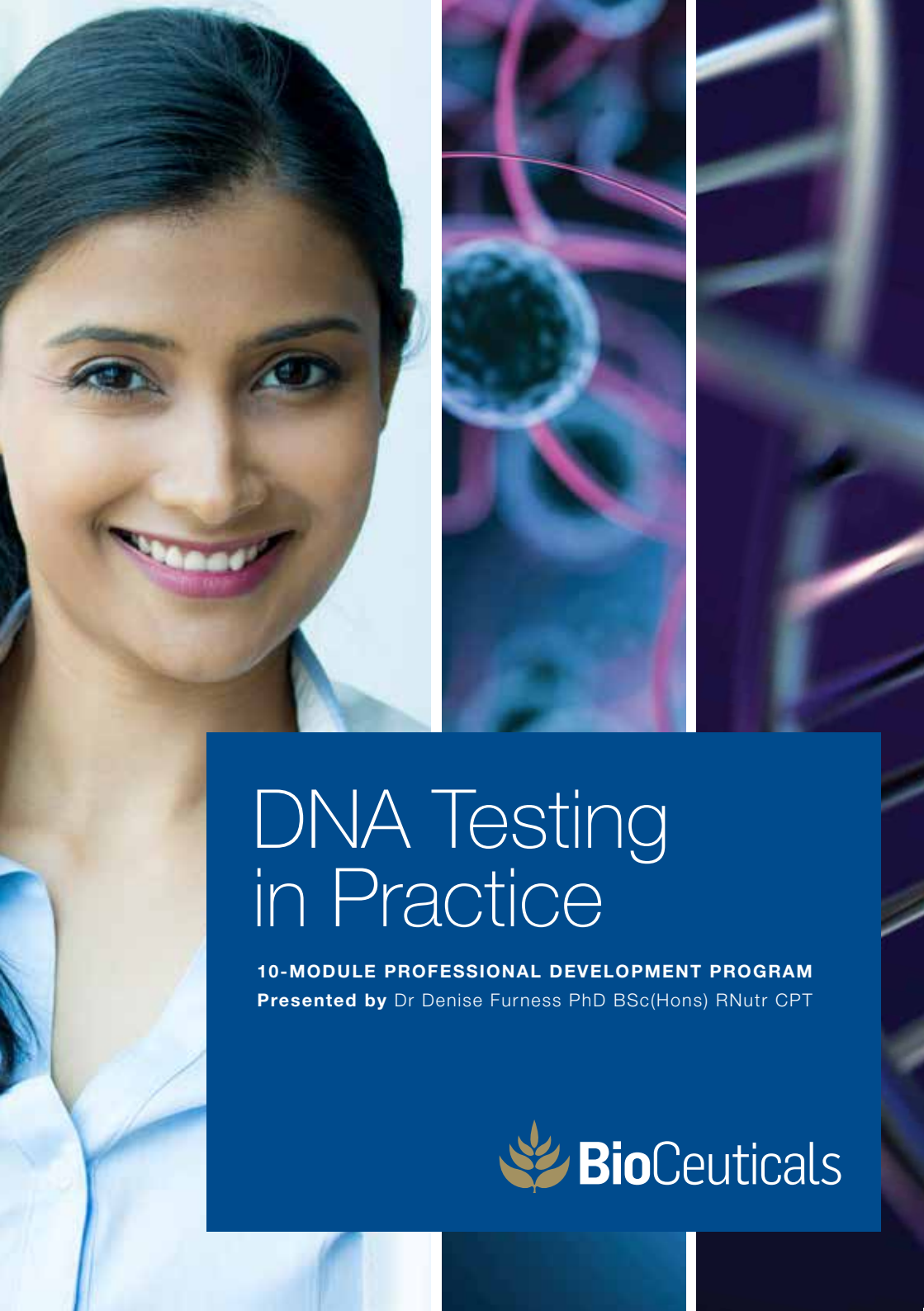

DNA Testing in Practice

10-MODULE PROFESSIONAL DEVELOPMENT PROGRAM

Presented by Dr Denise Furness PhD BSc(Hons) RNutr CPT

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A snapshot...

Of the subscription to the DNA Testing in Practice program:

- Access to complete online course (10 modules)
- 10 pre-recorded 90-minute modules
- Case studies and sample genetic test reports
- Free attendance to the BioCeuticals live events at ABC Studios in 2019 (Numbers are limited)
- Downloadable notes and gene/biochemical charts
- Quarterly audio interviews reviewing case studies and the latest research
- Access to the BioCeuticals DNA Testing in Practice Facebook discussion forum

DNA Testing in Practice

Features of the program

This immersive and interactive program with Dr Denise Furness, provides tangible and practical outcomes.

- Modules recorded at ABC Studios, Sydney for a high quality and engaging learning program
- Tailored treatment strategies involving genetic testing
- A Q&A forum where questions are collected and curated for use in exclusive sessions with Dr Denise Furness
- Sessions can be accessed any time, anywhere, with unlimited access to re-watch modules
- Online quizzes for revision and the ability to check learning outcomes, as well as earn CPD points
- Bonus quarterly audio interviews with Dr Denise Furness, discussing current research in nutrigenomics and practical implementation of findings that draw on Dr Furness' extensive experience
- Access to a private Facebook discussion forum where questions can be asked, cases can be discussed and information shared with Dr Denise Furness and other practitioner participants.

Program schedule

2019 RELEASE DATE	MODULE	BONUS MATERIAL
Monday 4 February	**1** Foundations of genetics	
Monday 4 March	**2** Interpreting genetic tests and delivering results to the patient	
Monday 1 April	**3** Nutrigenomics-related genes	Case study, sample report, audio interview
Monday 6 May	**4** Methylation, folate and B vitamin metabolism	Case study, sample report
Monday 3 June	**5** Hormones and fertility	Case study, sample report
Monday 1 July	**6** Detoxification	Case study, sample report, audio interview
Monday 5 August	**7** Oxidative stress and antioxidant systems	Case study, sample report
Monday 2 September	**8** Neurotransmitters, mood and cognition	Case study, sample report
Monday 7 October	**9** Immunity and inflammation	Case study, sample report, audio interview
Monday 5 November	**10** Cardiometabolic risks	Case study, sample report

DNA testing provided by CLINICAL SERVICES

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MODULE 1:

Foundations of genetics

Synopsis

By identifying specific gene variations, we can determine how a person's genes may influence their health. This helps practitioners understand why one person may respond favourably to a certain treatment while others may have a very different response. It gives practitioners the power to better tailor therapy and to choose the right nutrient, in the right form, at the right dose.

In order to take full advantage of the clinical opportunities genetic testing can offer, it is essential to set a solid foundation of understanding. This module provides clear insight into genetic variations and how they impact enzyme production and function, nutrient metabolism and transport, receptor site expression and disease risk. Strong focus is placed on key terms relating to genetics and biochemistry.

Topics covered

- DNA composition, DNA synthesis, amino acids and enzymes
- Different genetic variations that influence nutrient requirements and health, such as SNPs, insertions/deletions and copy number variations (CNVs)
- Basic terminology associated with genetic testing and reporting
- Genotyping and related technology
- Using DNA testing to enhance clinical decision making
- Privacy and insurance implications.

Learning objectives

- Demonstrate an understanding of key terminology associated with genetic testing and reporting
- Explain how personalised medicine can lead to more effective treatment strategies and better health outcomes
- Delineate the differences between nutrigenomics, nutrigenetics and epigenetics
- Explore transcription and translation
- Elucidate the impact of gene variations and how these can be addressed in clinic
- Learn how to determine which patients might benefit from genetic profiling
- Understand what additional tests to consider in order to maximise genetic results.

MODULE 2:

Interpreting genetic tests and delivering results to patients

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Synopsis

As we gain a better understanding of the impact specific gene variations may have on function and disease risk, we start to appreciate the value of a more personalised approach to treating individuals. However, when discussing genetic test results with a patient, it is essential to ensure we are properly armed with tools that ensure this information is well founded and delivered in a clear and appropriate manner.
This module covers critical considerations when delivering genetic information to your patients.

Topics covered

- Your genes are not your destiny – the role of diet, environment and lifestyle
- Assessing and conveying risk
- The importance of evidence and research-based SNPs
- Determining the level of impact of SNPs – the role of functional pathology
- Designing tailored treatment strategies based on gene test results
- Interpreting genetic test reports

Learning objectives

- Understand how to navigate genetic test reports and interpret gene variation results
- Explain the differences between clinical genetics and nutrigenomics
- Learn how to identify and convey critical genetic information
- Understand how to contextualise genetic reports in relation to clinical presentations and pathology results
- Learn the ways that genetics can best be utilised in a clinic setting
- Recognise how genetic information can impact patients and influence their behaviour
- Demonstrate how to effectively deliver genetic information to patients
- Become familiar with nutrigenomic/genetic profiling test results.

MODULE 3:

Nutrigenomic-related genes

Synopsis

When it comes to nutritional requirements, there is significant variability amongst individuals. Differences in absorption, metabolism, receptor function and excretion mean that every person has individual and specific needs. Inherited differences in the activity of enzymes and other functional proteins also contribute to variations in nutritional requirements.

This module examines specific gene variants (SNPs) involved in important aspects of nutrient metabolism, including enzyme and receptor function, in order to effectively target nutritional recommendations.

Topics covered

- Enzyme function and structure
- Receptor function and structure
- Nutrient transporters and cofactors
- Fat-soluble nutrients and transporters
- Vitamin B12 and folate absorption and transport
- Vitamin C transport and antioxidants (vitamin C, CoQ10, glutathione) synthesis and utilisation
- Vitamin D metabolism, transport and receptor function
- Glutathione metabolism and function
- Case study with sample of report.

Learning objectives

- Describe the impact of specific SNPs associated with nutrient levels including vitamins A, B12, C, D and folate
- Recognise the critical role of specific nutrient and mineral enzyme cofactors in relation to gene variations
- Understand the specific SNPs associated with nutrient transport
- Identify how endogenous antioxidants are impacted by SNPs and the influence this has on oxidative stress, inflammation and risk of disease
- Apply effective clinical nutritional strategies based on individual genetic requirements.

Module 4:

Methylation, folate and B vitamin metabolism

Synopsis

Methylation is the process by which the body transfers single carbon groups (methyl groups) to a series of amino acids, proteins, enzymes and DNA. It occurs in every cell in the body, billions of times every second and plays a critical role in gene expression, DNA synthesis and repair, detoxification, hormone metabolism, immune cell function, energy production, cell membrane function, neurotransmitter production, metabolism and weight management.

Disruptions in methylation can have profound effects on health and increase the risk of developing a number of chronic conditions including diabetes, depression, cardiovascular disease, reproductive issues, cancer and cognitive dysfunction.

While dietary and lifestyle factors play an important role in influencing normal methylation, the presence of specific gene variants can have significant impacts. Having an in-depth understanding of methylation-related genes and how patients with specific SNPs can be supported is, therefore, an important clinical skill.

This module reviews how to personalise treatment strategies based on SNPs associated with methylation.

Topics covered

- The methylation cycle and the role of methylation
- Folate metabolism, enzymes, nutrient cofactors and the impact of genetic variations
- Homocysteine-methionine metabolism, enzymes, nutrient cofactors and the impact of genetic variations
- Vitamin B12 absorption and transport and the impact of genetic variations
- Transsulfuration pathway, enzymes, nutrient cofactors and the impact of genetic variations
- Using methylation pathways to optimise biochemistry and cell function
- Case study with sample report

Learning objectives

- Describe the methylation cycle and the functions that depend on this process
- Understand how SNPs affect methylation, homocysteine, folate and other B vitamins
- Examine critical enzyme cofactors required for methylation
- Identify important conditions that may be affected by an imbalance in methylation
- Recognise the numerous factors known to influence or alter methylation
- Understand the impact of SNPs associated with folate metabolism, homocysteine-methionine pathway, vitamin B12 absorption and transport, and transsulfuration
- Select appropriate nutrient forms based on genetic results and presenting symptoms
- Build effective clinical strategies for patients based on their individual genetic variations.

MODULE 5:

Hormones and fertility

Synopsis

Hormone and fertility issues are more commonplace today than ever before. It is estimated that as many as one in six couples experiences problems with infertility and that 10-25% of all clinically recognised pregnancies end in miscarriage.

Hormone and reproductive wellness results from a strong relationship between genes and environment requiring a holistic approach that accounts for metabolic, immunological, infectious, psychological and dietary factors.

This module is designed to provide an in-depth examination of how genes impact hormone metabolism, fertility and pregnancy health. In order to properly address these issues, it is important to consider gene variants associated with hormone detoxification and clearance, thyroid function, methylation, inflammation, oxidative stress and nutrient requirements.

Topics covered

- Factors affecting hormone and reproductive health
- Key SNPs that can influence hormone balance and fertility
- Hormone receptors, thyroid function and the impact of related SNPs
- Phase 1 detoxification and CYP SNPs
- Phase 2 detoxification, cofactors and genetic polymorphisms
- The role of methylation-related genes
- Oxidative stress and the role of antioxidant-related genes with hormone metabolism and fertility
- Genetic factors associated with blood pressure and blood clotting
- Case study with sample report.

Learning objectives

- Identify the endogenous and environmental factors that impact hormone and reproductive health
- Examine gene variants related to male and female fertility issues
- Understand the functional role of key enzymes and their cofactors and how genetic variations impact hormone metabolism
- Review the role of methylation and oxidative stress on fertility
- Describe the impact of methylation and antioxidant associated genes on endocrine health
- Develop effective therapeutic strategies that account for individuality, exposures and lifestyle.

Module 6:

Detoxification

Synopsis

In today's world, it is impossible to escape the impact of environmental toxins. They are in the air we breathe, our food, homes and our workplaces. While our bodies are normally efficient at dealing with a considerable toxic load, there are limits. When these limits are reached, not only is the ability to detoxify environmental chemicals compromised, but the capacity to properly process endogenous toxins and metabolites is also affected.

It's also important to note that the ability to detoxify varies from person to person, depending on their genetic traits. We know that certain gene variants can affect detoxification enzymes and pathways, compromising our ability to effectively process and remove a wide range of compounds.

Understanding the implication of SNPs associated with phase 1 and 2 detoxification can help identify which toxins are most harmful, which may be difficult to clear and which should be completely avoided. This module delves into the critical SNPs associated with impaired liver detoxification and explores how nutritional deficiencies, stress, infection and inflammation can exacerbate the symptoms of toxicity, setting the foundation for how this can be best managed clinically.

Topics covered

- Sources of toxicity and managing toxic burdens
- Liver detoxification pathways, enzymes and cofactors
- Relationships between gene polymorphisms and detoxification
- Detoxification capacity and response variability
- SNPs associated with detoxification enzymes and pathways
- Clinical strategies – personalising which toxins are the worst and most important to avoid
- Restoring, managing and augmenting detoxification systems.

Learning objectives

- Identify the primary metabolic processes that regulate liver detoxification and the effect of SNPs on those pathways
- Critically assess environmental and endogenous exposures
- Understand the functional roles of phase 1 and 2 enzymes and how genetic variants impact detoxification
- Understand individual gene profiles in order to prioritise which toxins and drugs to avoid
- Discover how to optimise the metabolic biochemistry needed for detoxification as well as the enzymes and transporters that work with it
- Learn how to target specific nutrients at gene promoter regions to switch on detoxification, transport and antioxidant functions
- Build effective clinical strategies for detoxification support based on individual genetic variations.

MODULE 7:

Oxidative stress and antioxidant systems

Synopsis

Free radical production is a normal outcome of metabolism and is typically managed by the endogenous antioxidant system, along with dietary antioxidants that play a decisive role in the prevention of oxidative damage. However, an imbalance between the production of free radicals and their elimination by antioxidants can lead to inflammation and the development of chronic disease.

While diet is an important source of antioxidants, it is our endogenous antioxidant system that plays a primary role in managing the balance of reactive oxygen species (ROS). This system is largely composed of enzymes including manganese superoxide dismutase (MnSOD), catalase (CAT) and glutathione peroxidase (GPX-1), and is expressed when factors such as Nrf2 are activated.

Growing evidence of an association between specific genetic variants and oxidative stress biomarkers indicate a functional impact of these SNPs on corresponding antioxidant enzymes.

This module expands the understanding of the role of exogenous and endogenous antioxidants and assesses the impact of SNPs on clinical and biochemical presentations.

Topics covered

- Endogenous antioxidant systems
- Genetic polymorphisms of antioxidant enzymes
- Role of Nrf2 in oxidative stress
- Dietary antioxidants – function and clinical considerations
- Selection of appropriate nutrients based on specific genetic test results
- Effective clinical strategies for patients based on individual genetic variations.

Learning objectives

- Understand an individual's antioxidant status in the context of their genetic profile
- Examine how specific ROS might be contributing to inflammation and cellular damage based on the genetic profile
- Discover methods for upregulating Nrf2 and endogenous antioxidant systems
- Learn to support specific endogenous antioxidants with cofactors and phytochemicals
- Discern other genetic and biochemical factors that may contribute to oxidative stress
- Build effective clinical strategies for patients based on their individual genetic variations.

Module 8:

Neurotransmitters

Synopsis

Genetics may influence the way individuals think and feel. Various processes in the body, such as the methylation cycle, neurotransmitter production and nutrient metabolism, may contribute to mood disorders and cognitive decline.

Understanding how genes may impact neurotransmitter and neurotrophic factor metabolism can help identify key contributing factors for depression, anxiety, mood disorders and cognitive decline.
These insights are enhanced with the appreciation of the profound relationship of neurotransmitters and the methylation process.

This module examines the genetic links associated with the biochemical and metabolic pathways that contribute to dopamine, serotonin, histamine, GABA, biopterin, phosphatidyl choline, BDNF and omega fatty acids production, along with corresponding nutrient requirements.

Topics covered

- Influence of genetic variants on neurotransmitters, mood and cognition
- Genetics of fatty acid metabolism and brain function
- Relationship between neurotransmitters and methylation
- Role of BDNF and the impact of associated SNPs
- Other genetic factors that affect mood and cognition – antioxidant systems, inflammatory markers, nutrient metabolism
- Nutrient and cofactor requirements required for normal brain function and development
- How the gene, diet and environment influence key biochemical pathways associated with brain and neurotransmitter function
- Personalised treatment strategies using genetic testing

Learning objectives

- Understand neurotransmitter synthesis and the role nutrient cofactors and phytonutrients
- Look at how certain SNPs impact mood and cognition and explore the affected biochemical pathways
- Examine the relationship between genes, diet and environment and how this can be managed to achieve optimal mental health
- Assess and address genetic vulnerabilities and metabolic abnormalities that may contribute to changes in mood and cognition
- Identify new treatment opportunities based on personalised genetic profiles
- Develop targeted and personalised treatment strategies for improved health outcomes.

MODULE 9:
Immunity and inflammation

Synopsis

Accumulating evidence indicates that alterations in immune function can be associated with a number of specific genetic variants. These SNPs have been shown to influence a range of immune markers and pathways increasing the risk of inflammatory disorders and immune dysfunction.

This module identifies key immune-related genes and explores how certain genetic polymorphisms are associated with an increased risk of inflammation and pathogenesis. Genes associated with eicosanoid metabolism, cytokine function and immune signalling are explored to determine related risks and treatment considerations.

Topics covered

- Cytokines, eicosanoids and other immune markers
- SNPs associated with altered immune traits, inflammation and disease risk
- The interaction between environmental factors and immune-related genes
- Assessing disease risk.

Learning objectives

- Understand the genetic contribution to varying immune responses among individuals and its consequences on immune-mediated diseases
- Assess genetic and environmental risk factors for immune-mediated disorders
- Interpret genetic tests for the management of chronic inflammation
- Develop personalised clinical strategies for the management and prevention of gene-associated immune risks.

Module 10:
Cardiometabolic risk

Synopsis

Cardiovascular disease (CVD) and type 2 diabetes represent two of the biggest challenges confronting Australia's health system. Evaluation of the risk factors for these disease states comes with substantial overlap, recognised as cardiometabolic risk, and collectively represents a common complex disorder with a strong genetic component.

Over the past few years, genetic and genomic studies have provided invaluable evidence linking specific gene variants to alterations in adiposity, blood pressure, DNA methylation, insulin function, inflammation, lipoproteins and nutrient metabolism as well as further relationships with disease risk.

This module assesses the current understanding of these disease risk factors and identifies key genetic contributors to uncover targeted treatment considerations.

Topics covered

- Cardiometabolic diseases and related complications
- Environmental and genetic factors that contribute to cardiometabolic disorders
- Assessing cardiometabolic risk alongside cardiometabolic-related gene SNPs
- The role of inflammation and oxidative stress in cardiometabolic disease
- Nutrition, cofactors and phytonutrients.

Learning objectives

- Review the combination of metabolic dysfunctions that characterise cardiometabolic diseases
- Assess the multiple interacting, environmental and genetic factors that contribute to cardiometabolic disorders
- Interpret genetic test results to assess cardiometabolic risk
- Identify the numerous cofactor and nutritional requirements associated with cardiometabolic-related gene SNPs
- Develop personalised clinical strategies for the management and prevention of gene-associated cardiometabolic risks.

DNA Testing in Practice

10-MODULE PROFESSIONAL DEVELOPMENT PROGRAM

Registration Form

SEMINAR DETAILS	
Time	February – November 2019
Dates	☐ **Session 1:** 12 December 2018 ☐ **Session 2:** 13 February 2019 ☐ **Session 3:** 10 April 2019 ☐ **Session 4:** Date TBC
Cost	☐ $799 incl. GST (full price) ☐ $699 incl. GST (student rate) ☐ $699 incl. GST (lecturer rate) ☐ Monthly payment plan: $85 each month for 10 months* (does not include access to live studio sessions)
Please note	Paid upfront options include attendance to the BioCeuticals live events at ABC Studios, Sydney. Please register your interest for each. Numbers are limited.

There are no refunds on monies paid.

†A copy of student ID (or letter of employment for lecturers) must be emailed with attention to Dannielle Newham at Dannielle.Newham@bioceuticals.com.au or faxed to (02) 9080 0940.

*Subscribers who select the monthly payment plan acknowledge and agree that by doing so BioCeuticals is authorised and directed to deduct each monthly instalment from the credit card specified below. It is a fundamental condition that if any monthly instalment(s) is dishonoured on the due date(s), the balance of the non-discounted cost of $799 shall immediately become due and payable by the subscriber and BioCeuticals may take such action as it determines to recover the same from the subscriber.

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10-MODULE PROFESSIONAL DEVELOPMENT PROGRAM

Presented by Dr Denise Furness PhD BSc(Hons) RNutr CPT

Dr Denise Furness is a molecular geneticist, registered nutritionist and fitness professional. She conducted her PhD at CSIRO Human Nutrition and postdoctoral fellowship with the University of Adelaide investigating folate nutrigenomics, methylation and DNA damage in relation to pregnancy outcomes. She has won numerous awards for her research and published her work in peer reviewed medical and nutrition journals. In 2012 Denise shifted from an academic research position to a consulting role, founding Your Genes and Nutrition helping practitioners and patients understand the role of nutrigenomics and genetic testing in relation to various health outcomes. In particular, her focus is on the diagnosis and treatment of underlying triggers such as inflammation, oxidative stress and methylation. Denise regularly presents at conferences and conducts educational seminars and workshops discussing gene-environment interactions and how these impact on our health throughout all the stages of the life cycle.

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The age of personalised medicine has arrived with BioCeuticals Clinical Services DNA testing. Now you have the ability to identify specific gene variations allowing you to personalise nutritional, supplemental and lifestyle protocols for patients based on their individual genetic profile.

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