



Otago Spotlight Series
Cardiovascular Disease

Discovering new risk markers for heart disease in 'junk DNA'

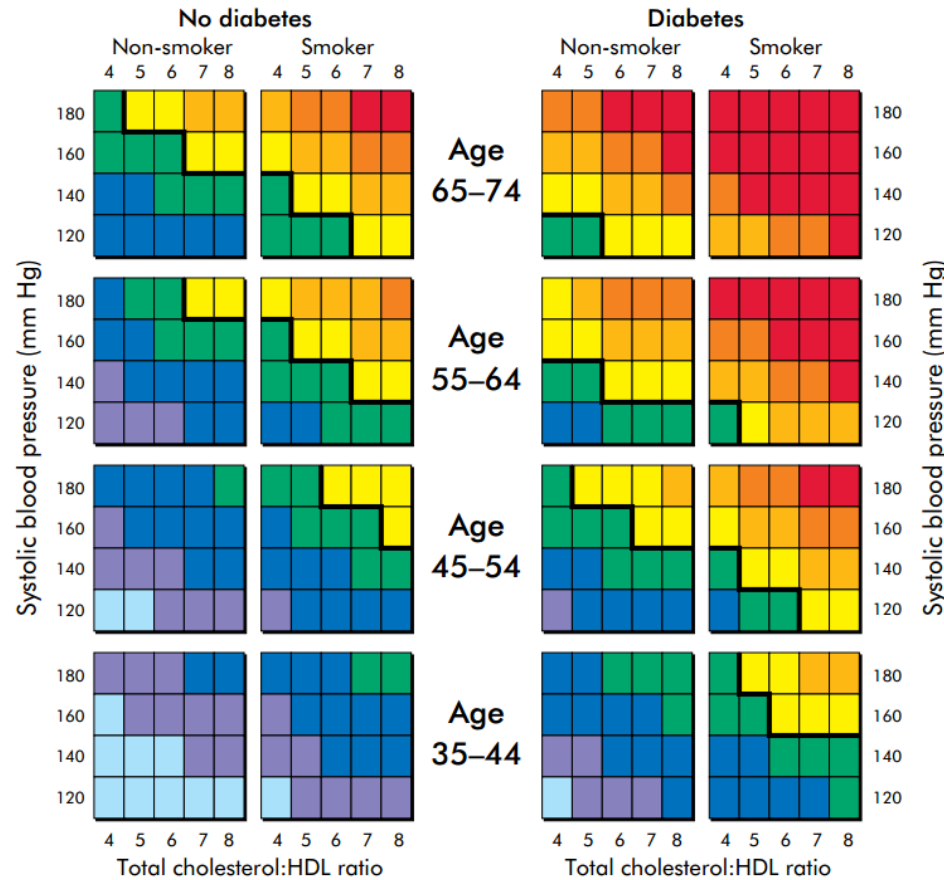
Dr Anna Pilbrow
Christchurch Heart Institute
University of Otago, Christchurch



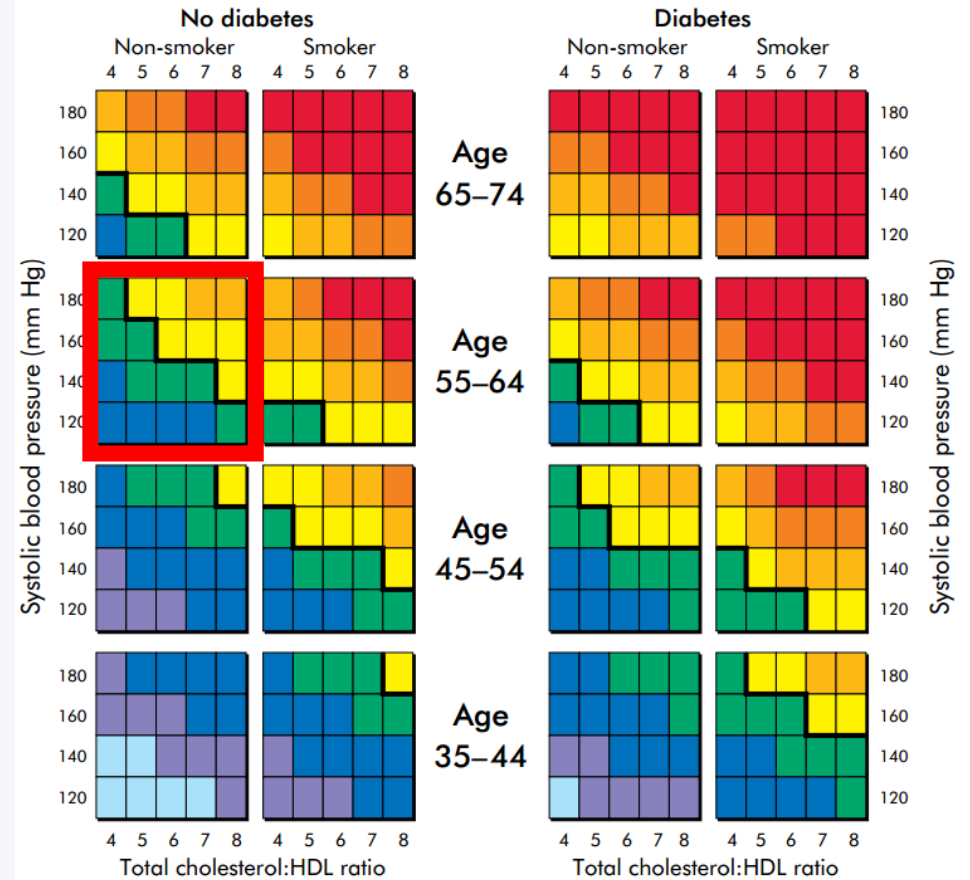
photo: Angie Forrest

New Zealand Cardiovascular Risk Charts

Risk level women



Risk level men

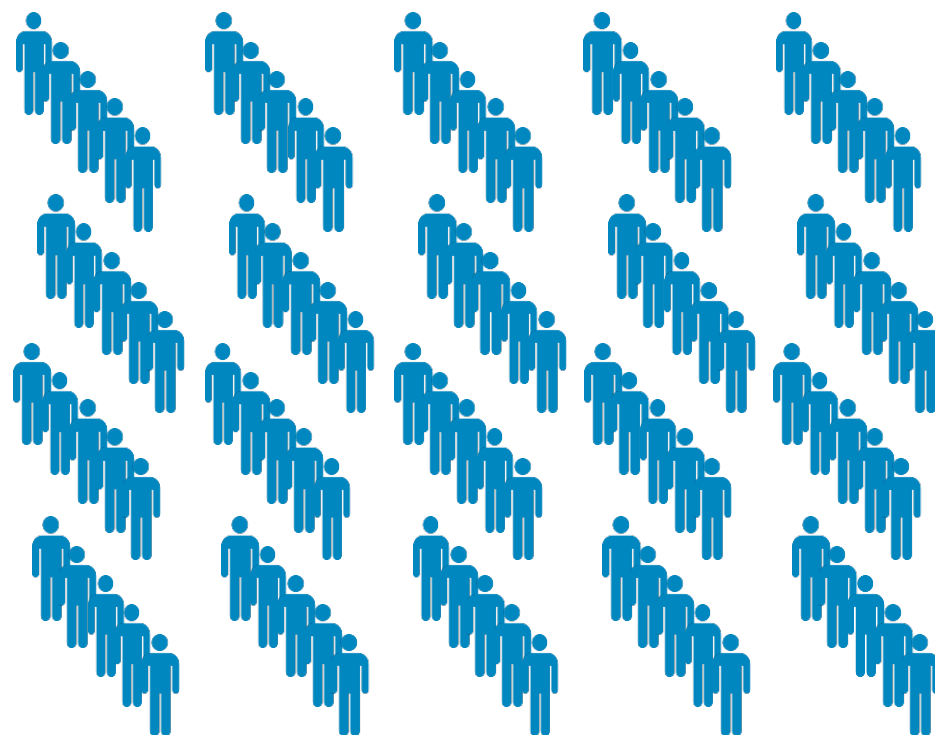
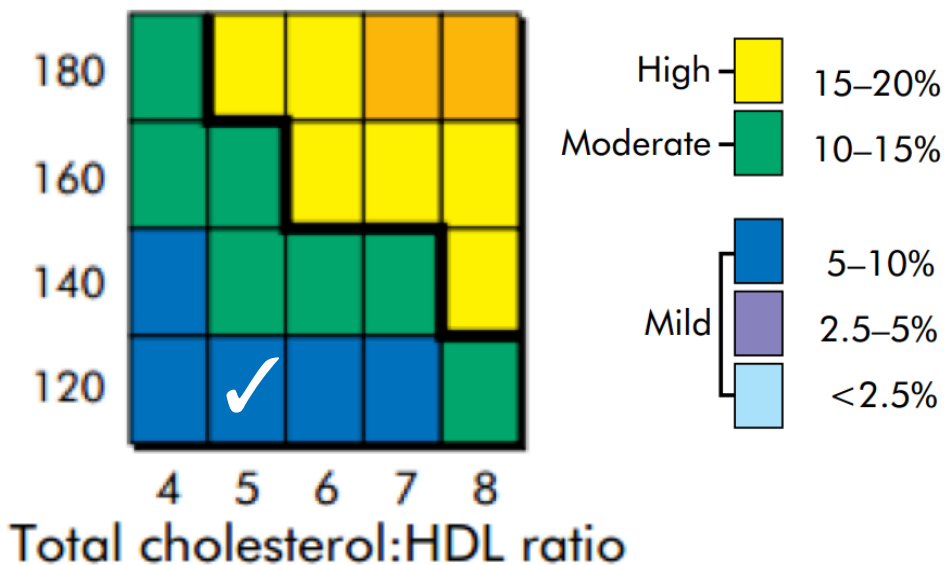


Risk level (for women and men)
5-year cardiovascular disease (CVD) risk (fatal and non-fatal)



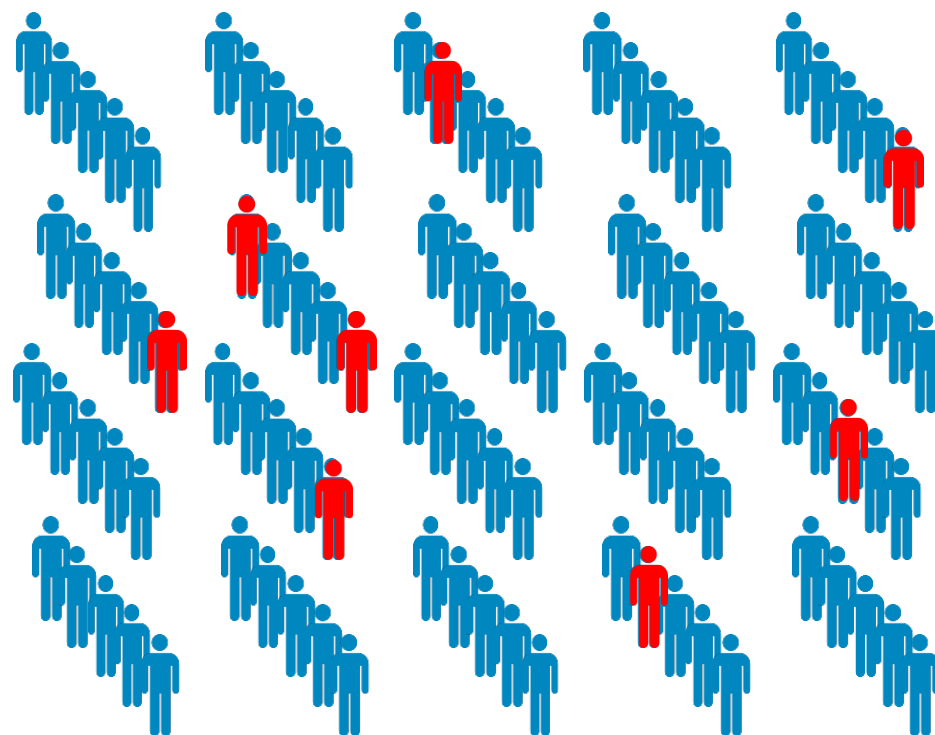
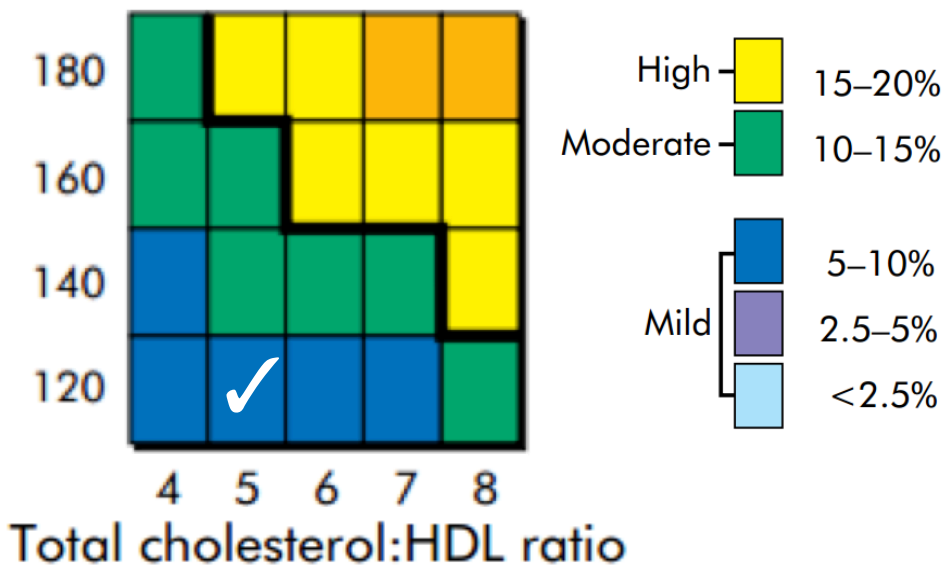
But, cardiovascular risk prediction isn't perfect

Risk level men
(55-64 years old)



But, cardiovascular risk prediction isn't perfect

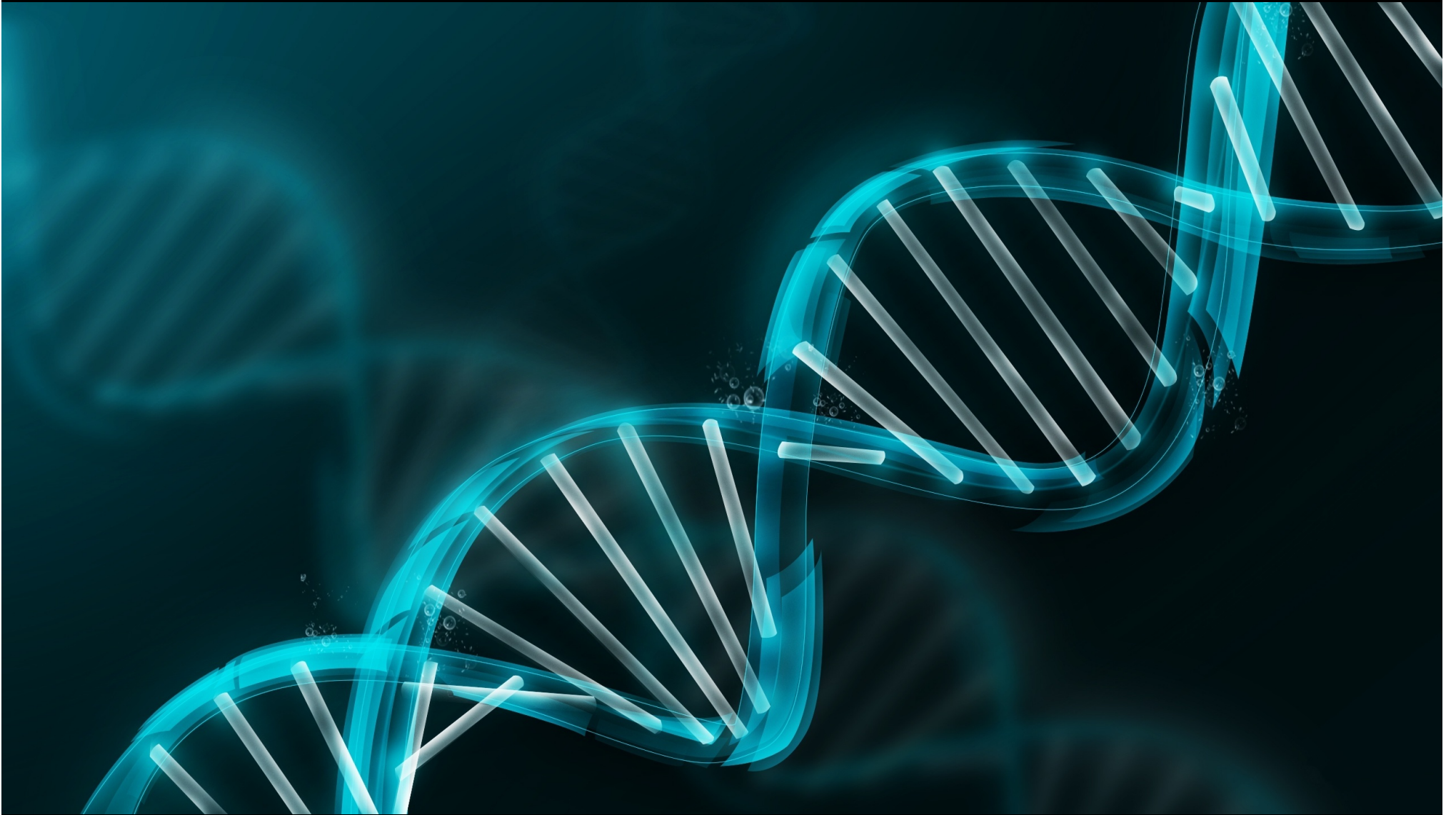
Risk level men
(55-64 years old)

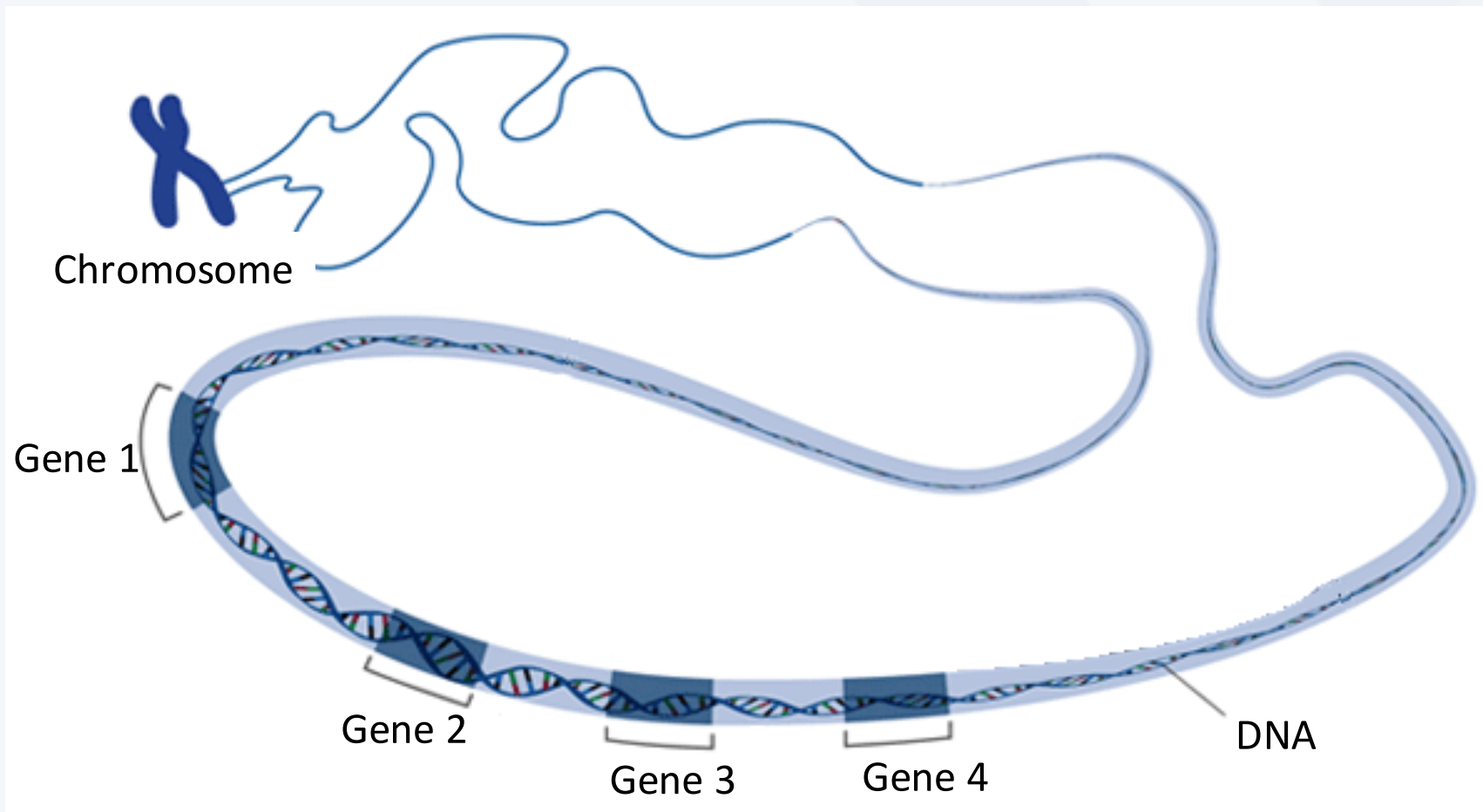


What if we could predict who will have a heart attack in the next year?

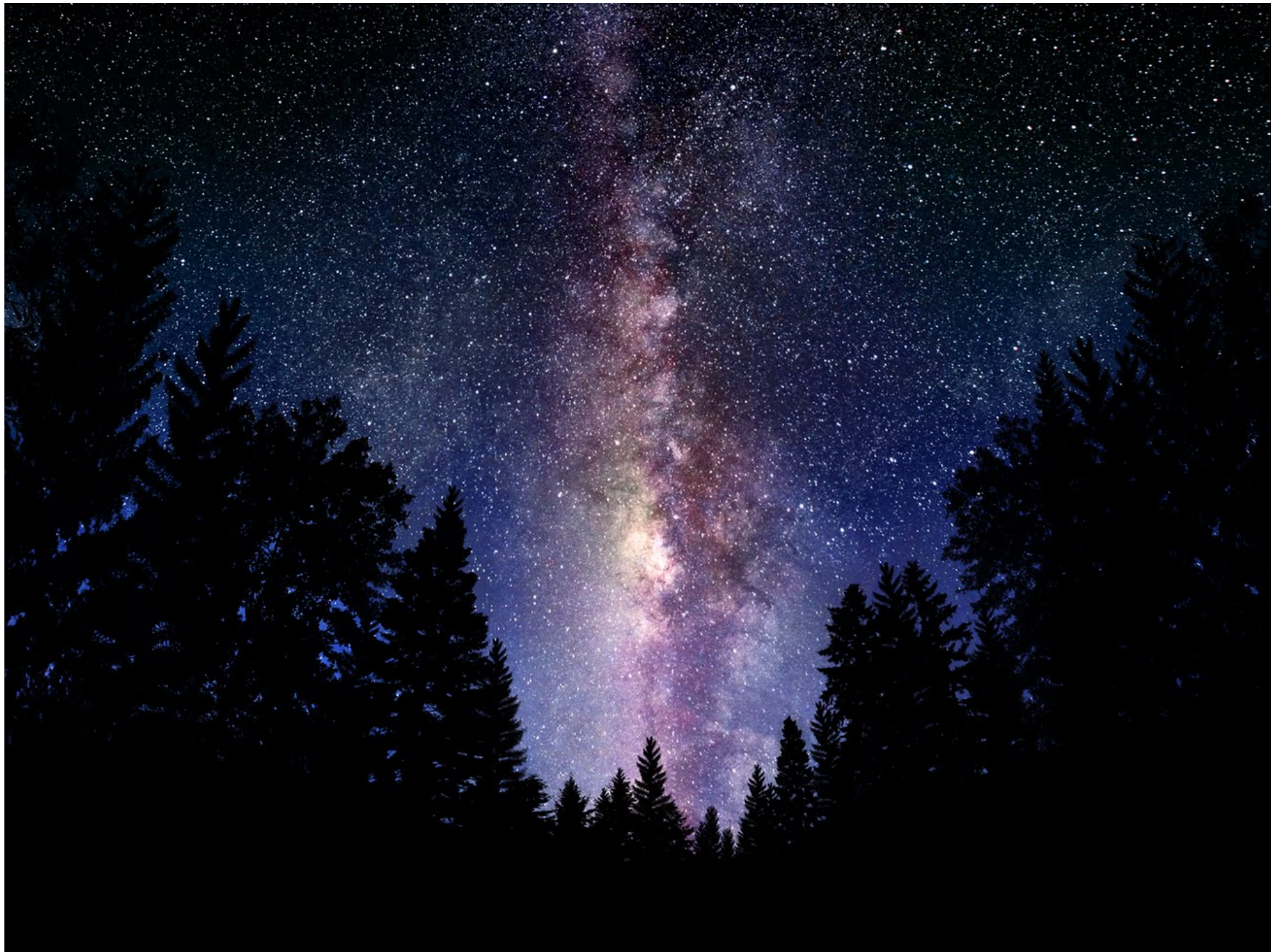


image source: WebMD

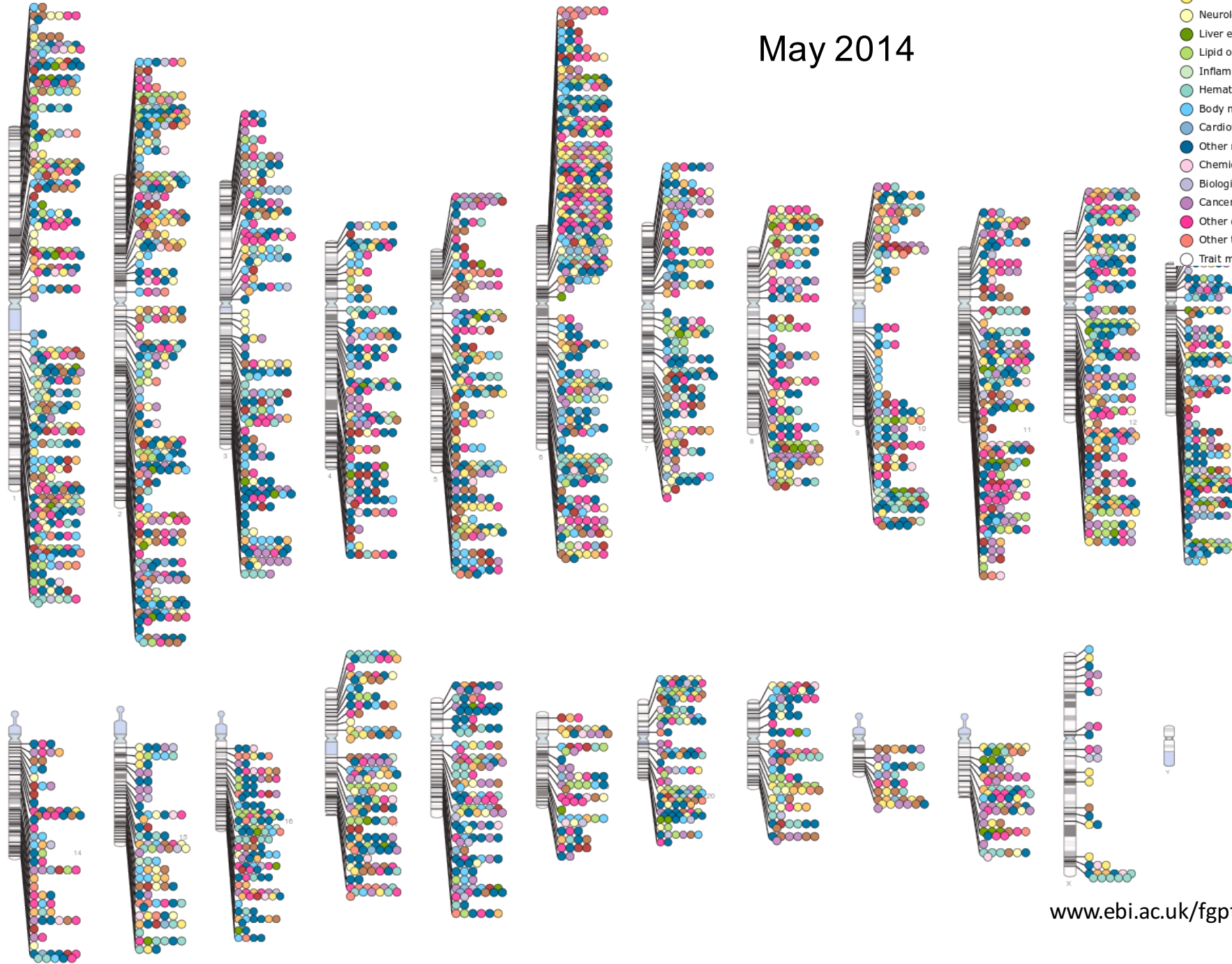




But genes only make up ~3% of our DNA

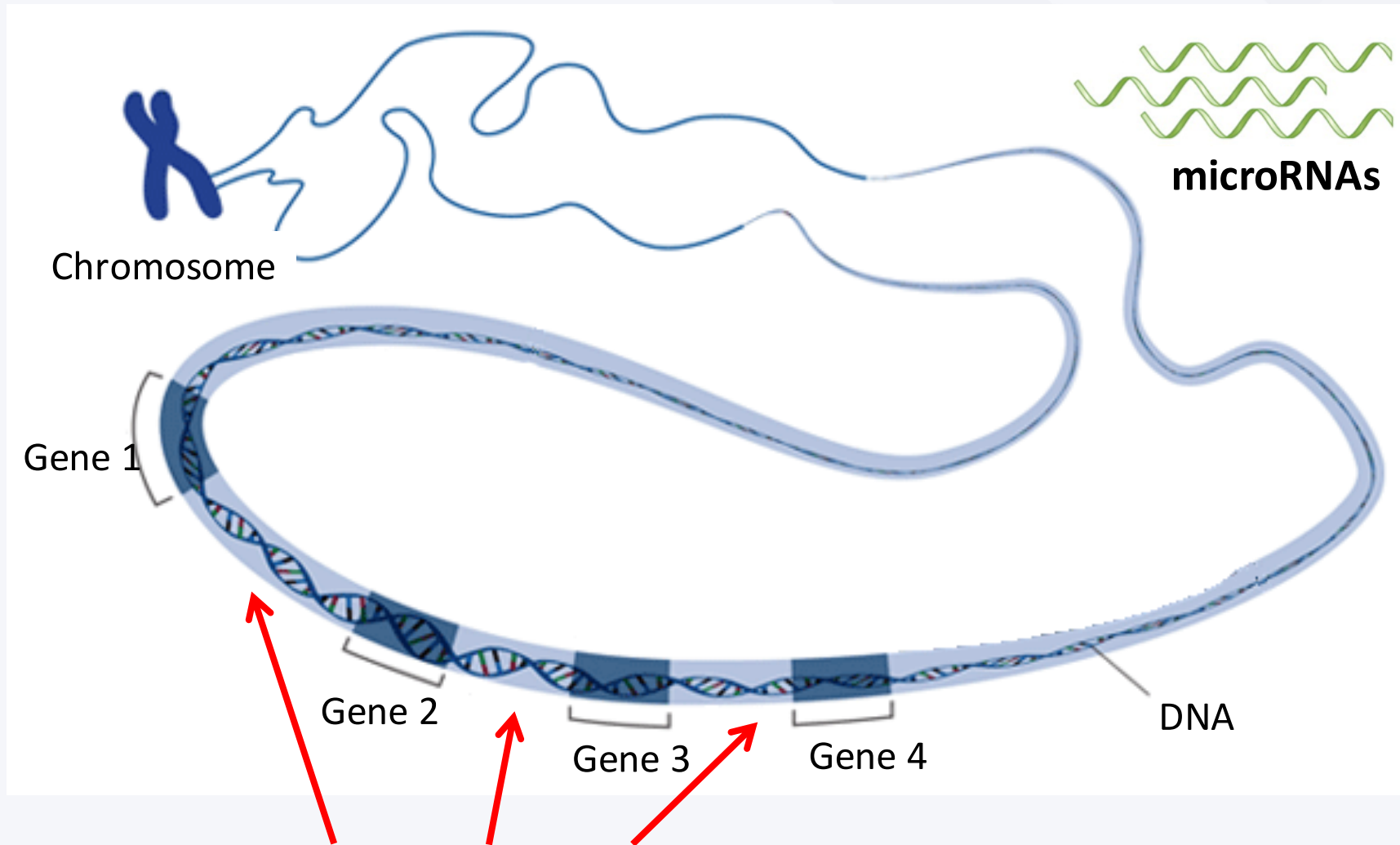


May 2014



- Digestive system disorder
- Cardiovascular disorder
- Metabolic disorder
- Immune system disorder
- Neurological disorder
- Liver enzyme measurement
- Lipid or lipoprotein measurement
- Inflammatory marker measurement
- Hematological measurement
- Body measurement
- Cardiovascular measurement
- Other measurement
- Chemical compound
- Biological process
- Cancer
- Other disease
- Other trait
- Trait mapping in progress

Genes and 'dark matter DNA'



Non-coding DNA ('dark matter')



Canterbury Healthy Volunteers (n=3,500)



Age:	65 years
Gender:	66% male
Ethnicity:	96% European
BMI:	26 kg/m ²
Current smokers:	7%
Heart healthy:	100%
Heart disease < 5 years:	15%



Using microRNAs to predict a future heart attack



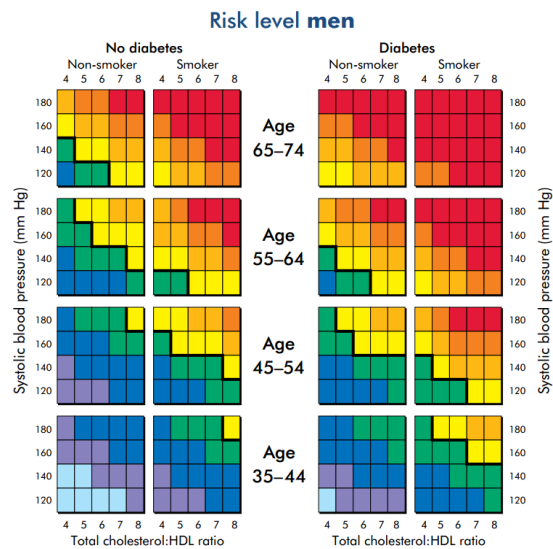
volunteers who subsequently
had a heart disease event

VS

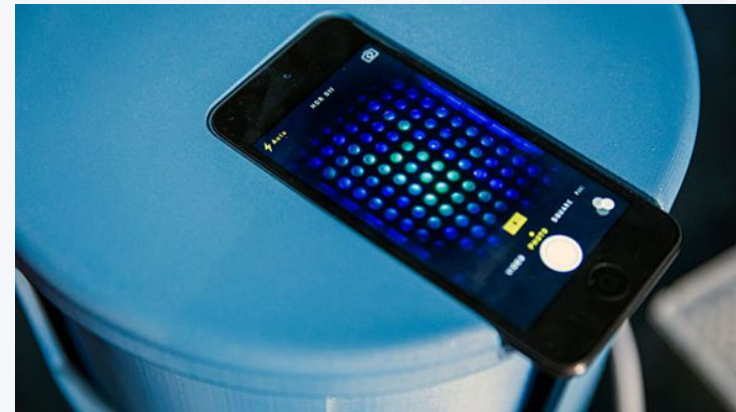


volunteers who remained
heart healthy

MicroRNAs add value to traditional risk factor profiling

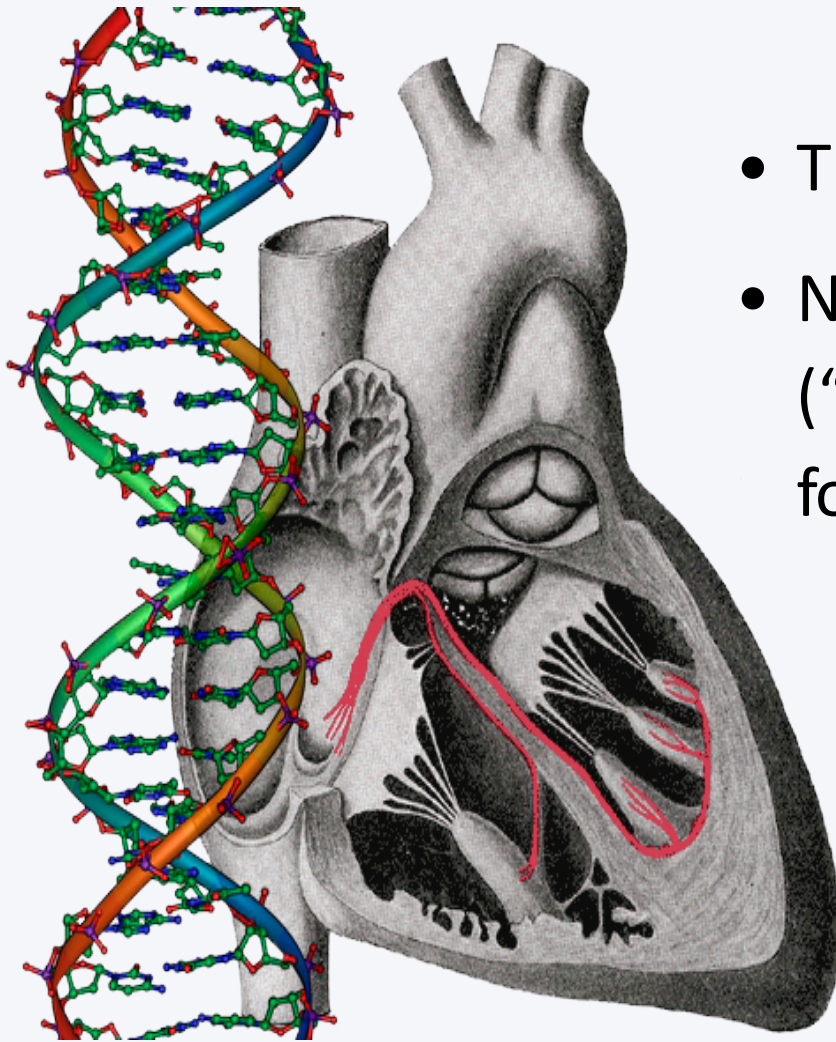


microRNA detector from Miroculus



Measures microRNA
levels in blood for early
detection of **cancer**

Summary



- There's no such thing as 'junk DNA'
- Non-coding regions of our DNA ("dark matter") are a treasure trove for new biomarkers.



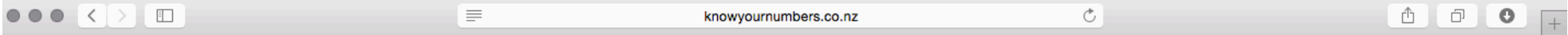
Acknowledgements

Canterbury Healthy Volunteers

Colleagues at the University of Otago, Christchurch

Vicky Cameron, Judith Thomson, Lorraine Skelton, Barbara Neame,
Chris Fampton, Richard Troughton, Mark Richards





WHAT ARE THEY?

Your heart numbers, blood pressure (BP) and your cholesterol ratio (TC/HDL), are two of the most important numbers you need to know because they give an insight into how healthy your heart is and also reflect the effect that your lifestyle is having on your body. >> [More](#)

WHEN SHOULD I VISIT A DOCTOR?

If you have used Your Heart Age Forecast and your risk of heart attack and stroke is 15% or over we recommend that you visit your doctor or nurse for a full heart health check. >> [More](#)

YOUR HEART AGE FORECAST

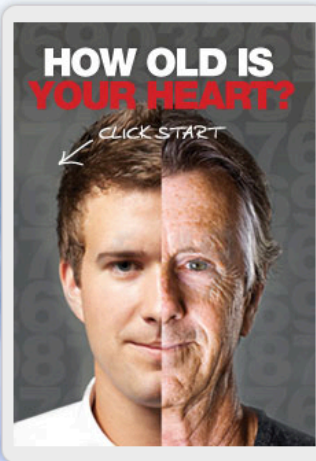
Your heart age measures how great your risk of a heart attack or stroke is. Find out with this easy to use tool. [START](#)

>> [More](#)

YOUR HEART HEALTH PLAN

It's never too late to take active steps to look after your heart. [LOGIN](#)

Already created a Heart Health Plan? [LOGIN](#)



HEART HEROES

Watch their story

Jenny Shipley
[See the video](#)

Len Brown
[See the video](#)

