



## Medication & Drug Response (Sample Report)

| Trait  | Your Result        | Description   |
|--|--------------------|---|
| <b>Abacavir Hypersensitivity</b><br>(HIV Treatment) 1 in 20 risk of hypersensitivity | <i>Absent</i>      | Abacavir is a medication used to prevent and treat HIV/AIDS   |
| <b>Alcohol Dependence</b><br>(Alcohol Use)   | <i>Typical</i>     | A chronic disease characterised by uncontrolled drinking and preoccupation with alcohol                     |
| <b>Aromatase Inhibitor Side-Effects</b><br>(Breast Cancer Treatment)                 | <i>Higher</i>      | Aromatase inhibitors are a class of drugs used in the treatment of breast cancer in post-menopausal women   |
| <b>Cannabis Dependence</b><br>(Cannabis Use)   | <i>Lower</i>       | Cannabis, also known as marijuana, is a psychoactive drug   |
| <b>Carbamazepine Reaction</b><br>(Neuropathic Pain, Epilepsy Treatment)              | <i>Typical</i>     | Carbamazepine (or Tegretol) is an anticonvulsant used in the treatment of epilepsy and neuropathic pain     |
| <b>Citalopram Response</b><br>(Antidepressant)                                       | <i>Typical</i>     | Citalopram (Celexa) is an antidepressant used to treat Major Depressive Disorder and Obsessive-Compulsive D |
| <b>Cocaine Dependence</b><br>(Cocaine Use)   | <i>Much Higher</i> | Cocaine is a highly addictive drug associated with health issues and other problems                         |
| <b>Cyclophosphamide Reaction</b><br>(Chemotherapy)                                   | <i>Typical</i>     | Cyclophosphamide is a medication used as chemotherapy and to suppress the immune system                     |
| <b>Hepatitis C Treatment Response</b><br>(Hepatitis C Treatment)                     | <i>Lower</i>       | Hepatitis C is a virus that causes liver damage, and is often spread through the sharing of unclean needles |
| <b>Heroin Addiction</b><br>(Heroin Use)  | <i>Much Lower</i>  | Physical and psychological reliance on opioids  |
| <b>Inhaled Glucocorticoids Response</b><br>(Asthma Treatment)                        | <i>Typical</i>     | Inhaled Glucocorticoids act directly in the lungs to inhibit the inflammatory process that causes asthma    |
| <b>Metabolism of some medicines</b><br>(Anti-ulcer, Anti-platelet, Antidepressant)   | <i>Typical</i>     | Some people are poor metabolizers of common drugs such as Plavix, Omeprazole, Esomeprazole, etc             |
| <b>Metformin Response</b><br>(Type-2 Diabetes Treatment)                             |                    | Metformin (or Glucophage) is the first-line medication for the treatment of Type-2 Diabetes                 |
| <b>Nicotine Response</b><br>(Nicotine Use)   | <i>Typical</i>     | Nicotine is a highly addictive stimulant most commonly acquired through smoking cigarettes                  |
| <b>NSAID Response</b><br>(Inflammation, Fever, Pain Treatment)                       | <i>Sensitive</i>   | Non-Steroidal Anti-Inflammatory Drugs reduce pain, decrease fever, and decrease inflammation                |
| <b>Salbutamol Response</b><br>(Asthma Treatment, marketed as Ventolin)               | <i>Poorer</i>      | Salbutamol (or Ventolin) is a medication that opens up the medium and large airways in the lungs            |
| <b>Sorafenib Response</b><br>(Liver Cancer Treatment)                                | <i>Typical</i>     | Sorafenib is for the treatment of primary kidney cancer, and advanced primary liver cancer                  |
| <b>Statin Response</b><br>(Cardiovascular Disease Treatment)                         | <i>Typical</i>     | Statins are a class of lipid-lowering medications for people at high risk of cardiovascular disease         |
| <b>Warfarin Metabolism</b><br>(Anticoagulant) Slower requires lower dose             | <i>Slower</i>      | Warfarin (or Coumadin) is a medication that is used as an anticoagulant                                     |
| <b>Warfarin Sensitivity</b><br>(Anticoagulant) Elevated requires lower dose          | <i>Elevated</i>    | Warfarin (or Coumadin) is a medication that is used as an anticoagulant                                     |

The CYP2C9 gene influences how our body metabolizes anti-coagulant drugs such as Warfarin, and non-steroidal anti-inflammatory drugs (NSAID) such as Aspirin, Celebrex, Voltaren and Ibuprofen. Approximately 10% of people are poor metabolizers of such drugs. **Your CYP2C9 gene indicates you are a "Intermediate" metabolizer of drugs ssuch as Warfarin, Aspirin, Voltaren and Ibuprofen.**



# Your Drug Response Summary

Your genes play a significant role in how your body processes, or metabolizes, drugs and medications.

Enzymes in the liver are responsible for metabolizing many of the drugs and medications that we use, with the most common metabolizing enzymes being CYP2C9, CYP2C19, and CYP2D6, each of which has an associated gene. Around a quarter of all drugs in current clinical use are metabolized by one of those three enzymes.

Around 10% of people have genetic variants in those enzymes that make them poor metabolizers of some drugs, and another 30% of people are intermediate metabolizers.

| <b>Enzyme:</b>          | <b>CYP2C9</b>       | <b>CYP2C19</b> | <b>CYP2D6</b> |
|-------------------------|---------------------|----------------|---------------|
| Your Metabolism Result: | <i>Intermediate</i> | <i>Normal</i>  | <i>Normal</i> |
| Your Genotype:          | <i>*1/*2</i>        | <i>*1/*1</i>   | <i>*2/*2</i>  |

| <b>Example Drugs</b>    | <b>CYP2C9</b>                | <b>CYP2C19</b>               | <b>CYP2D6</b>             |
|-------------------------|------------------------------|------------------------------|---------------------------|
| Antidepressants:        |                              | <i>Citalopram (Celexa®)</i>  |                           |
| Cardiovascular Disease: | <i>Warfarin (Coumadin®)</i>  | <i>Clopidogrel (Plavix®)</i> |                           |
| Neuropathic Pain:       | <i>Celecoxib (Celebrex®)</i> |                              | <i>Codeine (Tylenol®)</i> |

| <b>Metabolism Result</b> | <b>Enzyme Level</b> | <b>Response to Standard Drug Dosage</b>  |
|--------------------------|---------------------|--|
| <i>Poor</i>              | Low Activity        | A poor-metabolizing enzyme has slow activity.  |
| <i>Intermediate</i>      | Reduced Activity    | An intermediate-metabolizing enzyme is less active than normal.                                      |
| <i>Normal</i>            | Normal Activity     | A normal-metabolizing enzyme generally breaks down the standard dose of a drug.                      |
| <i>Rapid</i>             | High Activity       | A rapid-metabolizing enzyme is very active, and may break down a drug before it can have any effect. |

| <b>VKORC1:</b> | <b>rs9923231</b> |
|----------------|------------------|
| Your Genotype: | <i>AG</i>        |

The protein encoded by the VKORC1 gene is the primary target of the commonly used anticoagulant drug warfarin (Coumadin®). Genotypes of VKORC1 and especially CYP2C9 have been found to be predictive for warfarin dosage requirements.