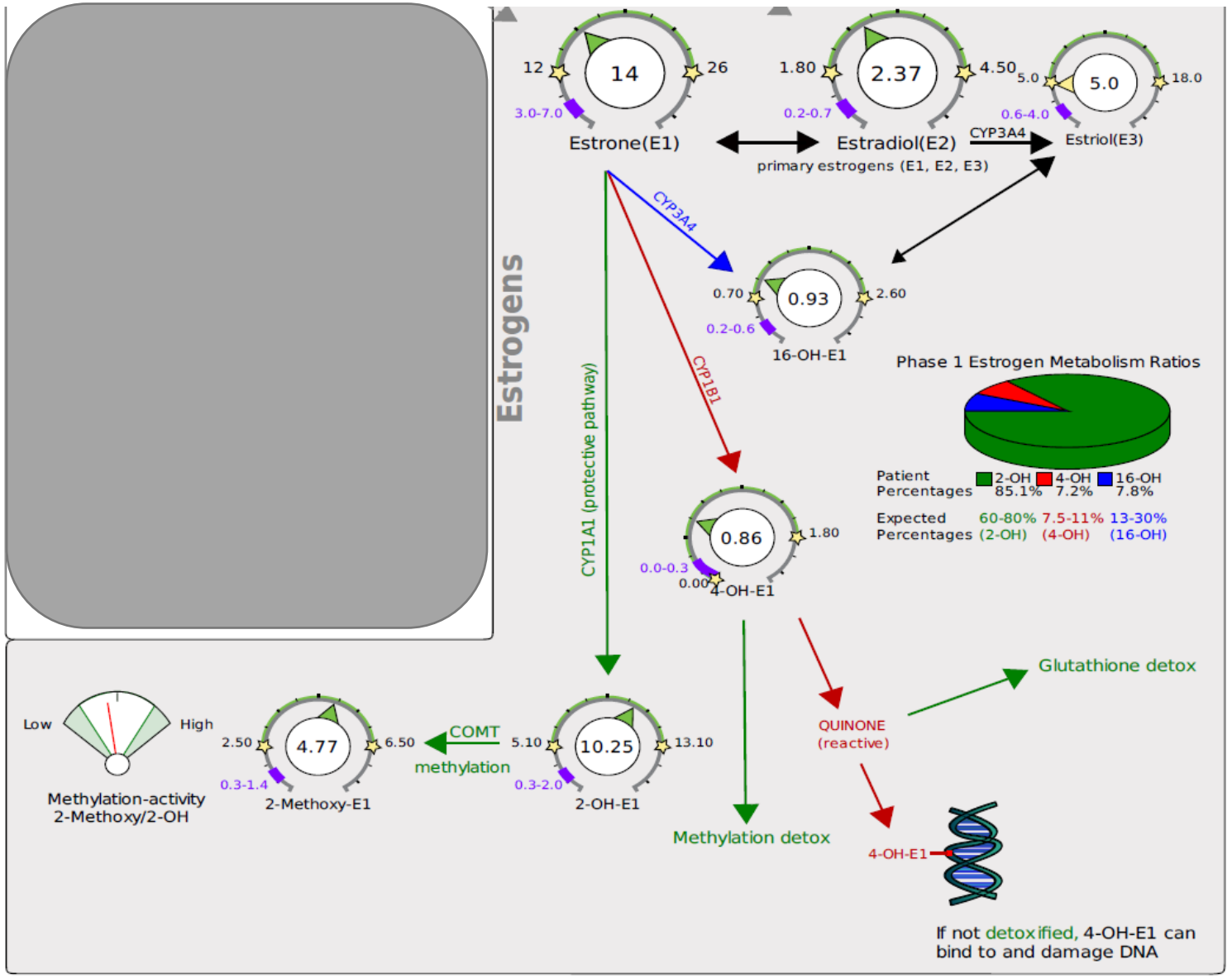
- On the DUTCH test we want to know:
- How much estrogen is made
- What do these estrogens do through Phase I
- What do these estrogens go through Phase II
- What do these things means?
  - Symptoms: PMS, sleep issues, poor mood, skin changes/acne, heavy periods, breast tenderness,
  - Is there estrogen dominance
  - Can this help understand risks including hormone cancers

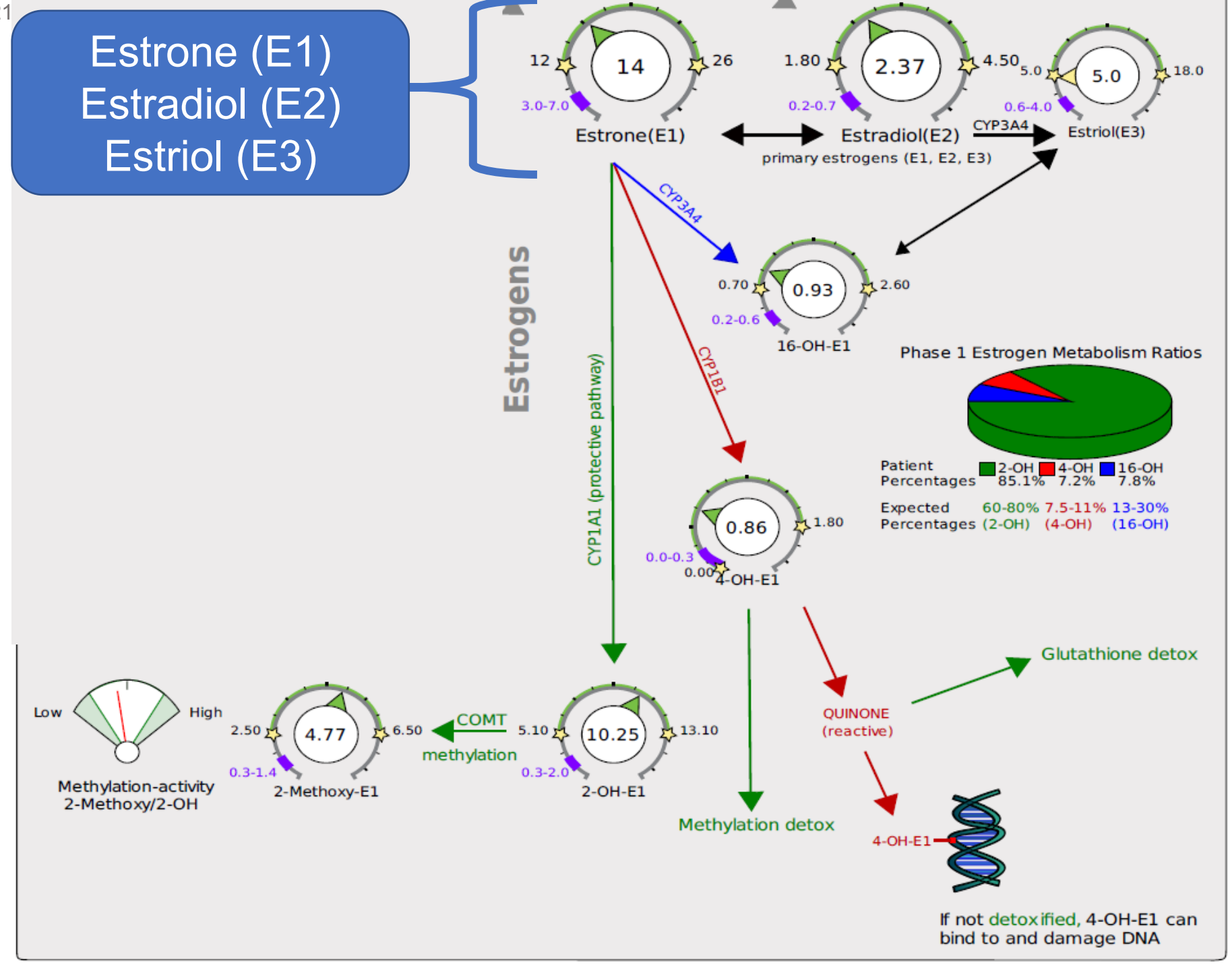
Estrogen Metabolism on DUTCH

- While there are different types of phase 1 detoxification, DUTCH specifically reports **hydroxylation (OH)**

- While there are different types of phase 2 detoxification, DUTCH specifically reports **methylation (methoxy)**

Estrogen Metabolism on DUTCH



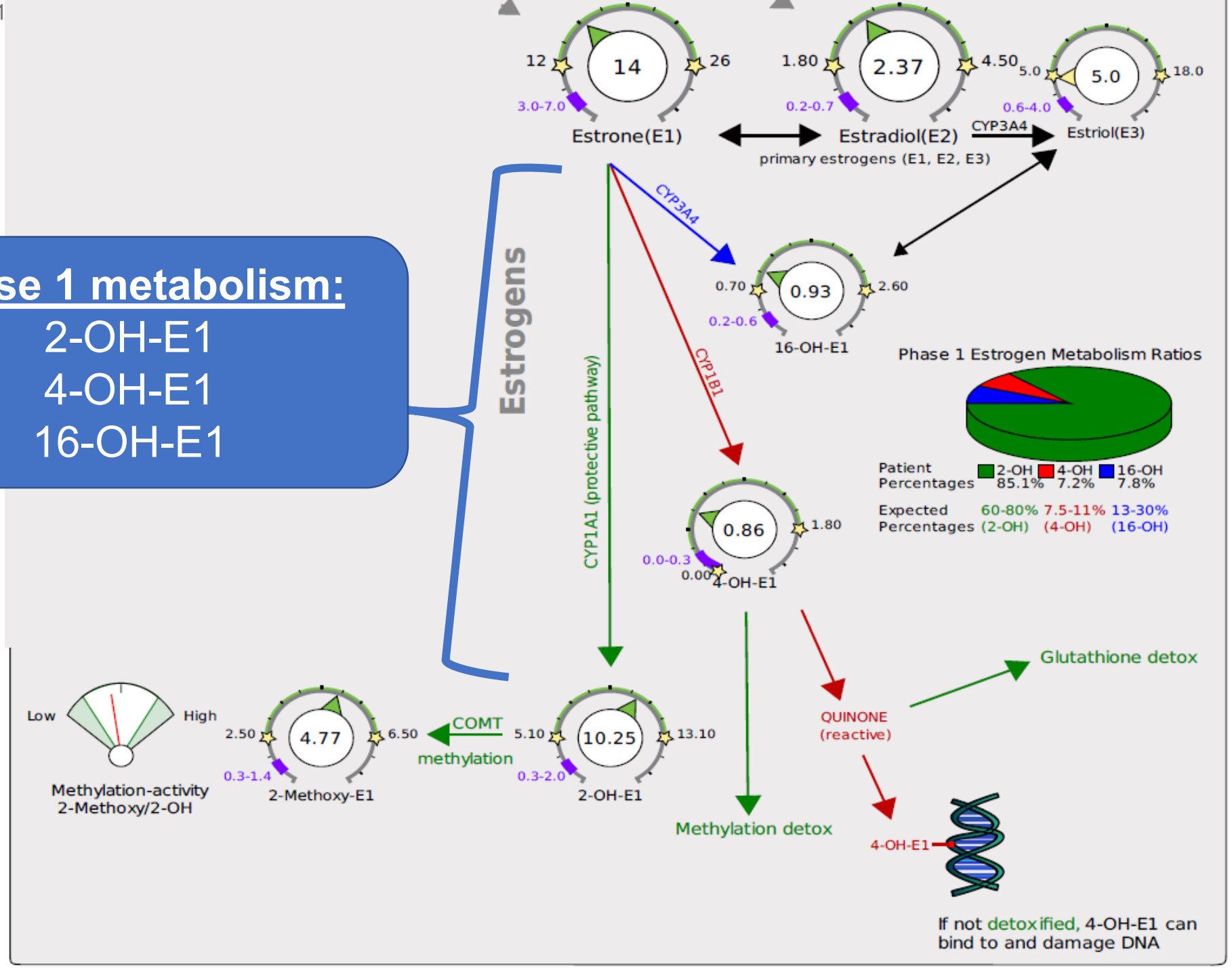


Phase 1 metabolism:

2-OH-E1

4-OH-E1

16-OH-E1



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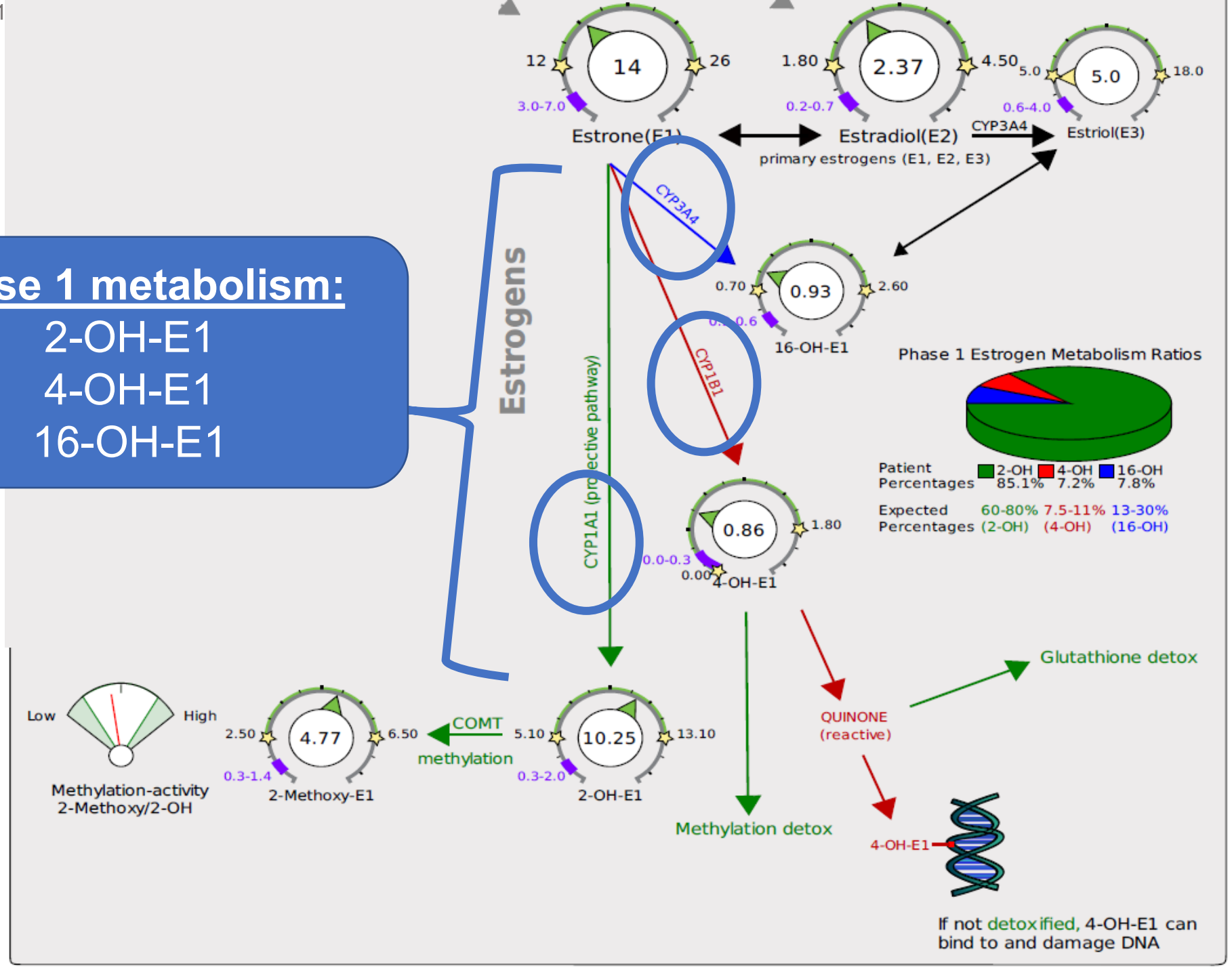

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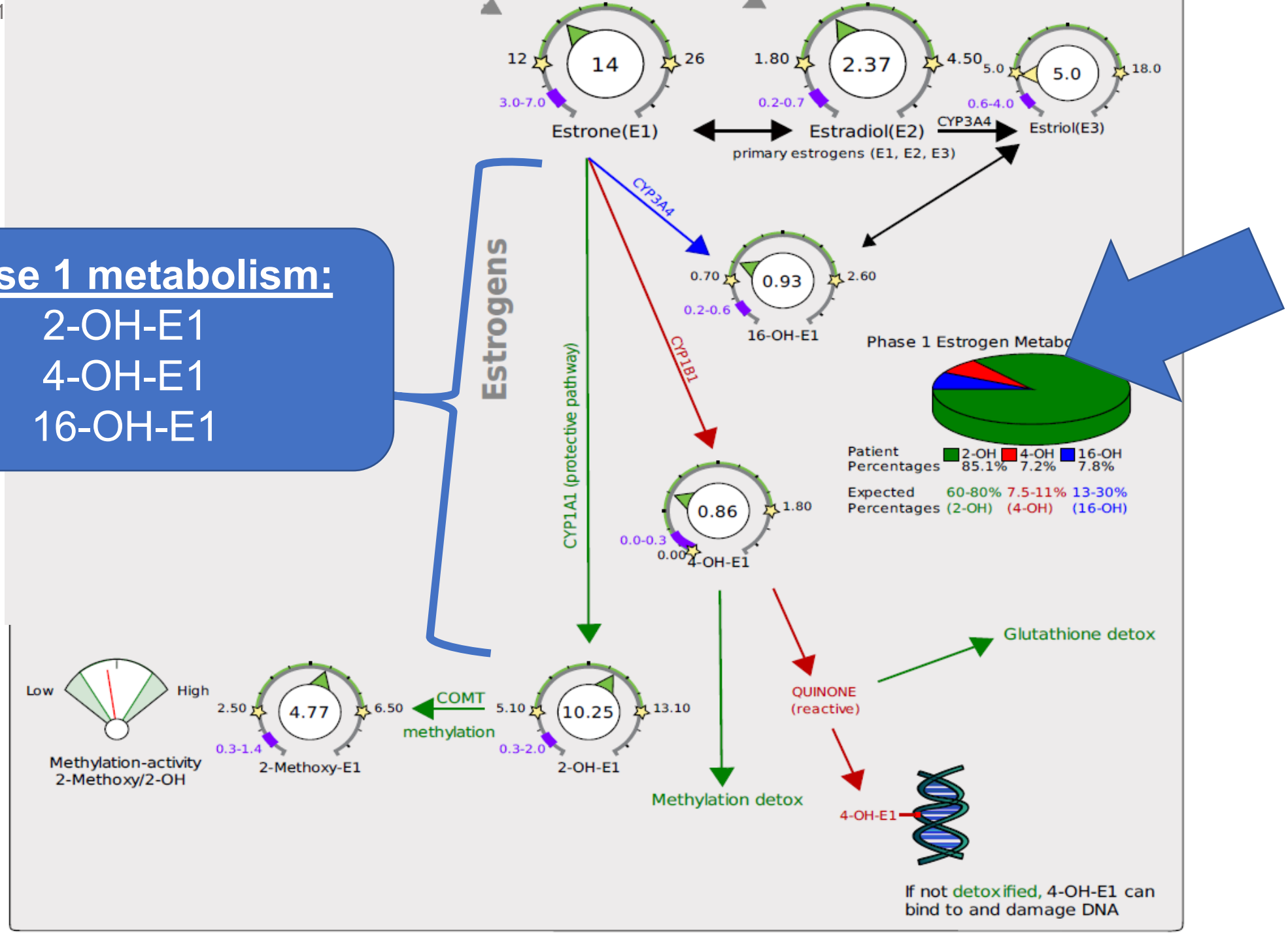


Estrogen and its metabolites

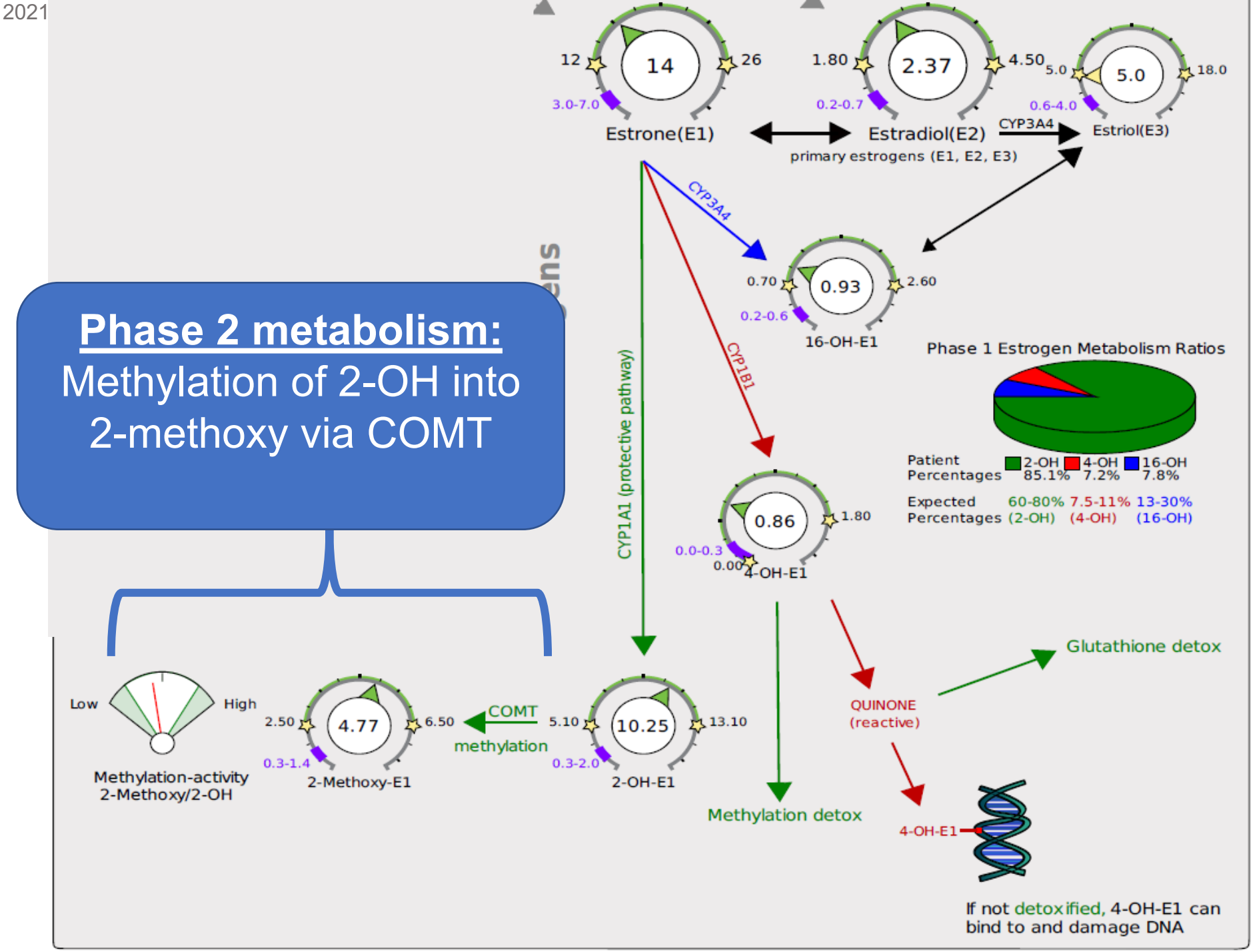
- **2-OH**
  - Generally considered “less carcinogenic.” ☺
  - Not nearly as likely to create DNA damage but could.
  - Can bind to the estrogen receptor but not that strongly.

Estrogen and its metabolites

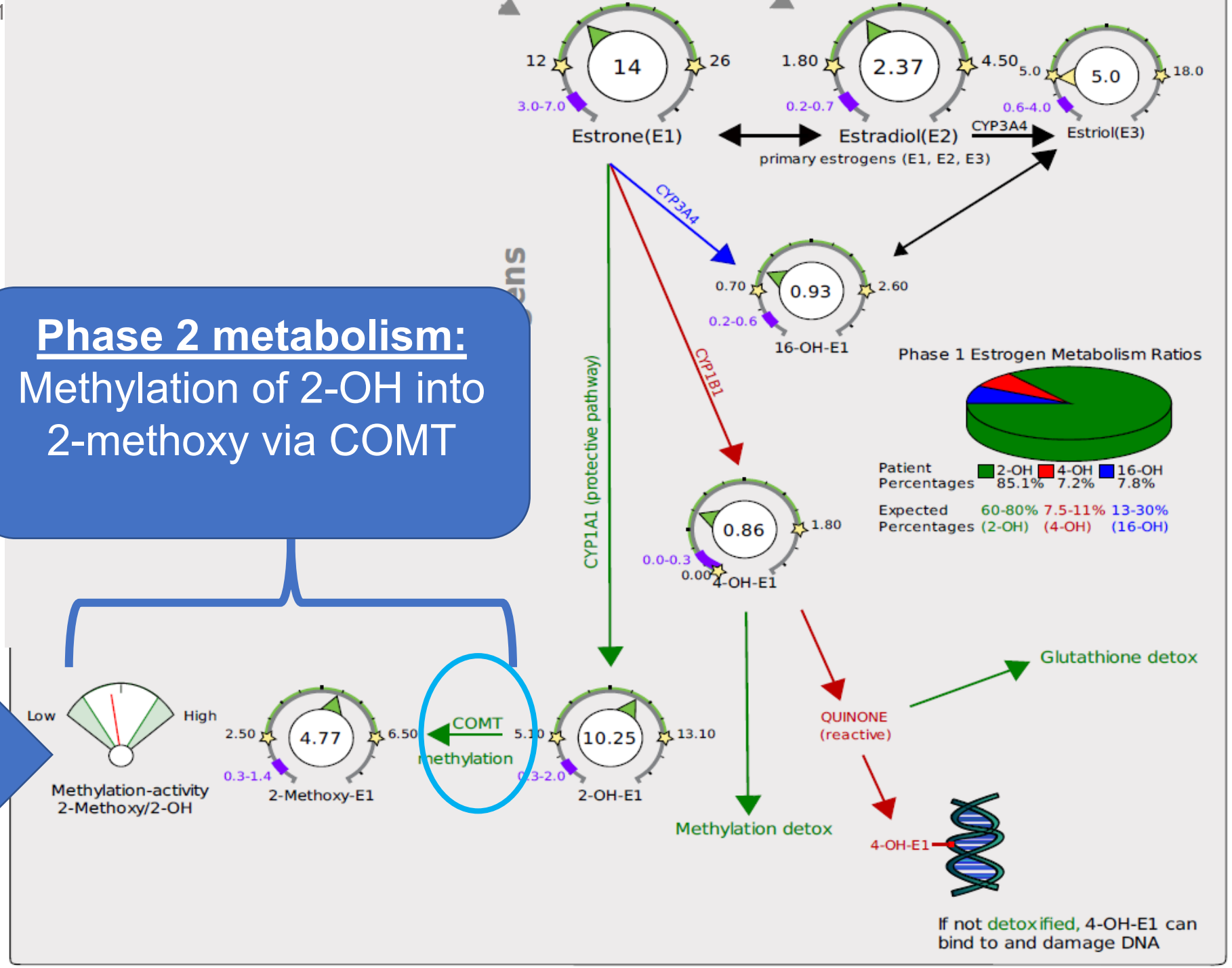
- **4-OH**
  - Generally considered “the most carcinogenic.” ☹
  - If not pushed into phase 2, it has an increased risk of DNA mutation.
  - Binds to the estrogen receptor better than the 2-OH metabolite.

Estrogen and its metabolize

- **16-OH**
  - Can turn into estriol (E3). ☺
  - Binds well to the estrogen receptor to activate it.
  - Considered proliferative in that it encourages cell growth.
    - Good for bones, perhaps bad for breast tissue especially if you have breast cancer.



Phase 2 metabolism:
Methylation of 2-OH into 2-methoxy via COMT



Phase 1 metabolism:

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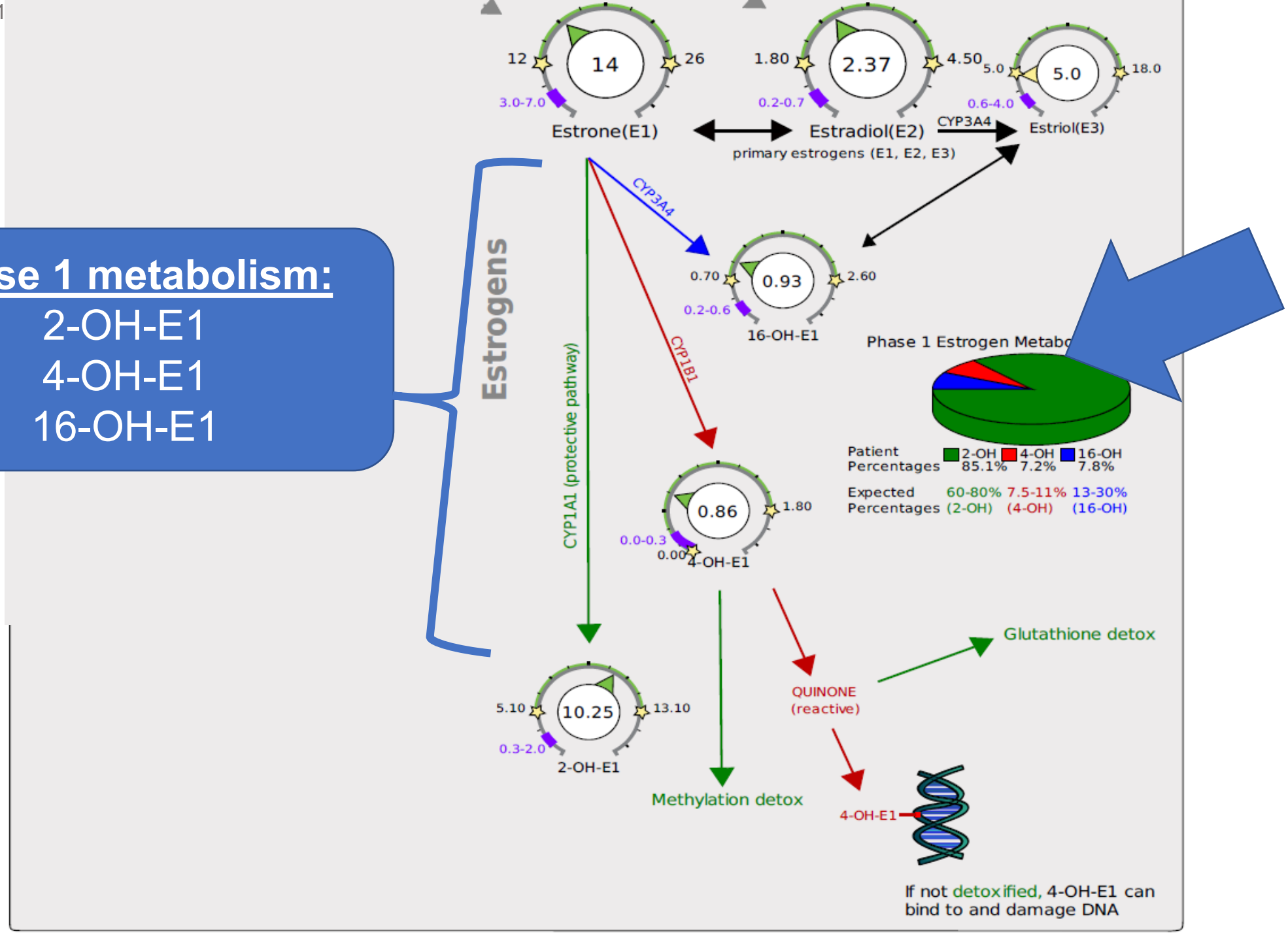
4-OH-E1

16-OH-E1



Estrogen Detoxification for Phase I

- Ideas for Phase I support:
- Medications that can affect Phase I:
  - Tagamet
- Foods:
  - Brassica family, apiacea (carrot) family, anti-inflammatory, anise
- Supplements:
  - DIM, I3C, sulforophane, queretin, resveratrol, thistle

Phase 2 metabolism:
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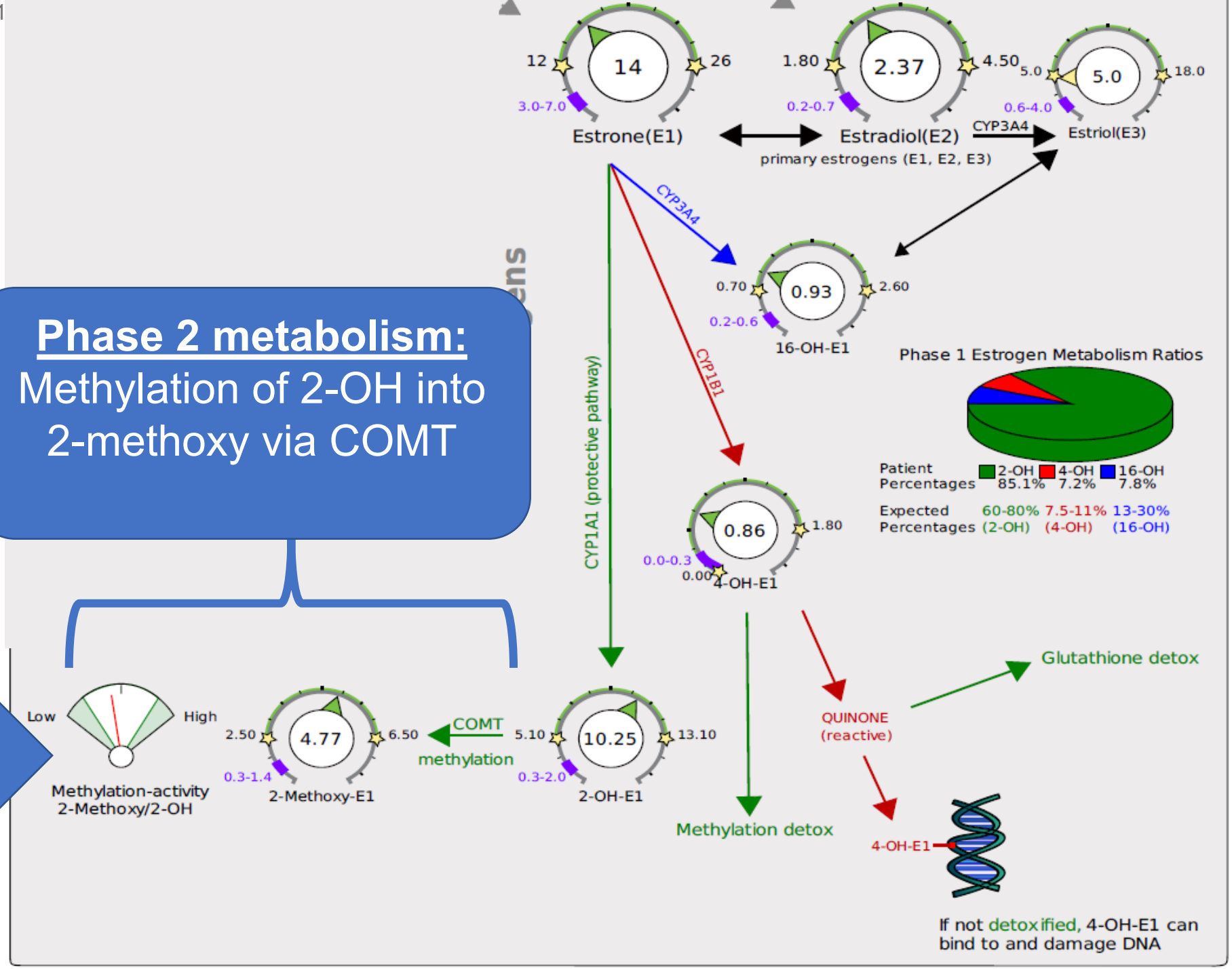


Estrogen Detox: Phase II

- This is really focusing on **COMT** support for methylation support:
- The DUTCH test shows methylation of estrogens only
- DUTCH test is not a genetic test, but may approximate methylation

Estrogen Detox Phase II

- Things to support Methylation and Phase II:
- Address GUT health
- Supplements to support COMT and estrogen methylation:
- Trimethylglycine
- SAMe
- Magnesium
- B12
- B6

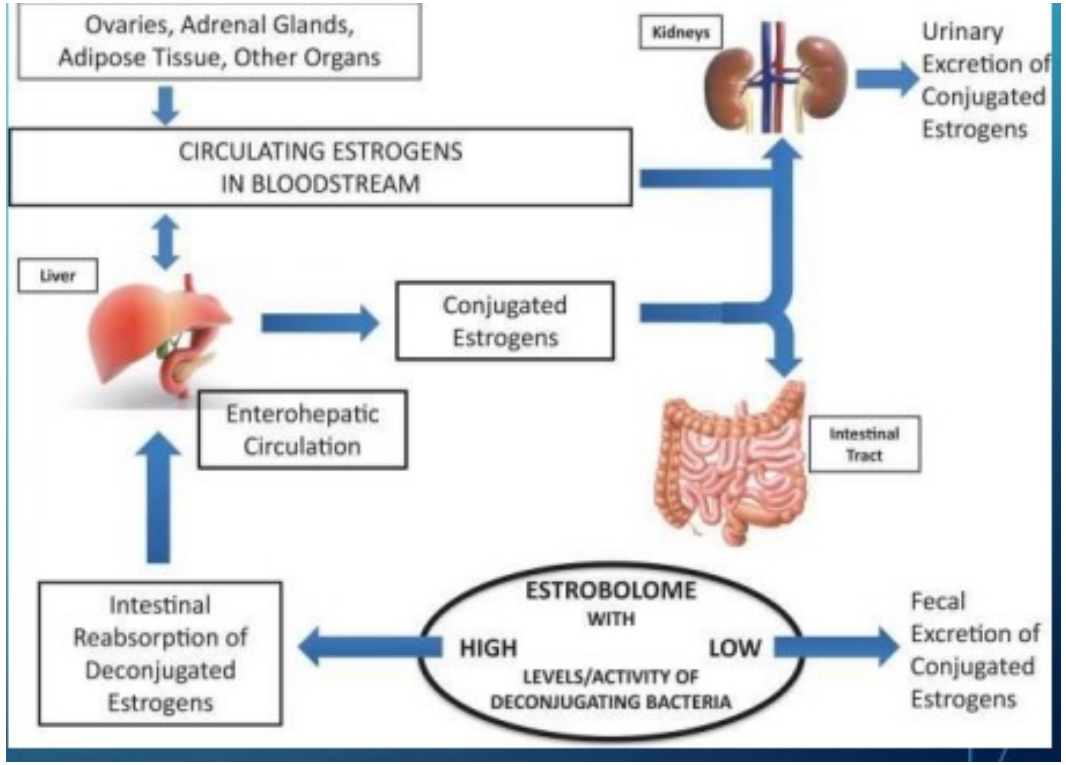
Estrogen Detox Phase II

- Address GUT health
- Slow COMT:
  - green tea
  - quercetin
- Supplements to support COMT and estrogen methylation:
  - Trimethylglycine
  - SAMe

- Supplements (cont'd)
  - Choline
  - Methionine
  - Magnesium
  - B12
  - B6

Estrogen Detox: Phase III

- From liver to stool excretion (Phase 3), the biggest player for estrogen metabolism and the gut microbiome is called the:
-
- **ESTROBOLOME**
  enteric bacteria
  that metabolize
  estrogens



Estrogen Detox: Phase III

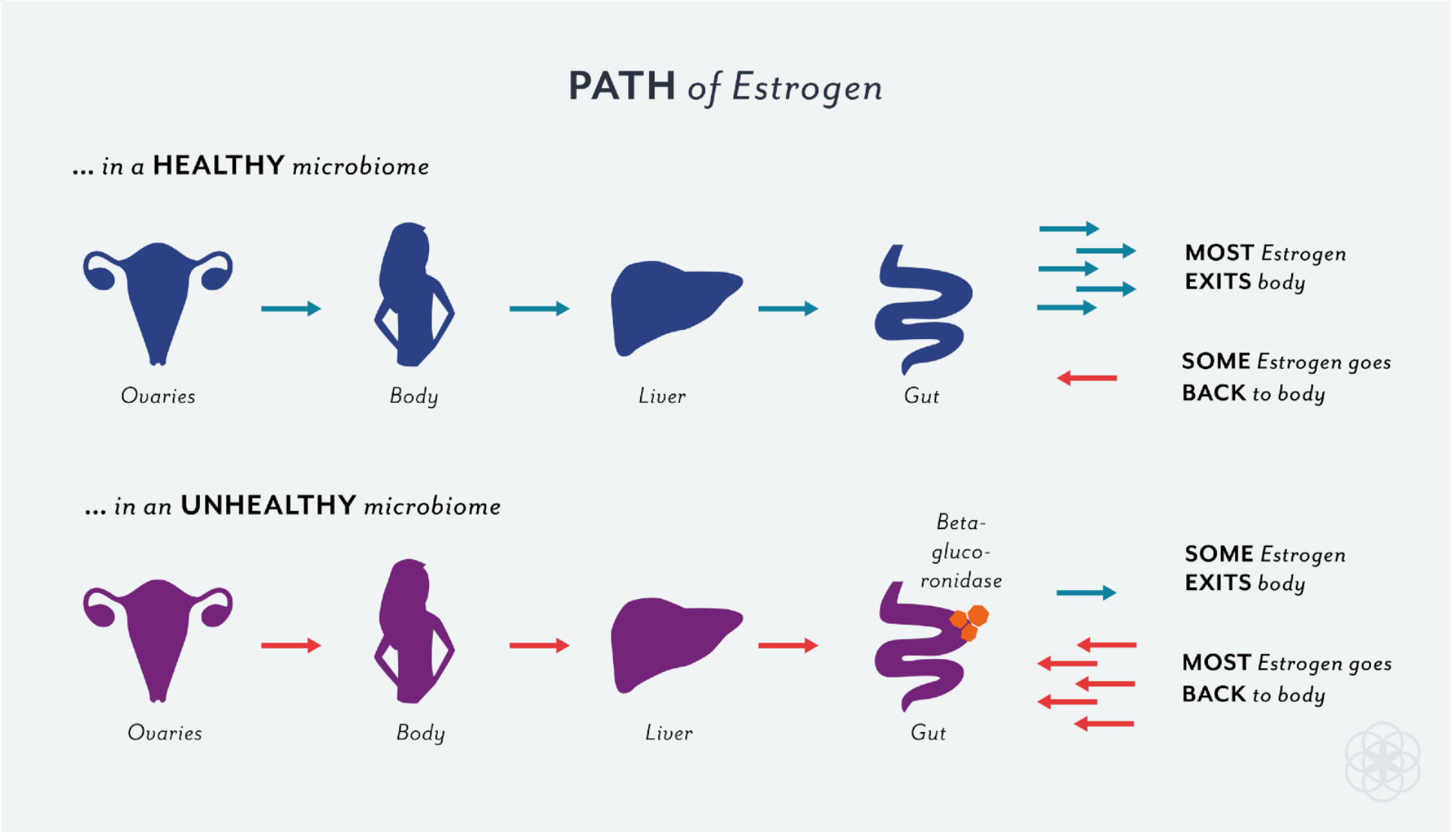
- **ESTROBOLOME**
- The major enzyme influencing the estrobolome is:
  - Beta-Glucuronidase, or
  - B-glucuronidase

B-Glucuronidase

unconjugates endogenous and exogenous estrogen

Gut microbiota regulates estrogen through the excretion of B-Glucuronidase

Estrogen Detox: Phase III



Estrogen Detox: Phase III

BETA GLUCURONIDASE

Can affect how much estrogen is excreted OR reabsorbed in the body

Estrogen Detox: Phase III

- Do **stool testing** to see what's going on in there.
- Evaluate your **antibiotic and medication** use that affect the microbiome
- Reduce or eliminate **alcohol and chemicals/toxicants**
- Make sure you **poop** at least daily
- Evaluate your **diet** – the standard American diet is associated with worse intestinal health overall
- Consider **pre and probiotics or fermented foods** like sauerkraut and kimchi (watch out for sugar in Kombucha = not good)
- Eat washed, raw, organic **carrots** – the whole carrot. Not baby.
- Supplement: **Calcium-d-glucarate**

Estrogen Detox: in Summary

- DUTCH reviews:
- Estrogen production
- Estrogen metabolism through:
  - **Phase I**
  - **Phase II**

- Stool Testing
  - **Phase III**

Estrogen Detox: in Summary

We can obtain useful information from DUTCH and utilizing complementary stool testing to understand production and metabolism of Estrogen

This may help understand symptoms (PMS/mood changes/heavy periods/etc), as well as risk assessment for hormone cancers

As well as overall health