Otago Spotlight Series

Cardiovascular Disease

Discovering new risk markers for heart disease in ‘junk DNA’

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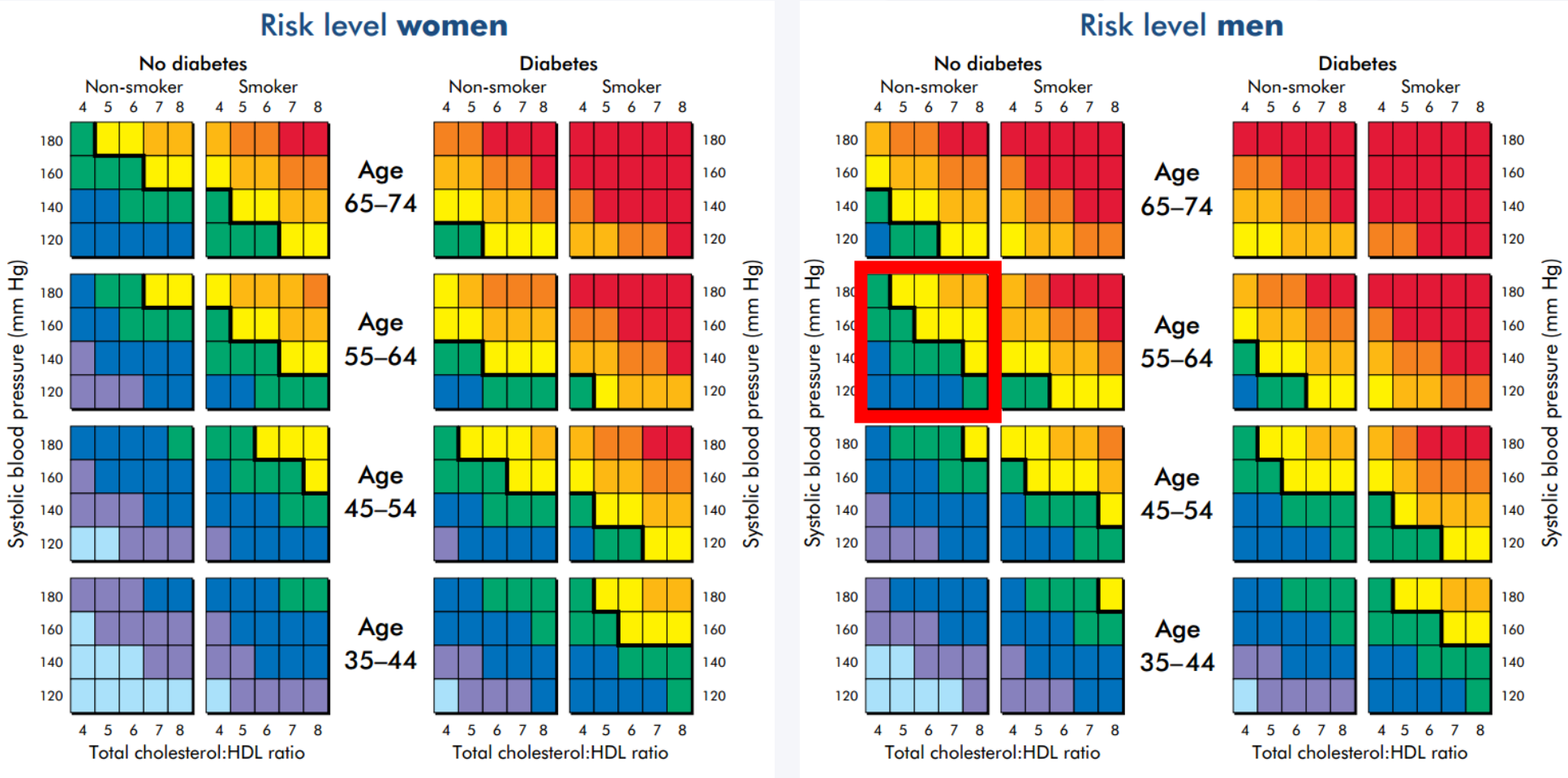
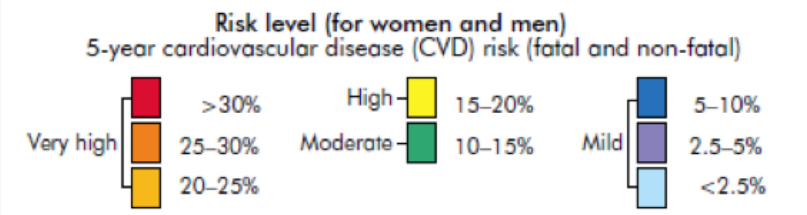
photo: Angie Forrest

New Zealand Cardiovascular Risk Charts





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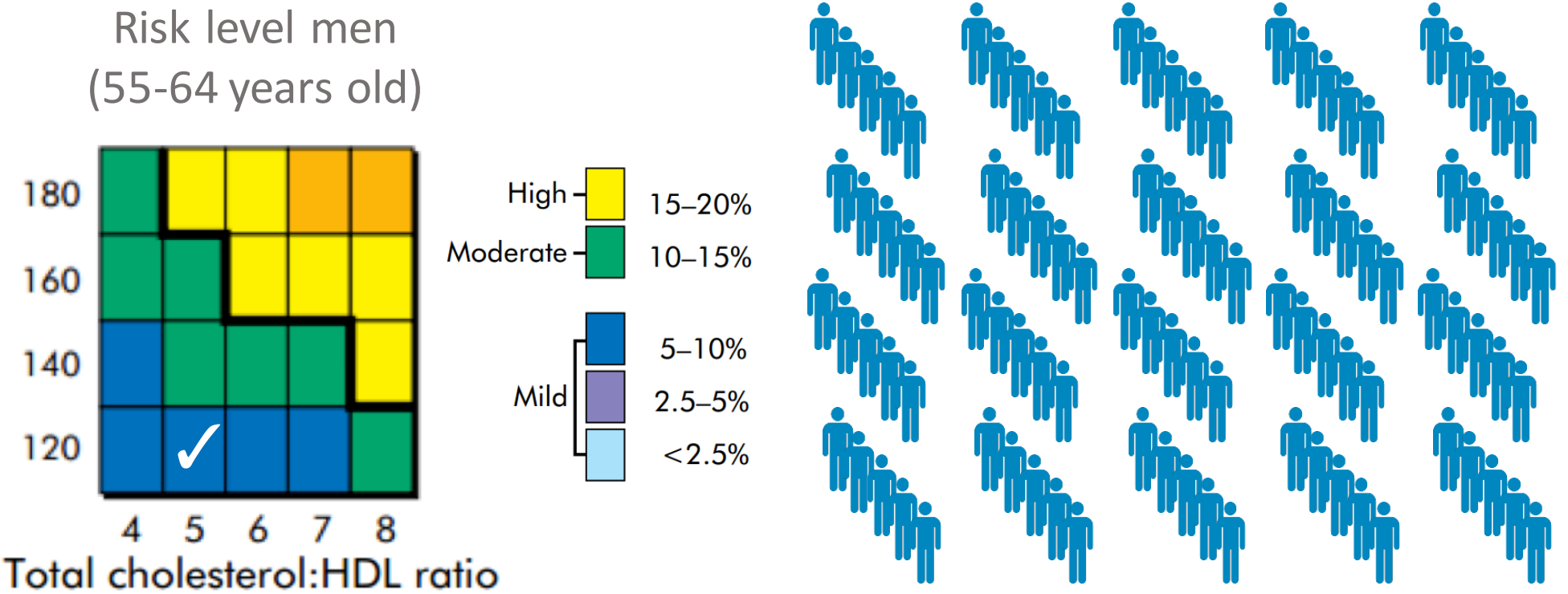
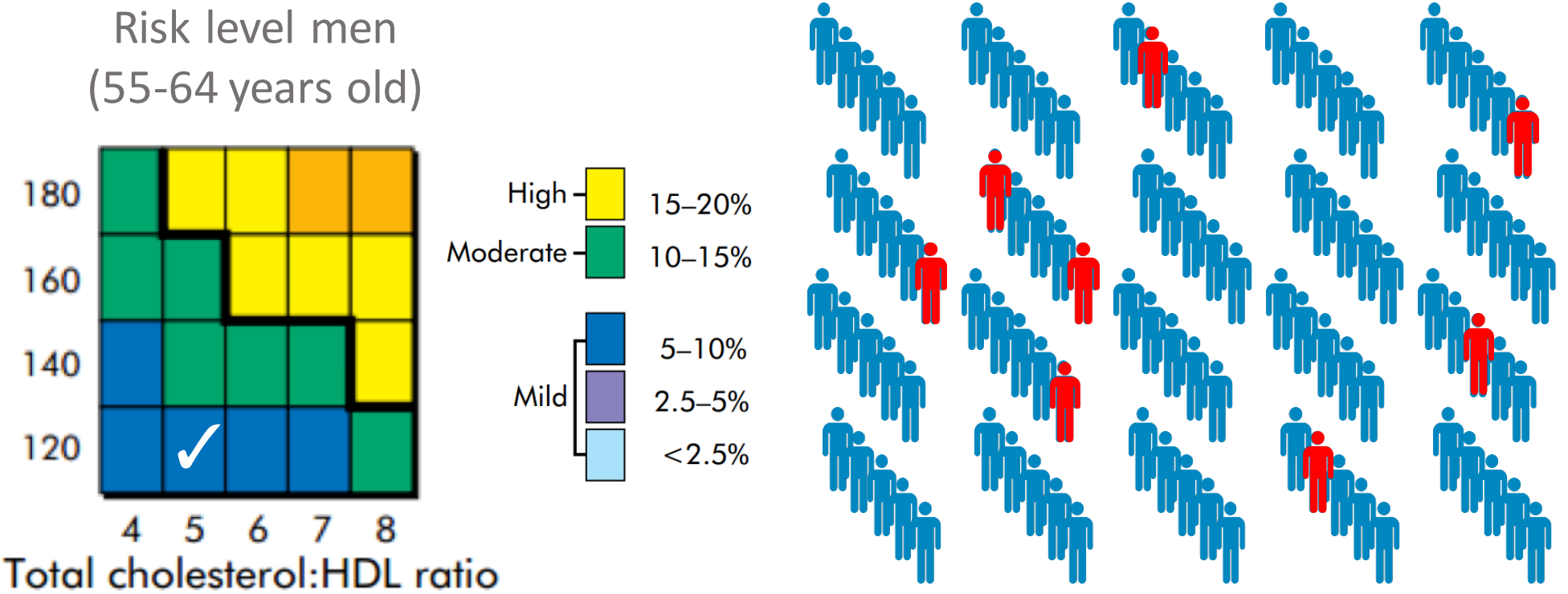
But, cardiovascular risk prediction isn't perfect



But, cardiovascular risk prediction isn't perfect



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

image source: WebMD

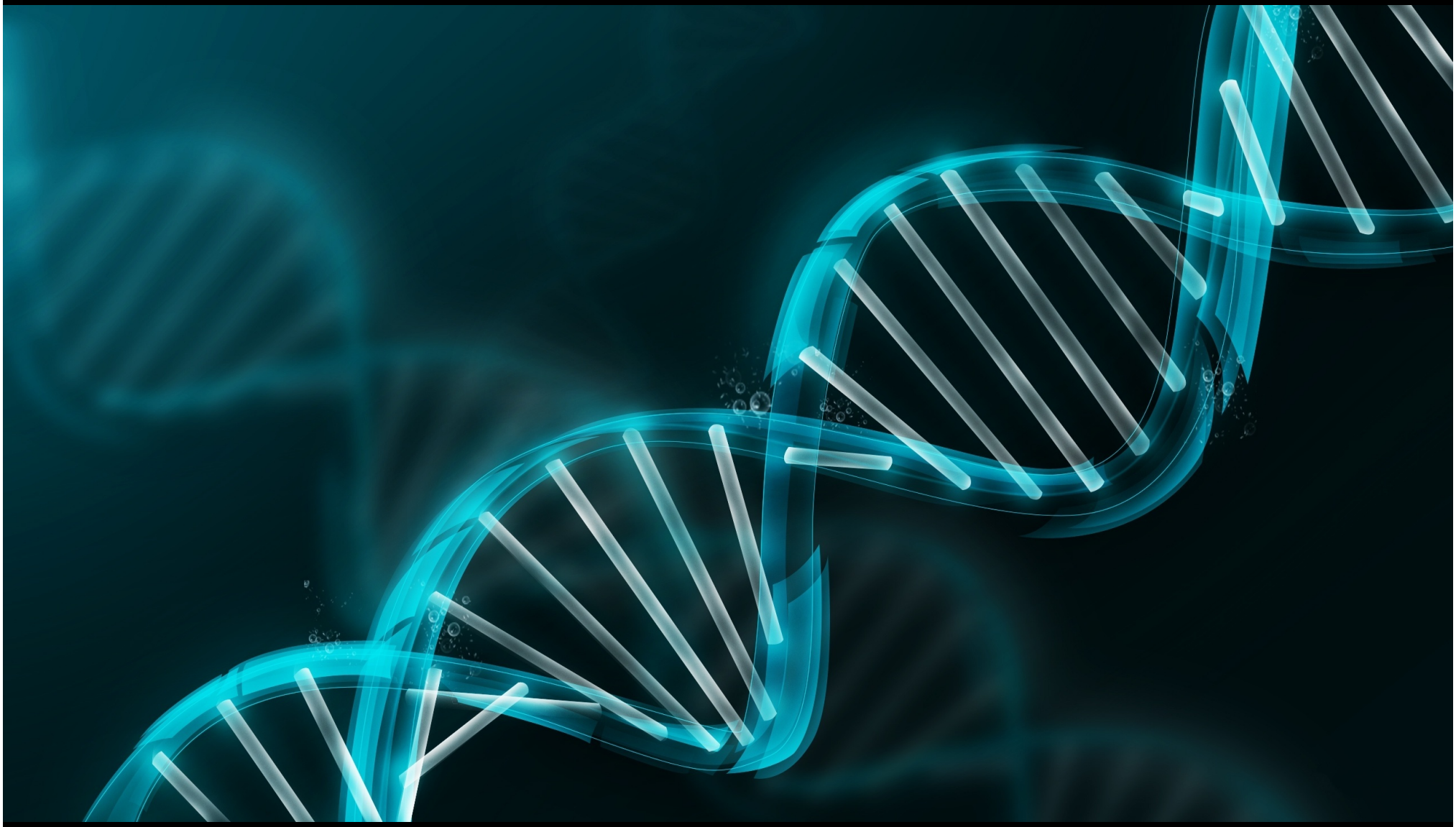
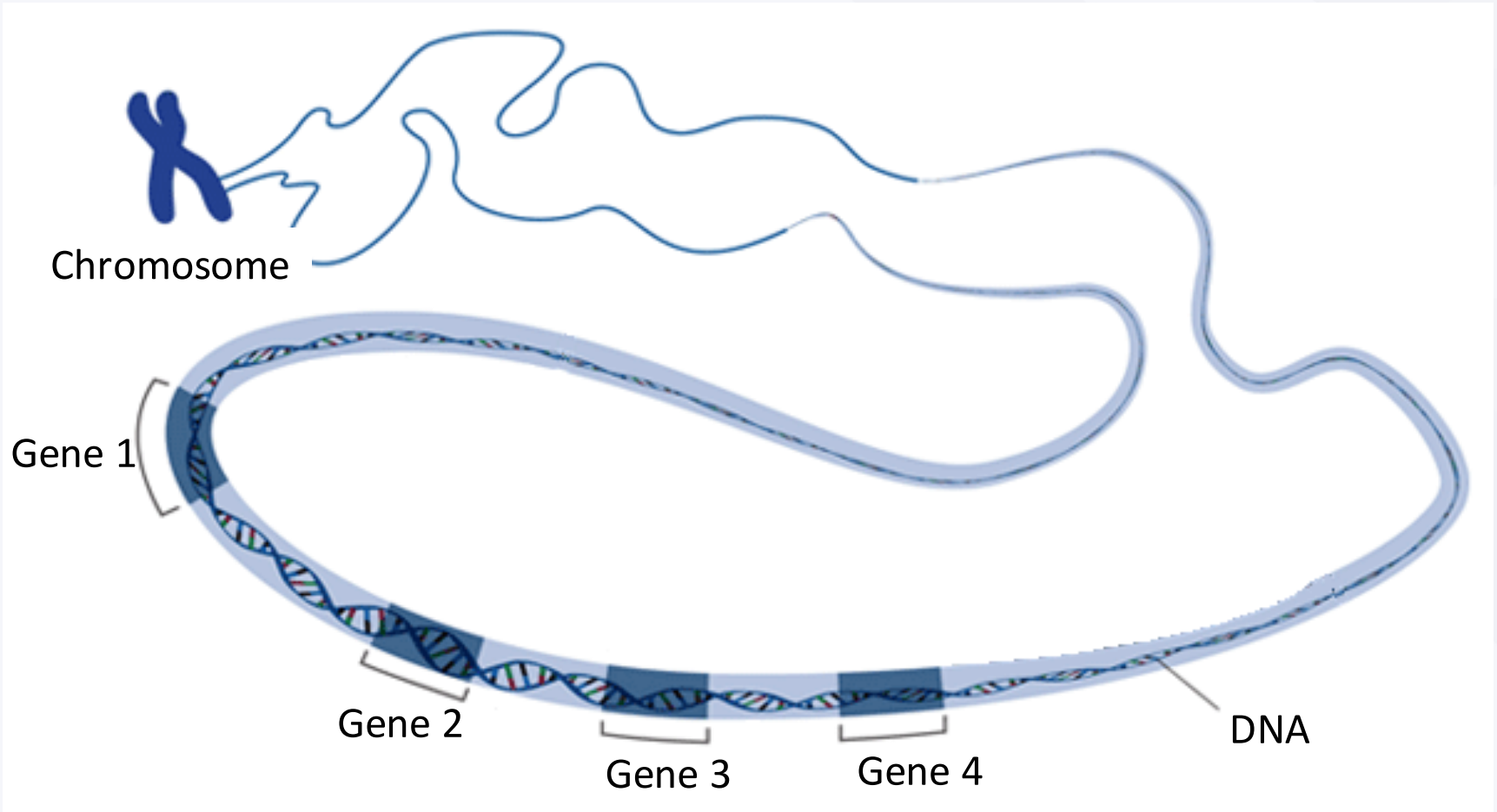
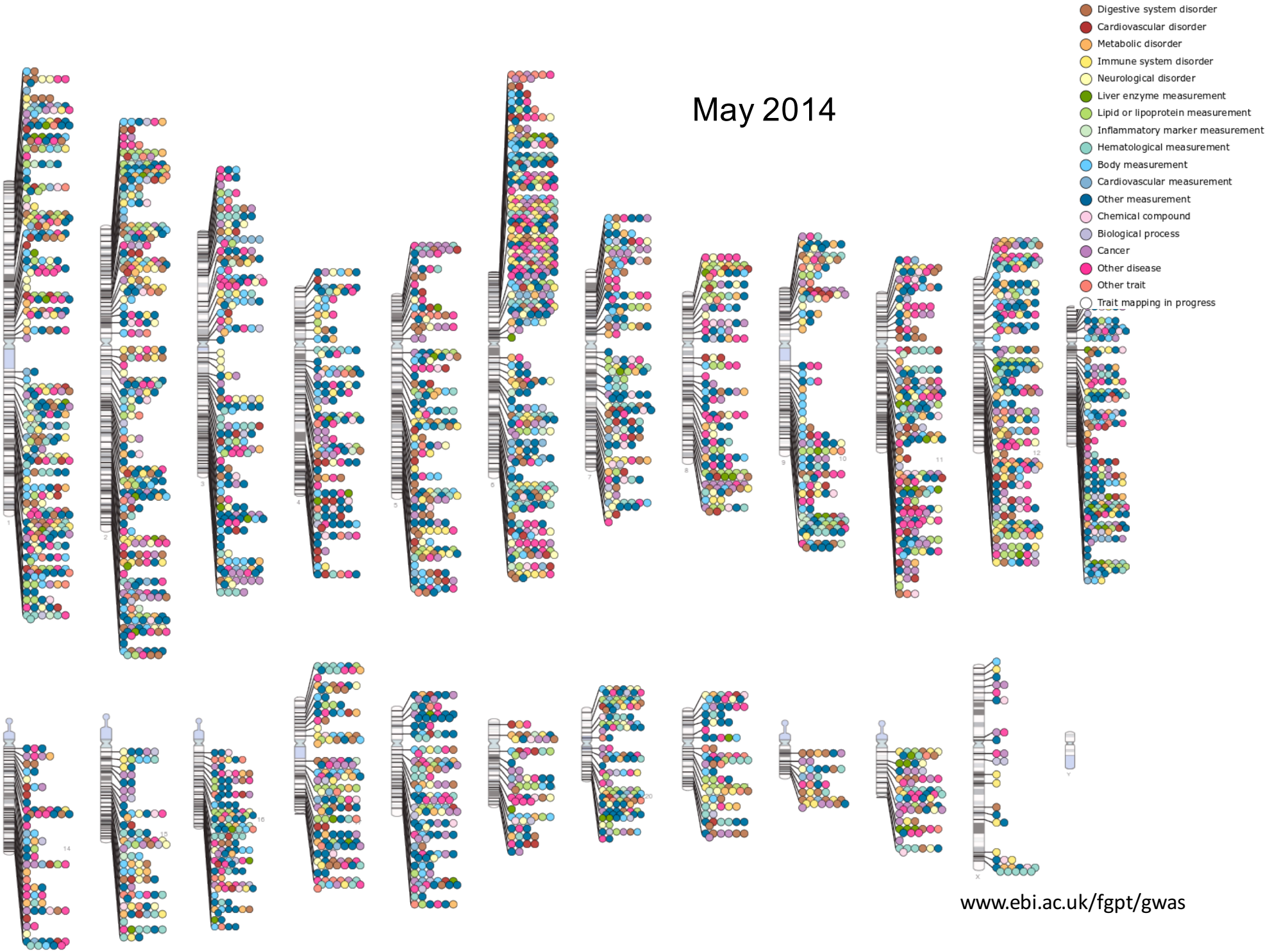


image source: www.wallpapers111.com/science-dna-wallpapers/

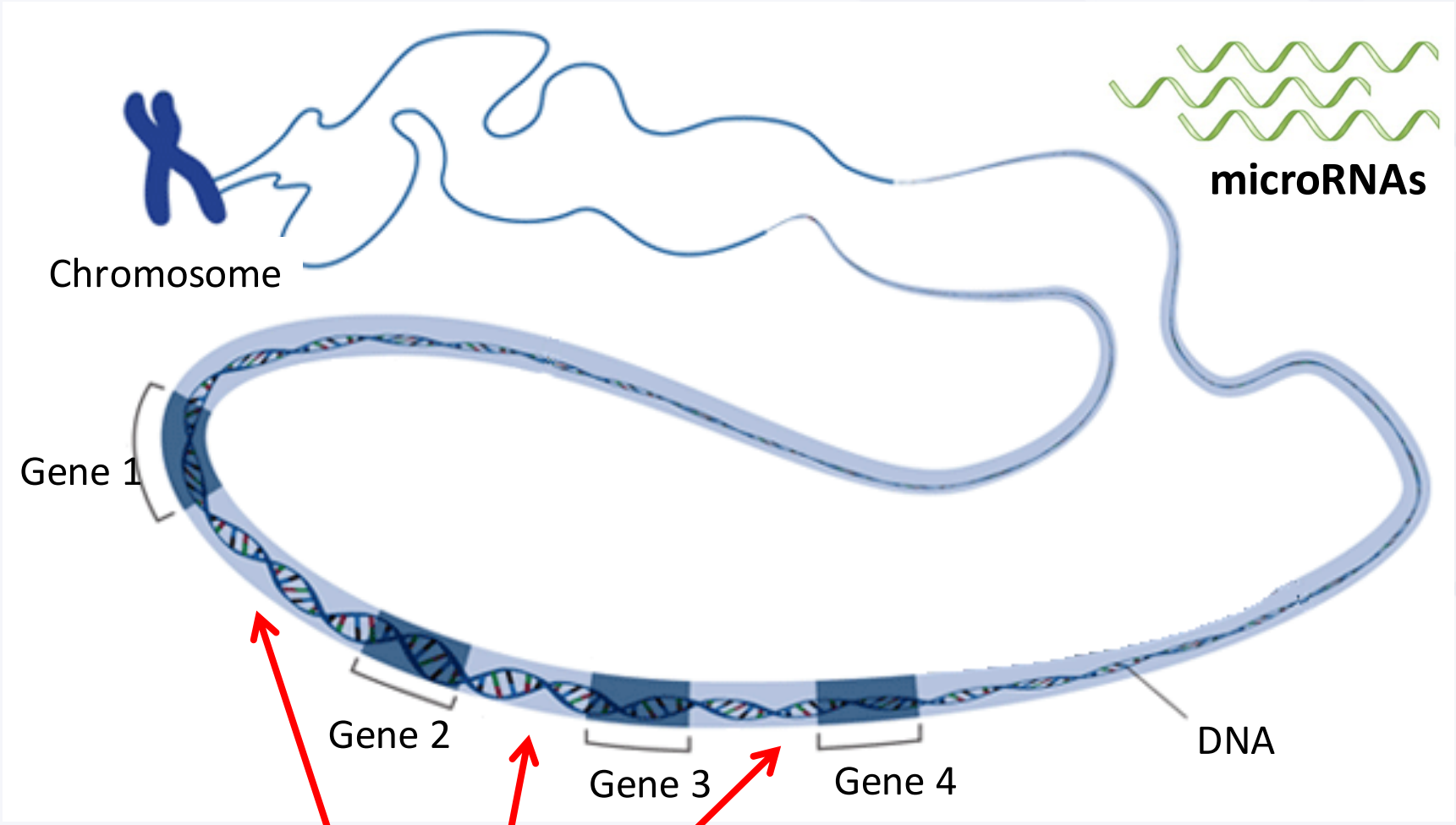


But genes only make up ~3% of our DNA

image modified from www.sciencewatch.com/articles/junk-dna-debate-aside-encode-papers-ride-high-citations


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
www.ebi.ac.uk/fgpt/gwas

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%

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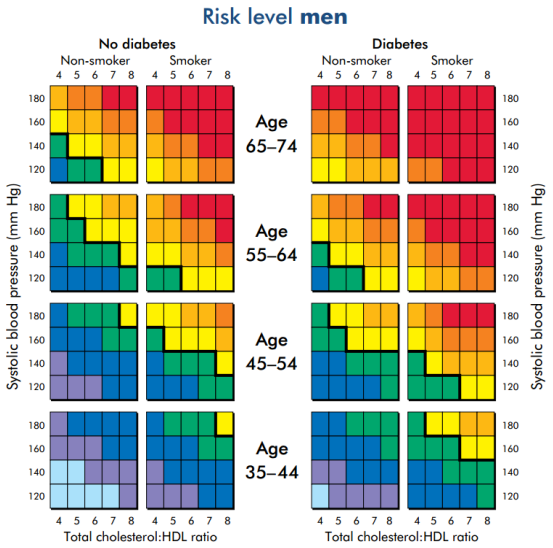
Using microRNAs to predict a future heart attack

volunteers who subsequently had a heart disease event

VS

volunteers who remained heart healthy

MicroRNAs add value to traditional risk factor profiling



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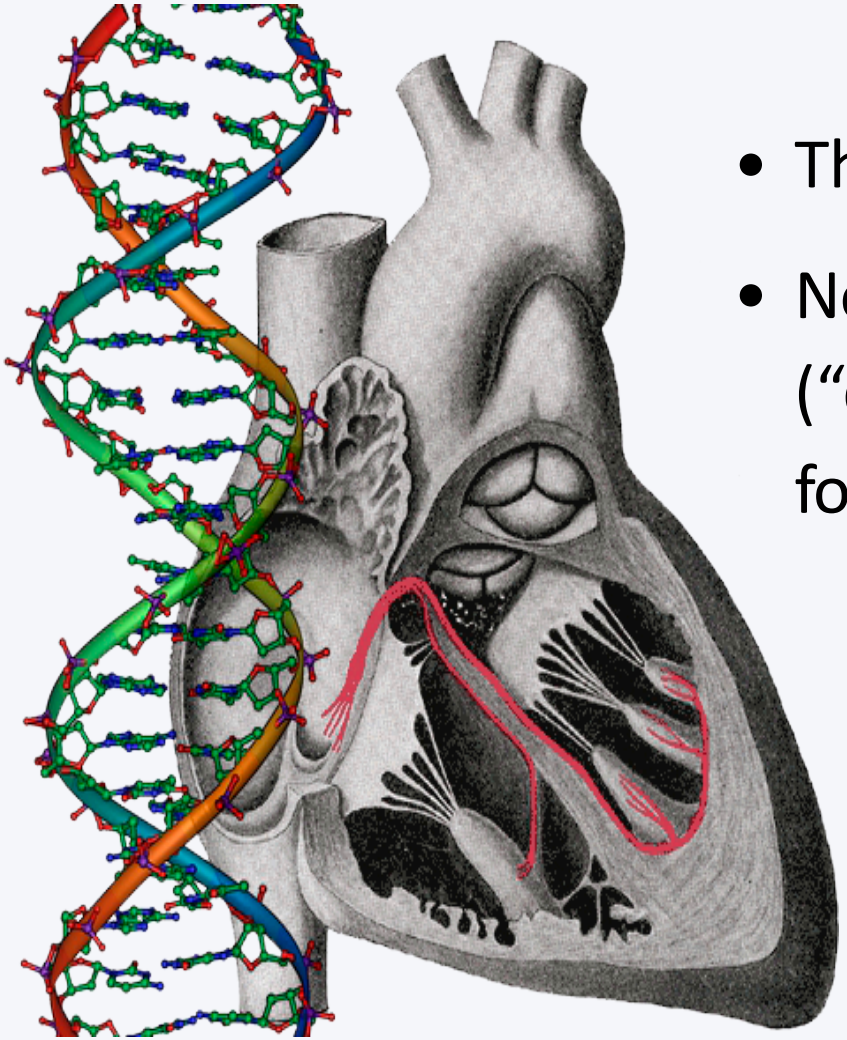
microRNA detector from Miroculus

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

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www.knowyournumbers.co.nz