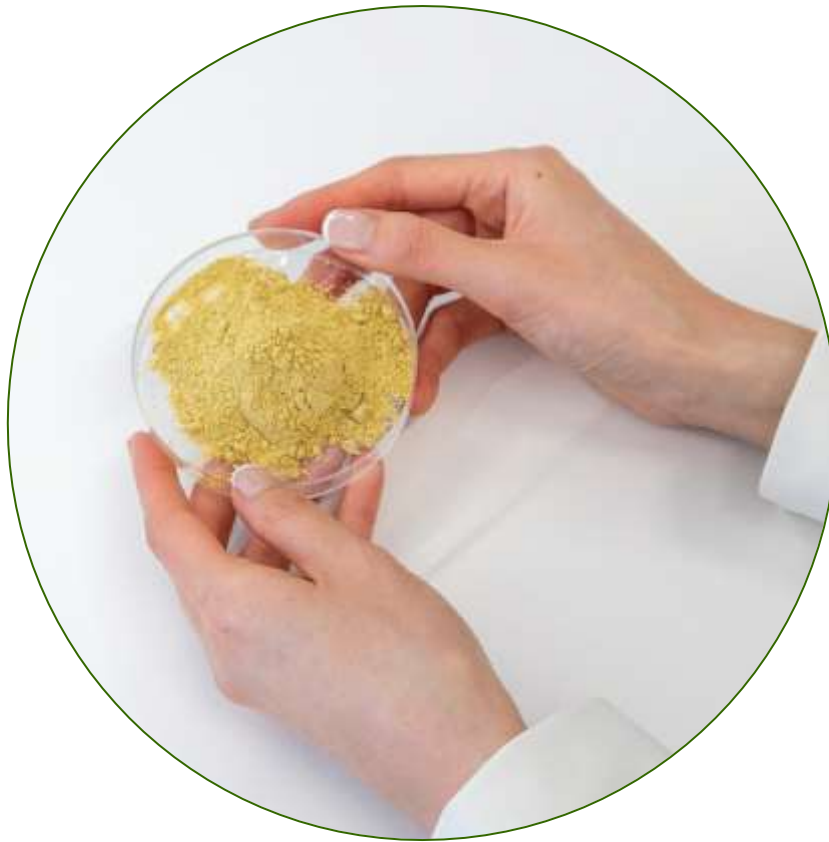




Feiolix.

Blood glucose management



Type II Diabetes and Prediabetes

Number of adults (20–79 years) with diabetes worldwide

North America & Caribbean



- 1 in 6 adults in this Region is at risk of type 2 diabetes
- 43% of global diabetes-related health expenditure occurs in this Region

South & Central America



- 2 in 5 people with diabetes were undiagnosed
- Only 9% of global diabetes-related health expenditure for diabetes is spent in this Region

Africa



- 3 in 5 people with diabetes are undiagnosed
- 3 in 4 deaths due to diabetes were in people under the age of 60

Middle East & North Africa



- 1 in 8 people have diabetes
- 1 in 2 deaths due to diabetes were in people under the age of 60

South-East Asia



- 1 in 5 adults with diabetes lives in this Region
- 1 in 4 live births are affected by hyperglycaemia in pregnancy

WORLD



Europe



- 1 in 6 live births are affected by hyperglycaemia in pregnancy
- The Region has the highest number of children and adolescents (0–19 years) with type 1 diabetes – 297,000 in total

Western Pacific



- 1 in 3 adults with diabetes lives in this Region
- 1 in 3 deaths due to diabetes occur in this Region

For every 1 person with T2DM, another 3 are prediabetic



¹International Diabetes Federation .2019, 7 (1), 25-33.

Type II Diabetes: Primary biology

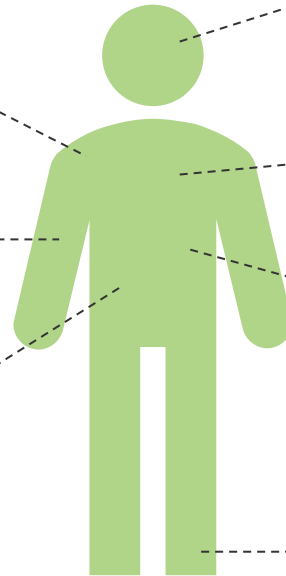
- Inflammatory disease
- Characterised by
 - Decreased insulin production by β cells on the pancreas
 - Decreased sensitivity to insulin
- Glucose from the diet is not absorbed efficiently into skeletal muscle from the blood
- Increased average blood glucose levels
- Haemoglobin protein in the blood becomes glycosylated
- Measured as **HbA1c**
- Indicative of average blood glucose over previous ~3 months

T2DM has systemic consequences

Susceptibility to
Infections

Limb Necrosis
& Amputation

Nephropathy
(Kidneys)



Blindness

Blood Pressure
(Vasculature)

Visceral
Weight Gain

Neuropathy
(Nerves)

“What’s good for diabetes is
good for overall health.”

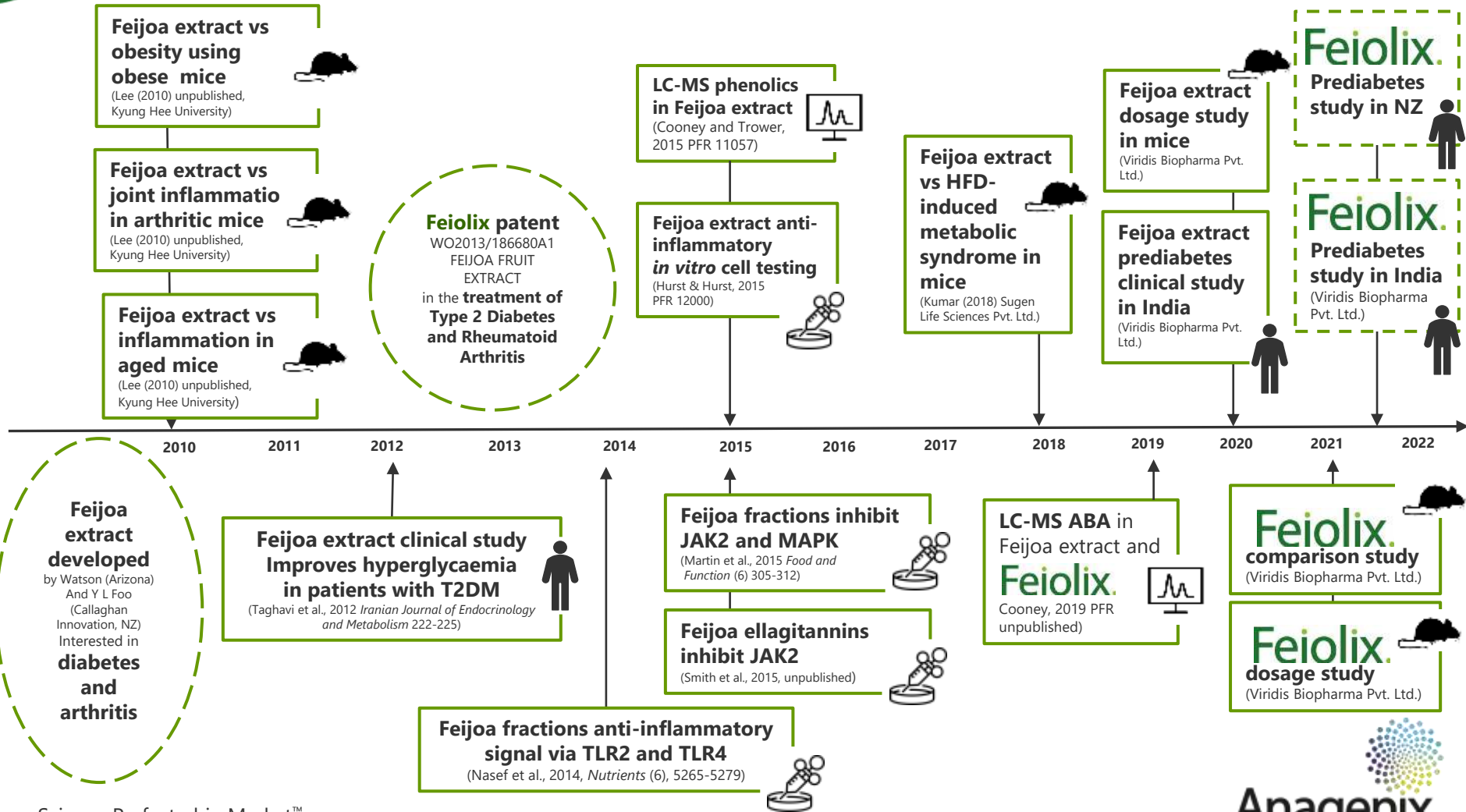
- Dr. Peter Attia

Feiolix.

- Whole NEW ZEALAND Feijoas
- High levels of
 - **Anti-inflammatory** polyphenols
 - **Blood glucose-lowering** Abscisic Acid (ABA)
 - **Satiating** dietary fibre
- Clinically significant **reduction** of **weight gain** and **blood glucose**.



Feiolix. A decade in the making



Feiolix. Conception

Polyphenol experts Dr Yeap Foo (Callaghan Innovation, NZ) & Prof. Ron Watson (University of Arizona, USA)

Discovered chemical extract of feijoa fruit high in **anti-inflammatory** hydrolysable tannins



Obesity

- Leptin-deficient (LD) mice become obese (16 wks)
- LD mice fed feijoa extract **gained 24% less weight**



Rheumatoid arthritis

- As effective as methotrexate at
 - Increasing running speed and foot pressure
 - **Decrease in inflammatory cytokines**
 - TNF- α , IL-2
 - Interferon- γ (IFN- γ)



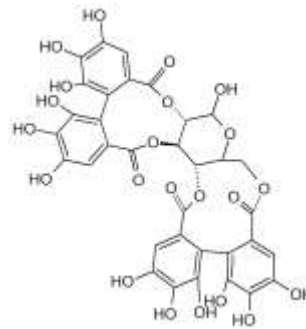
Inflammation

- **Decrease** in pro-inflammatory cytokine interleukin-4 (IL-4)
- **Decrease** in tumour necrosis factors α and β (TNF- α and TNF- β)

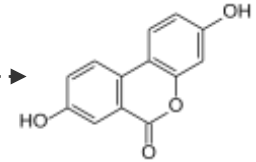
Feiolix. Bioactive Polyphenols

Feiolix contains anti-inflammatory POLYPHENOLS

- Hydrolysable tannins (ellagitannins)
 - α and β -pedunculagin
 - ~60% of the total polyphenols



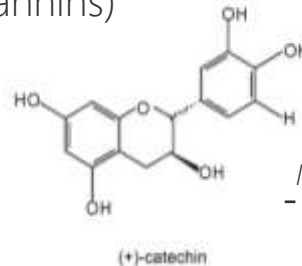
Microbial transformation



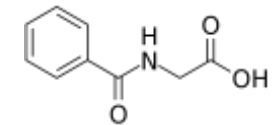
Urolithins

- Anti-inflammatory
- Insulin secretagogue

- Flavans
 - Proanthocyanidins (condensed tannins)
 - Catechin & Catechin B2
 - Gallocatechin
 - Epicatechin
 - Same polyphenols as green tea



Microbial transformation



Hippuric acid

- Anti-inflammatory

The common underlying mechanism of obesity, arthritis and diabetes is inflammation



Clinical Trial: Feijoa extract

Feijoa extract **decreased blood glucose and HbA1c in type 2 diabetics**

- Randomised, double-blind, placebo-controlled, n = 20, Pilot Study (2014)
- Significant ($P < 0.05$) decrease in fasting blood glucose and haemoglobin A1c (HbA1c)
 - **Magnitude of decrease** seen with HbA1c ($\downarrow 0.86$) is **CLINICALLY SIGNIFICANT**
 - Pharmaceuticals for diabetes treatment are approved with changes of > 0.5 .
- Trending decreases in
 - Triglycerides ($P = 0.0127$)
 - Total cholesterol ($P = 0.0887$)
 - LDL ($P = 0.157$) levels
 - Systolic blood pressure ($P = 0.0776$)

Feijoa extract vs fat-induced diabetes



Feijoa extract **improved symptoms**
in high fat diet-induced **diabetic mice**
over 12 weeks

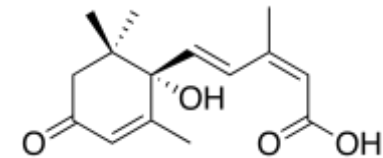
- Decreased weight gain and fasting blood glucose
- Improved fasting insulin, insulin response and insulin resistance (HOMA-IR)
- Improved oral glucose tolerance test (OGTT) and insulin tolerance test (ITT)
- **Reduced** non-esterified fatty acids, total cholesterol and triglycerides

Feiolix. Abscisic acid

A KEY BIOACTIVE EXPLAINING HOW Feiolix. CONTROLS BLOOD GLUCOSE

Feiolix contains high levels of Abscisic Acid (ABA)

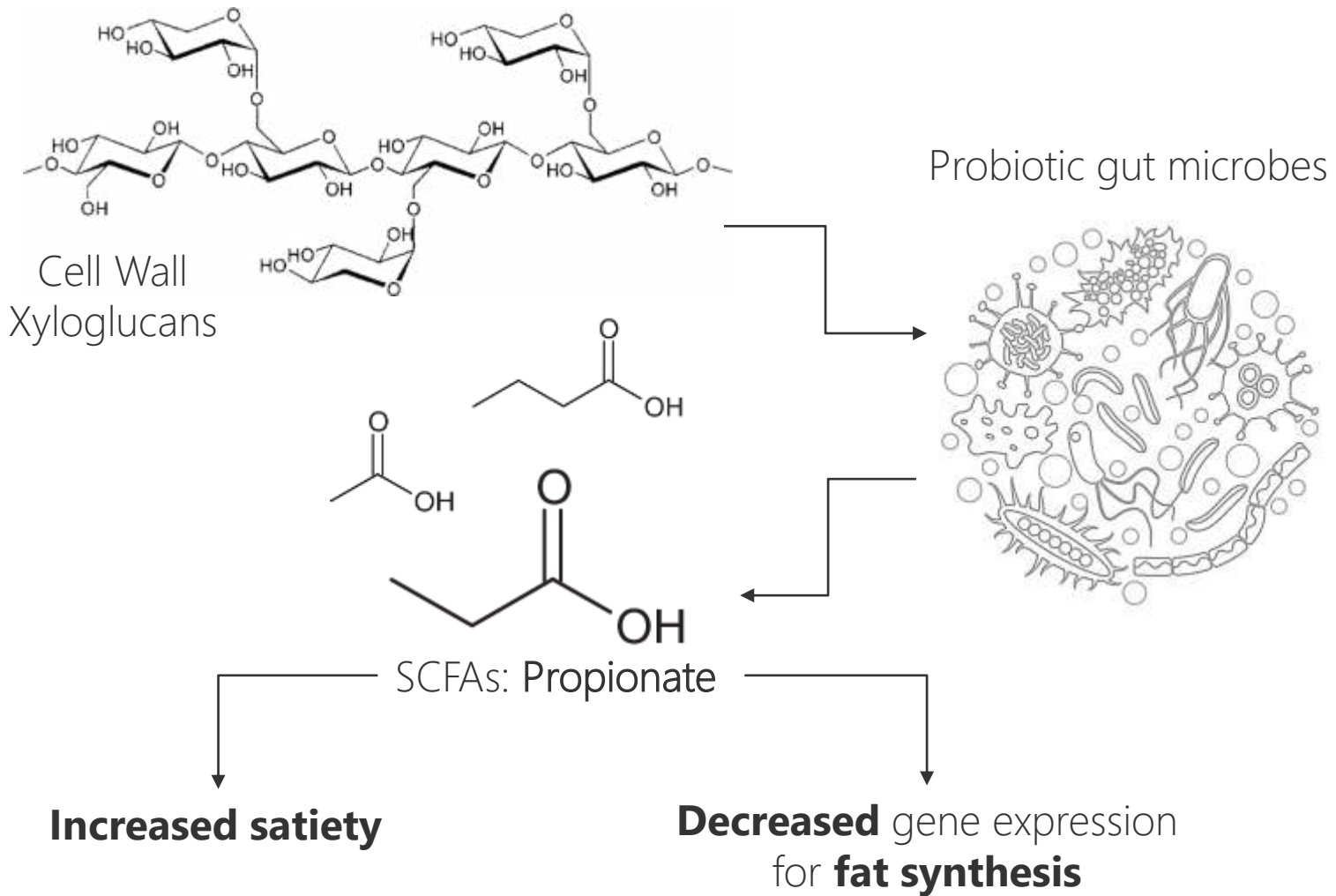
- Universal signalling hormone
 - Separation of fruit from stem in plants
 - Co-secreted with insulin by humans at low levels
 - Still functional in diabetics
- Binds to ABA receptor (LANCL2) in humans
 - Stimulates insulin secretion
 - Stimulates glucose absorption
 - Stimulates GLP-1 secretion



Food product	ABA level (mg/kg)
NZ Feijoas	4.29
Avocados	2.0
Citrus	1.25
Soybean	0.79
Fig	0.72
Bilberry	0.4
Maize	0.33
Apricot	0.32
Apple	0.30
Tomato	0.20

1. Zocchi et al., (2017) Abscisic acid: a novel nutraceutical for glycemic control. *Front Nutr.* 4:24.
2. Bassaganya-Riera et al., (2010) Mechanisms of action and medicinal applications of abscisic acid. *Curr Med Chem.* 17 (5), 467-478.
3. Bassaganya-Riera et al., (2011) Abscisic acid regulates inflammation via ligand-binding domain-independent activation of peroxisome proliferator-activated receptor gamma. *J Biol Chem*, 286 (4), 2504-2516.

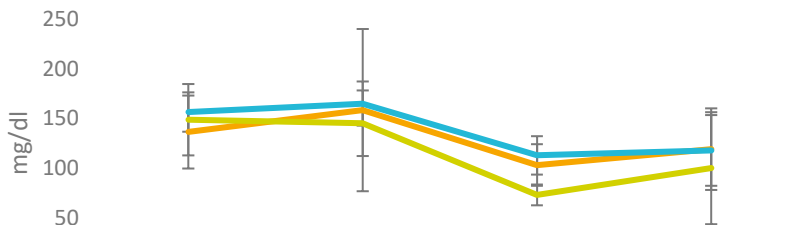
Feiolix. Dietary fibre



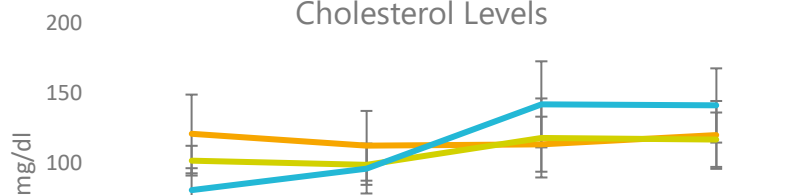
Feiolix. Whole Fruit vs Extract



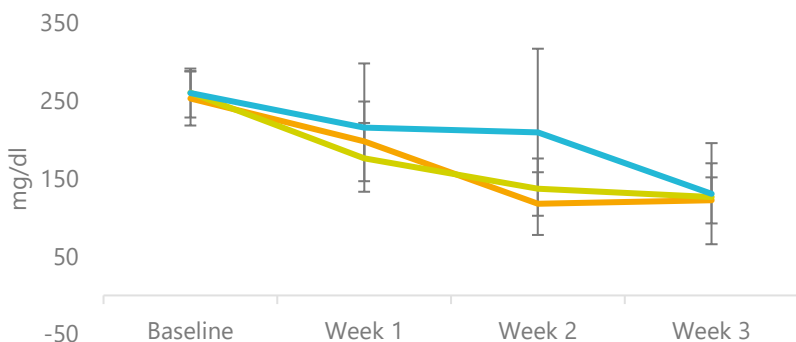
Triglyceride Levels



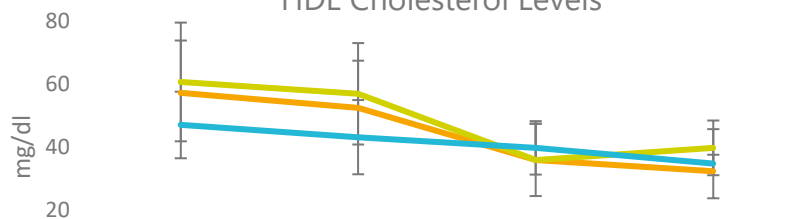
Cholesterol Levels



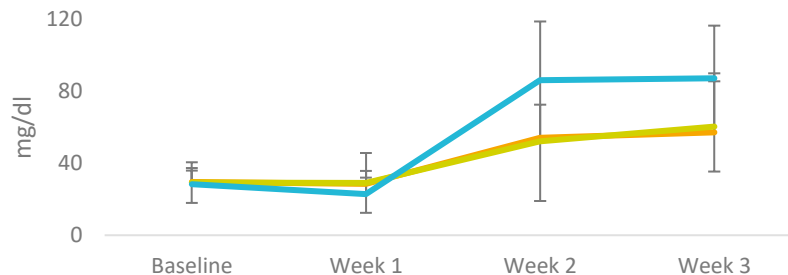
Fasting Blood Glucose



HDL Cholesterol Levels



LDL Cholesterol Levels



- High Dose Powder
- Low Dose Powder
- Extract

Feiolix. Innovation Award 2021



Proprietary processing of the feijoa into a **cost-effective** and **saleable** product that **retained** the health benefits



Anagenix announced winner of 2021 Cawthron Innovation Award

28 May 2021



Feiolix. Upcoming studies

HIGH-VALUE
NUTRITION

Ko Ngā Kai
Whai Painga

National
SCIENCE
Challenges



- Synergy Study
n= 30, 2 weeks, residential whole diet intervention, multi-omics
- Single product sub-study
n= 30, 1 day, post-prandial thermogenesis



- Dosing study (700 mg/day)
- Pilot study (2.4 g/day)
- Human dosing study





Feiolix. Patented

WO2013/186680A1 FEIJOA FRUIT EXTRACT in the treatment of Type 2 Diabetes and Rheumatoid Arthritis

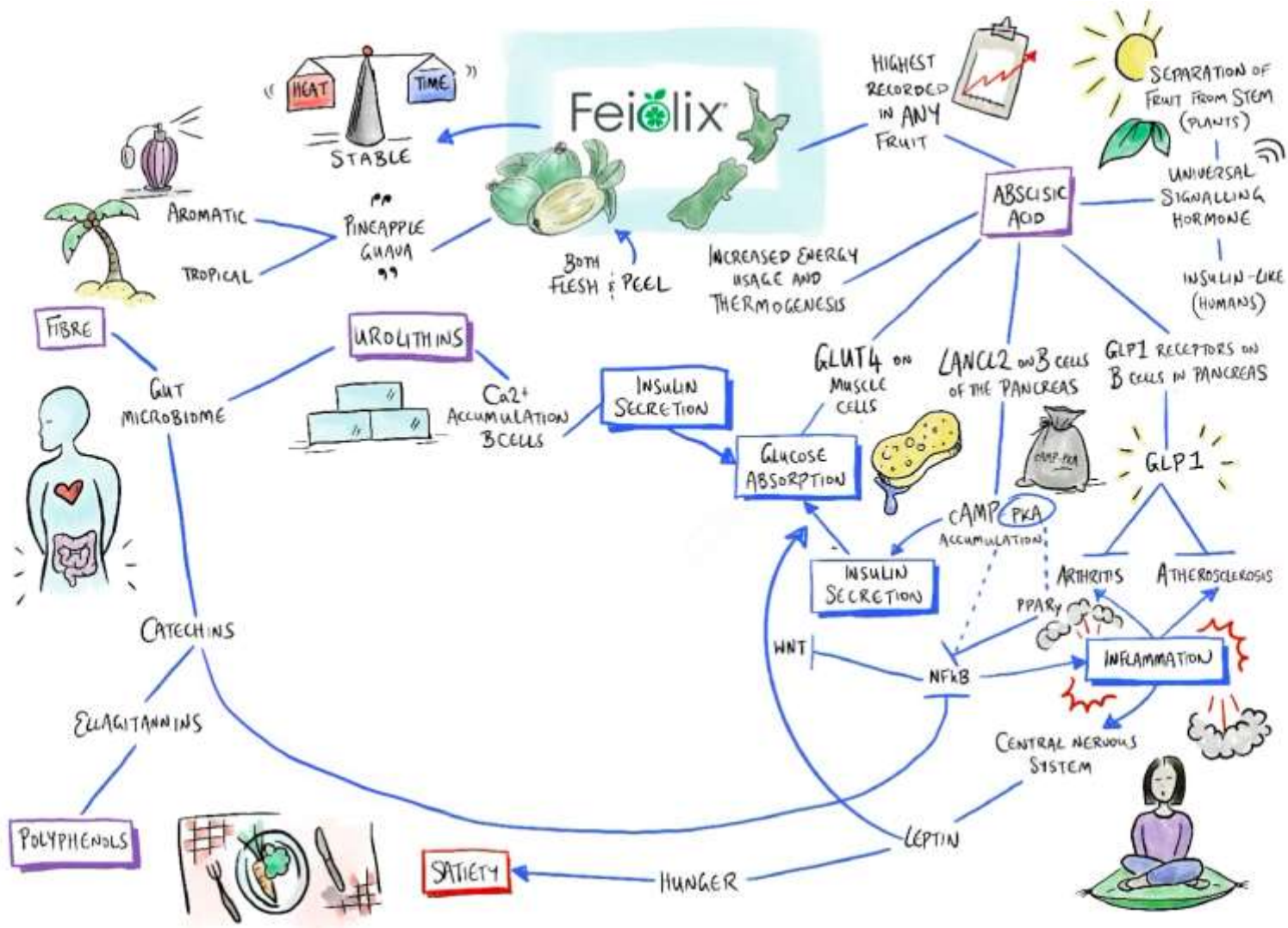
Claims summary:

1. A method of **lowering serum lipids** in a patient...
2. A method of **lowering serum glucose** in a patient...
3. A method according to claim 2 wherein **HbA1c is reduced**...
4. A method of **lowering blood pressure**...
5. A method of ameliorating the symptoms of metabolic syndrome...
6. A method of preventing or **reducing obesity**...
7. A method of **regulating immune function**...
8. A method of treating a disease or disorder associated with **immunosenscence**...
9. A method according to any one of the preceding claims wherein the patient has **type 2 diabetes**...
10. A method of ameliorating the **symptoms of diabetes**...
11. A method of treating or preventing the symptoms of **rheumatoid arthritis**...



Feiolix. Regulatory

- ✓ Heat stable
- ✓ Known mechanisms of action
- ✓ Validated by preclinical and clinical evidence
- ✓ Self-Determined GRAS
- ✓ 100% non-GMO feijoa fruit
- ✓ Dairy free, gluten free, preservative free
- ✓ Comprehensive specifications including microbes and heavy metals
- ✓ Quarterly quality assurance programme including pesticides screen (300+)





Feiolix.
Blood Glucose Management

