THE GENOMIC KITCHEN

Introducing Master Ingredients

The Genomic Kitchen M.I.S.E

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Group of ingredients that influence our master genes. They can help extinguish fire (inflammation) in the body or reduce the sparks that ignite fires (inflammation).

INFLUENCER INGREDIENTS
A group of ingredients containing nutrients that support essential biochemical pathways which deeply influence health outcomes.

SUPERFOODS
A selective group of diverse nutrient ingredients needed to support the many functions of the proteins that our genes make. Proteins need support. Without supporting vitamins and minerals, they simply cannot do their work. They are in effect, like chefs without their hands.

THE ENABLERS
The gut is the soil of your body. Without a healthy gut, you cannot absorb the nutrients and bioactives from the food you eat, so your genes have nothing to work with. Enablers help SEED and FEED the gut, enabling the absorption of nutrients and bioactives that talk to genes.

WHAT ARE MASTER INGREDIENTS?

A group of ingredients that influence “master genes” in the body. These master genes can significantly impact how we…

- Manage inflammation and damage to the body
- Support detoxification
- Handle blood sugars
- Handle fat

Meet the Master Genes

Master Gene 1:

NrF2: The Fire Extinguisher

Master Genes 2 & 3

TNF-Alpha & NfkB: The Fire Igniters

Master Gene 4

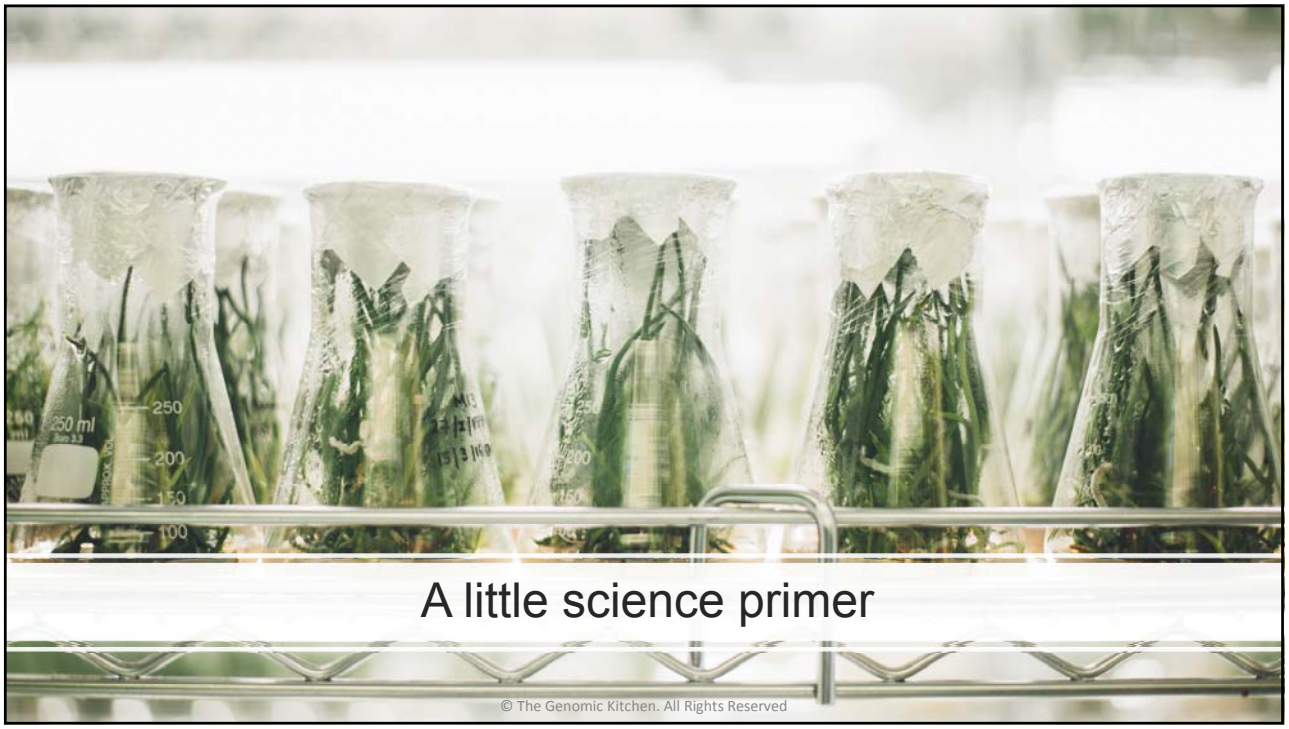
SIRT-1: Master of the metabolic universe

Quick recap

- Genes are our blueprint for life
- A gene is a distinct stretch of DNA that determines something about who you are
- Genes manage the orchestra of life by making proteins
- Each gene is essentially a recipe for a making a certain protein
- Proteins build, regulate and maintain the human body
- Examples of how proteins work: become bone, muscle, a hormone Proteins are the fabric of our body

What we focus on at The Genomic Kitchen

- Bioactive-rich ingredients
- Nutrient-rich ingredients
- Ingredients that support our gut
- Flavor-forward food
- Simple meals you can make without a cookbook



A little science primer

About Bioactives

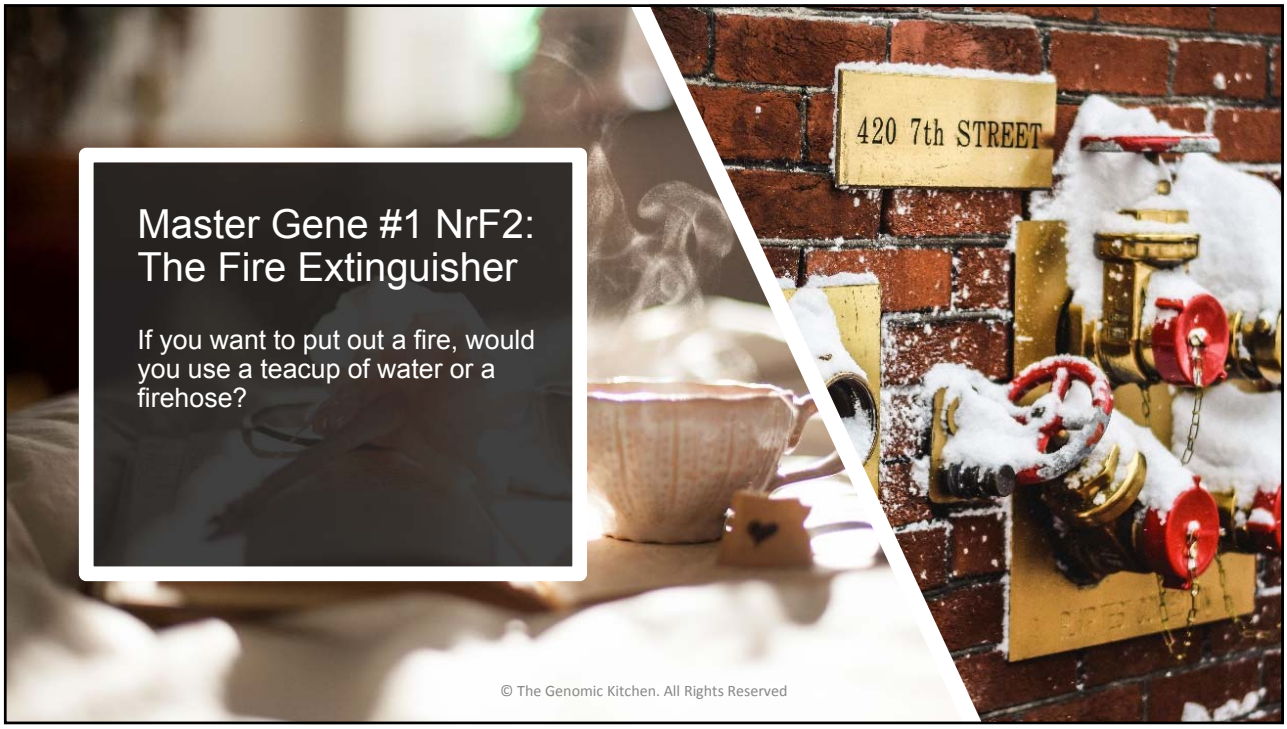
BIOACTIVES: "*Constituents* in foods other than those needed to meet basic human nutritional needs, which are responsible for changes in health status" - *The Office of Dietary Supplements at the NIH*

Bioactives are able to register a signal to the cell that sets in motion a series of biochemical events that influence gene behavior (expression)

Example: quercetin found in onions, garlic, leeks, shallots

How food works with genes

- Bioactives can set in motion the process by which genes make proteins
- Once proteins are formed, they needs vitamins and minerals (cofactors) to do their work
- Food provides bioactives and cofactors
- Food provides the ignition for genes and the nutrient support for the proteins they produce
- Which bioactives and which cofactors genes and their proteins need, depends on the health outcome we are targeting
- In the Genomic Kitchen we look at specifically at how genes help manage oxidative stress, inflammation and metabolism



Master Gene #1 NrF2: The Fire Extinguisher

If you want to put out a fire, would you use a teacup of water or a firehose?

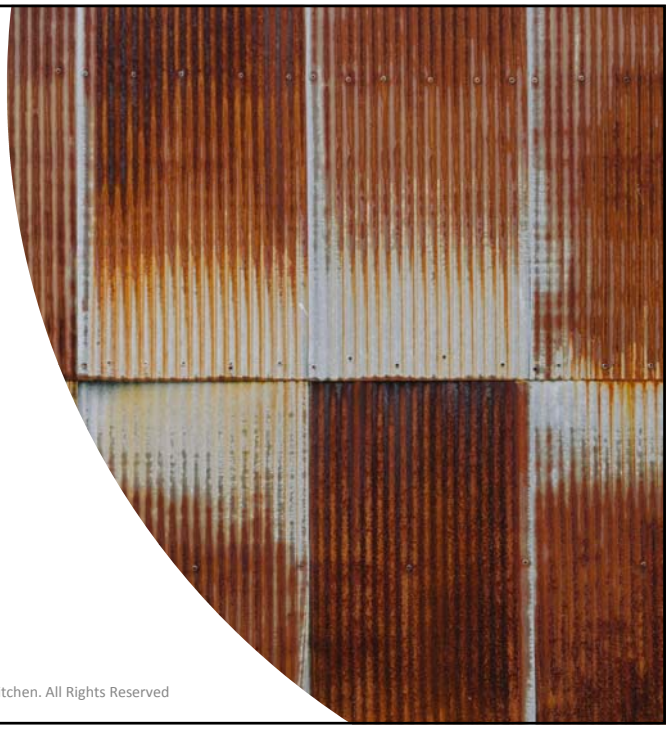
What's the difference?

- Antioxidants like Vitamin A, C and E which you get from your diet, put out the fire like a teacup of water
- They extinguish the fire on a 1:1 ratio

Master Influencer Ingredients

- Turn on the Nrf2 gene which signals the production of antioxidant enzymes (proteins) that act like a firehose in the cell
- They extinguish at a rate of millions per second
- The body works with both the teacup and the firehose to extinguish fires in our cells
- The Nrf2 "Firehose" system is the most effective
- Fires that rage out of control cause oxidative stress. Oxidative stress leads to inflammation
- Oxidative stress and inflammation are at the root of disease

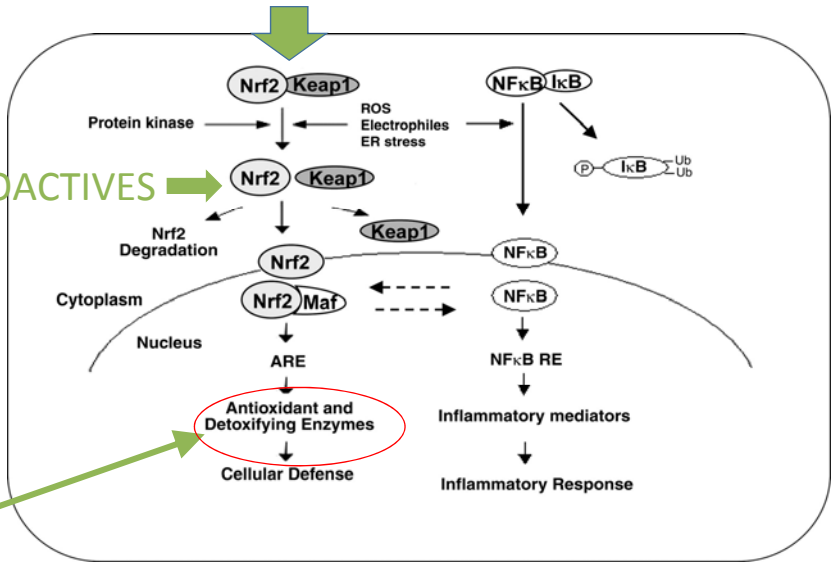
Oxidative stress is like rust in the body

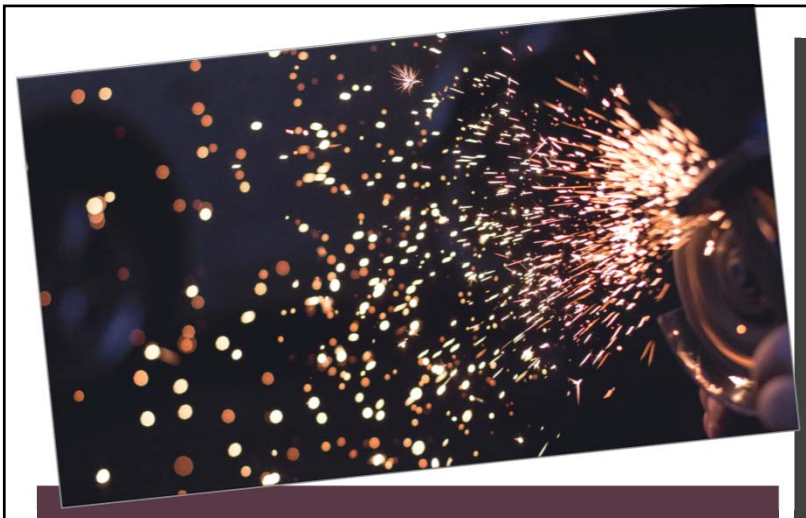


How do we turn Nrf2 on?

BIOACTIVES

MAKE THE FIREHOSE





Nrf2

Helps you put out a fire
when it gets started

And the science says….

If we upregulate or turn on Nrf2, we efficiently manage oxidative stress, or help the cell neutralize more free radicals.

Free radicals are unstable oxygen molecules, that left unattended, can cause a lot of damage to cells and tissues.

Nrf2 is important as one of our antioxidant mechanisms.

It also helps support detoxification, particularly in removing toxins from the body that result from environmental exposures. It does so by prompting the production of proteins that support this work.

Bioactives in certain foods, particularly the cruciferous family and the allium family, can initiate the process by which we set the Nrf2 gene in motion.

It turns out that some of the same foods that turn on the firehose, can also prevent fires from igniting

Fires are ignited when we turn on the TNF-Alpha & NfkB Genes.

Master Genes 2 &3

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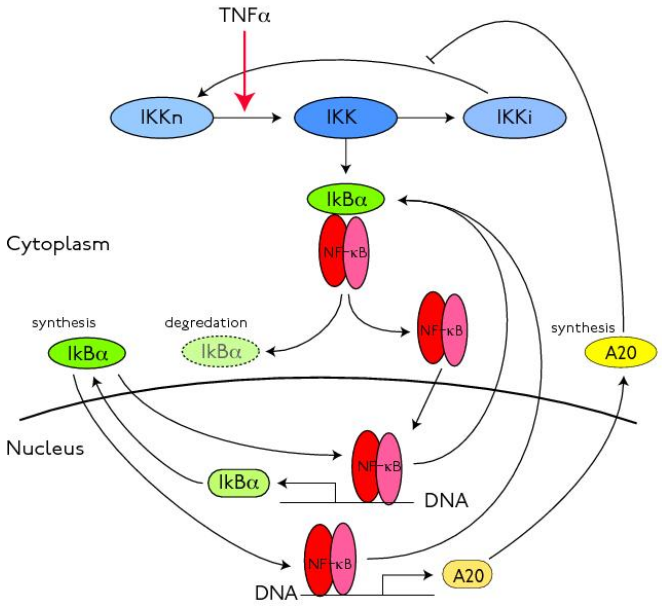
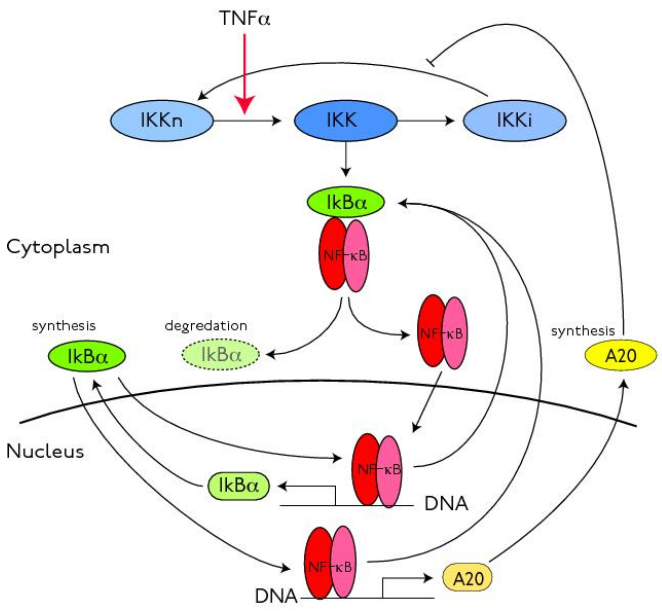
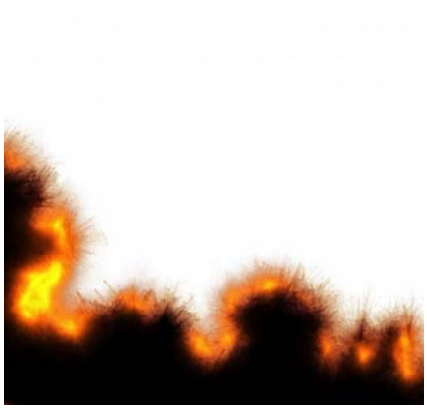
Master Genes 2 &3

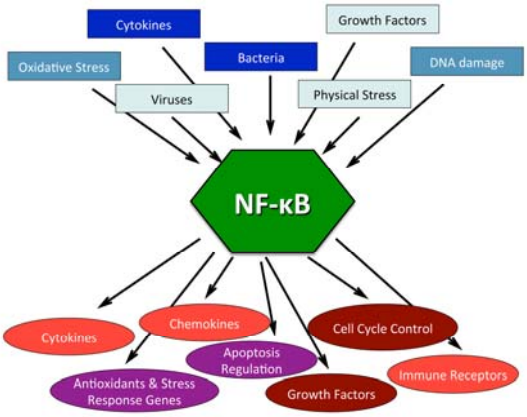


When the TNF-alpha gene is stimulated, it sets in motion a powerful sequence of signals that influences NfkB, another pro-inflammatory gene.

We want to use food to prevent this cascade of events.







A raging fire does much damage

The Science says..

- NfkB and TNF-alpha are different from Nrf2 because we want to turn down their volume, the opposite of Nrf2.
- If NfkB and TNF-alpha are turned on, one of the results is the inflammatory response.
- An inflammatory response is OK of it is in response to trauma, or perhaps a sudden exposure to a virus, for example. But for many, this inflammatory response is permanently switched on as a result of chronic stress.
- Inflammation is the root cause of many diseases like arthritis and so we want to dampen any process by which pro-inflammatory genes are constantly turned on.

Master Influencer foods can reduce the spark that ignites the fire.

At the same time, they can help extinguish fires if they get started.

Master ingredients will be revealed very soon!

Master Gene # 4 SIRT-1

- Like NrF2 and NfkB – SIRT-1 is a Master Gene.
- It influences many processes
- Think of it as sitting at the hub of many genes that influence metabolism

It helps to

- Manage inflammation
- Create smooth as smooth silk blood sugars. SIRT-1 helps improve the efficiency of the blood sugar master hormone: insulin
- Helps the body more effectively use and store fat
- Works closely with the CLOCK gene and your natural circadian rhythm

Effective management of inflammation, blood sugars and fats is consistent with longevity.

Resveratrol upregulates or "signals" to the SIRT-1 gene to get into action.

SIRT-1 does not work by itself. It works in tandem with other genes such as AMPK and PPAR-alpha and gamma

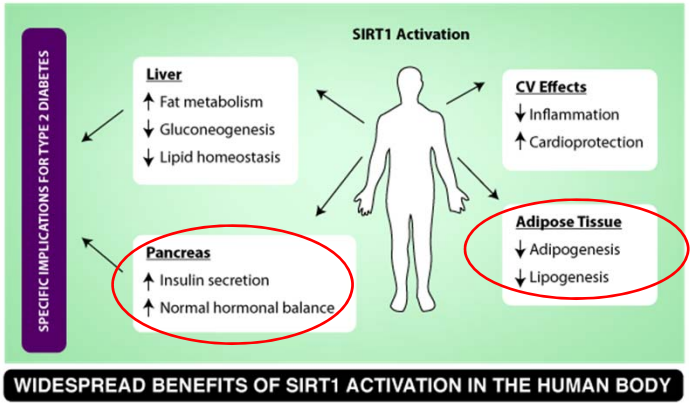


Image Source: Labgrab

Remember the Blue Zones?

- Red Wine is a consistent part of daily life in Ikaria and Sardinia (Blue Zones)
- Resveratrol is found in red wine/grapes, peanuts
- Both undernutrition and hypocaloric intake can activate SIRT-1 (and AMPK)
- The island of IKARIA suffered severe food shortages in World War I
- Hara Hachi Bu is a principle of Blue Zone: Okinawa and means eating until you're 80% full

Overnutrition, or too many calories, shuts down SIRT-1 (and AMPK)

Interesting fact

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MASTER INGREDIENTS

FRUIT
Apples
Blackberries
Bilberries
Elderberries
Grapes
Pink Grapefruit
Pomegranate
Raspberries
Strawberries
(Cooked) Tomatoes
Watermelon

VEGETABLES
CRUCIFERS
Arugula
Bok Choy
Broccoli
Brussel Sprouts
Cabbage
Cauliflower
Collard Greens
Dandelion Greens
Kale
Kohlrabi
Mizuna
Radishes
Radish leaves
Rutabaga
Tatsoi
Turnips
Turnip greens
Wasabi
Watercress

OTHER
Carrots
Fennel

ALLIUMS
Garlic
Leeks
Onions
Shallots

LEGUMES
Broad beans (fava/pigeon peas)
Peanuts

HERBS
Basil
Chives
Cilantro
Dill
Lavender
Lovage
Oregano
Parsley
Rosemary
Sage
Thyme

SPICES
Ginger
Hot chili peppers
Turmeric

OTHER
Capers
Green tea
Honey
Olive oil
Red wine

THE GENOMIC KITCHEN® INGREDIENT TOOLBOX

Next Session: Working with Master Ingredients