

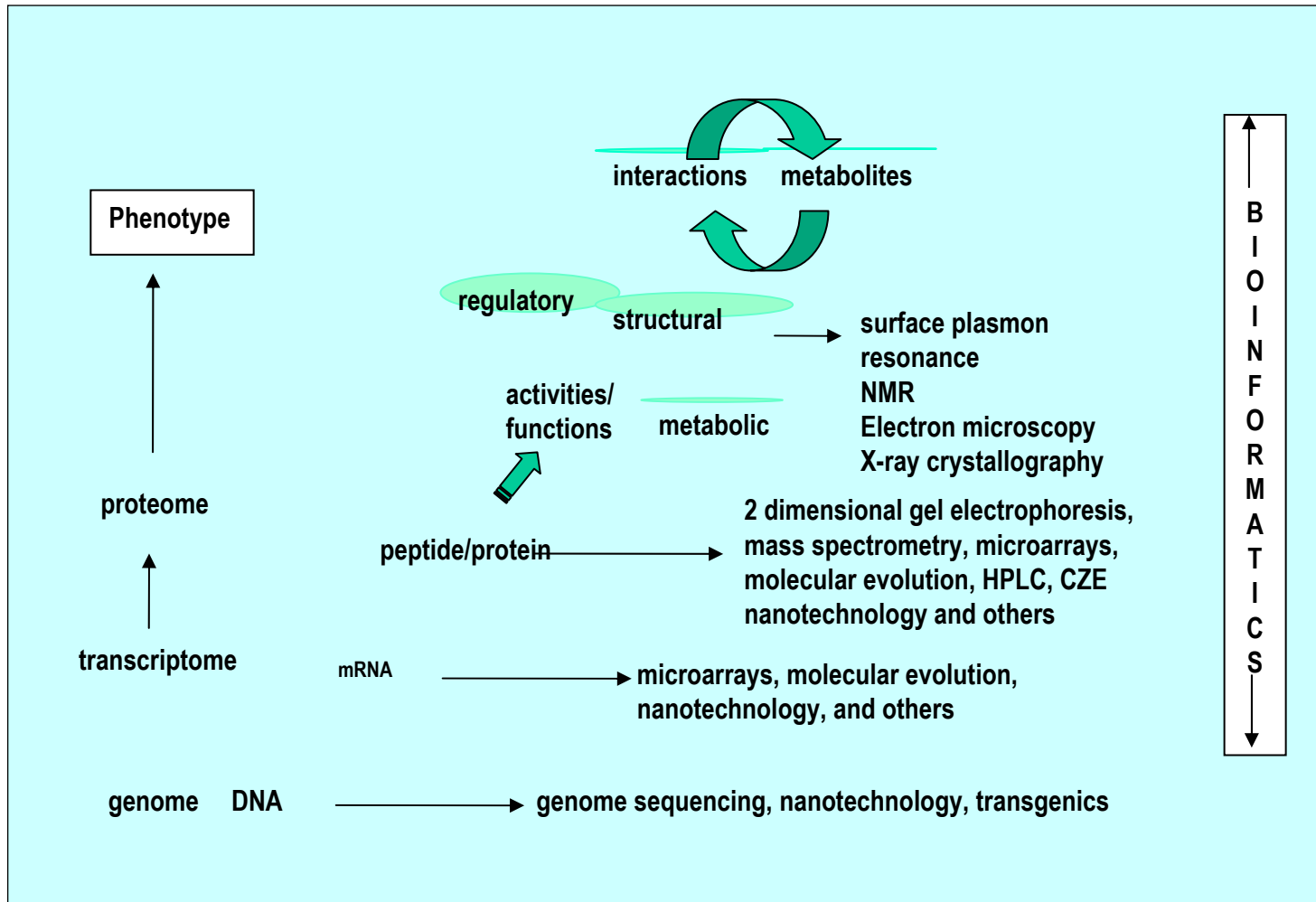


Biomarkers and Strategies in the area of Prevention in Human Health

Mapping the drivers

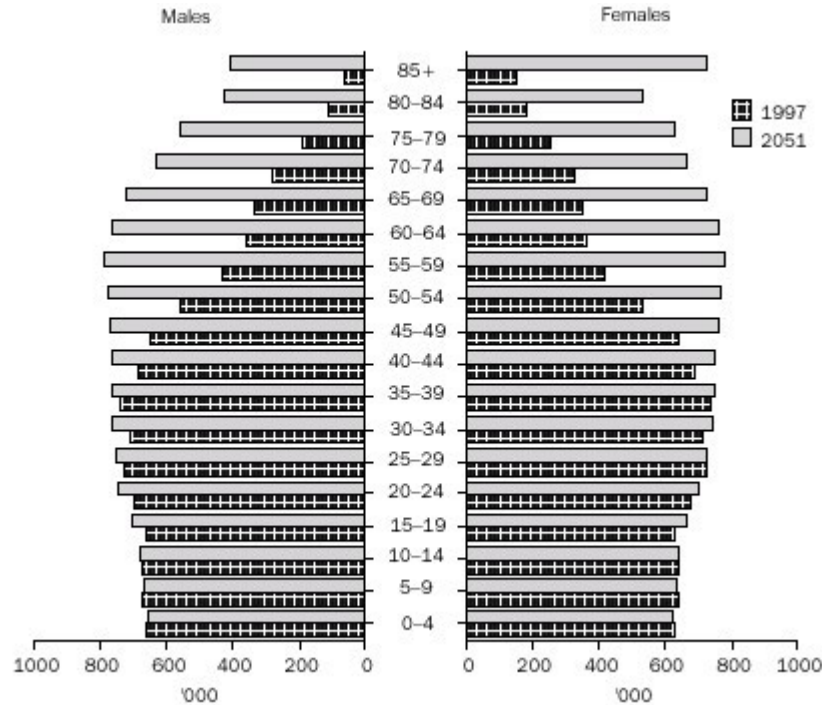


Example: Technologies – links between genotype and phenotype



Example:

Comparison of Australia's Population Pyramid, 1997 and 2051



Source: ABS Population Projections 1999-2101
Catalogue 3222.0

How - Mapping the Drivers

Areas of significance identified by external panel

- ✓ **Colorectal health and Cancer**
- ✓ **Mental Health**
- ✓ **Cardiovascular health**
- ✓ **Inflammation**
- ✓ **Environmental input/well-being**
- ✓ **Health Data Network**

Helping Australians live longer, healthier lives through early diagnosis and prevention

By Diagnosis and Prevention of Key Diseases

By Identifying Environmental Risk Factors

Colorectal Cancer

Cardiovascular Disease

Inflammatory Disease

Neurodegenerative Disease

TBD

Protective Foods
Diagnostics
Policy/
Guidelines

Protective Foods
Novel preventative approaches
Policy/
Guidelines

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Partnerships – an example



Neurodegenerative Disease

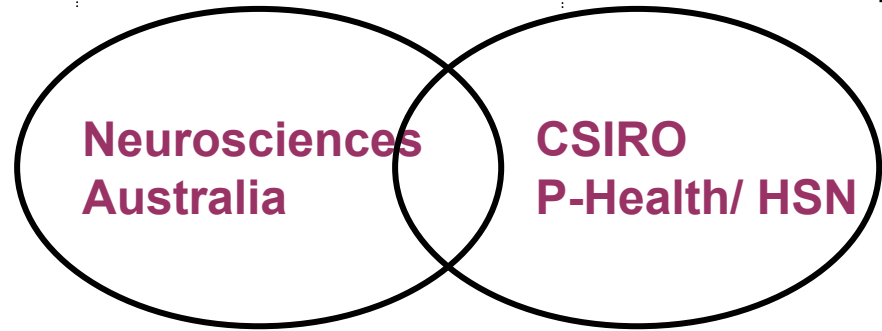
TBD

Policy/ Guidelines

Protective Foods

Novel preventative approaches

Policy/ Guidelines

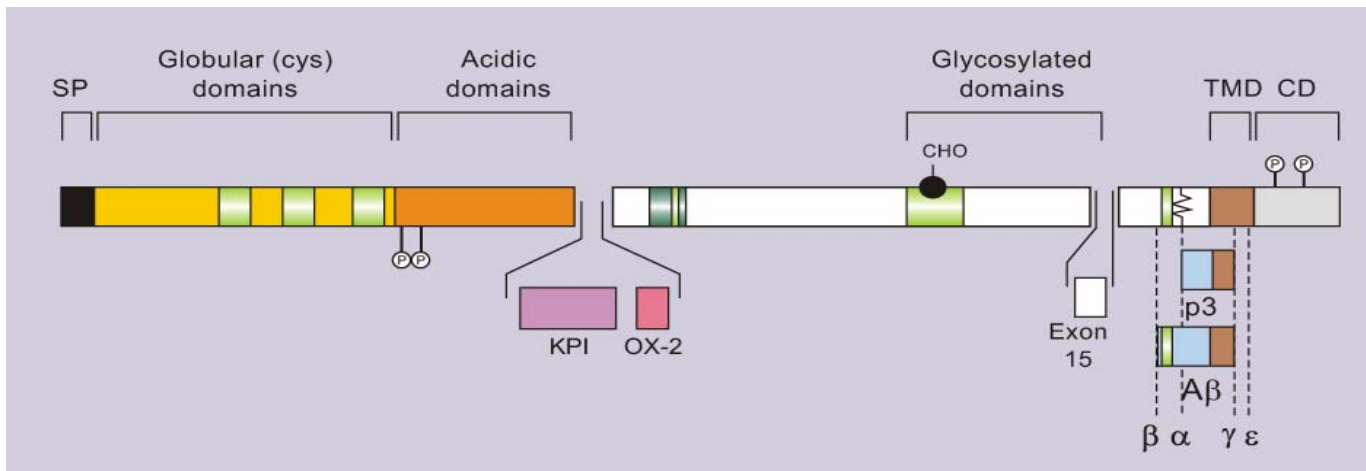
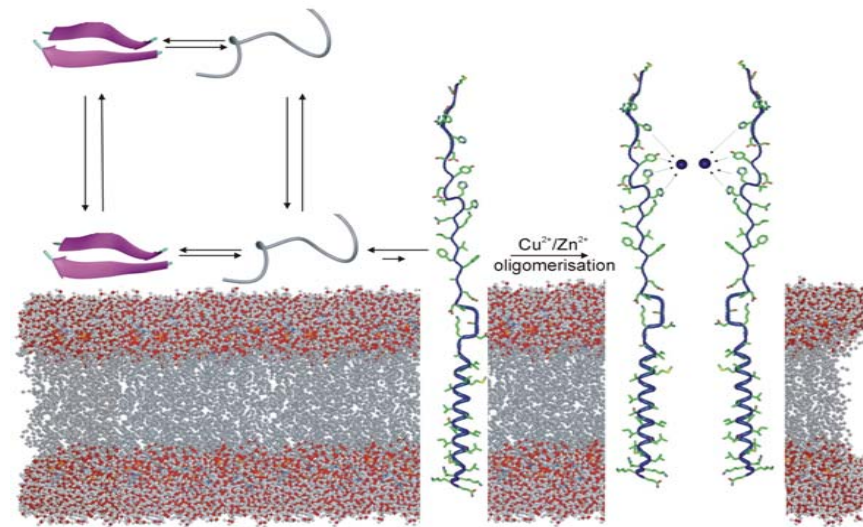


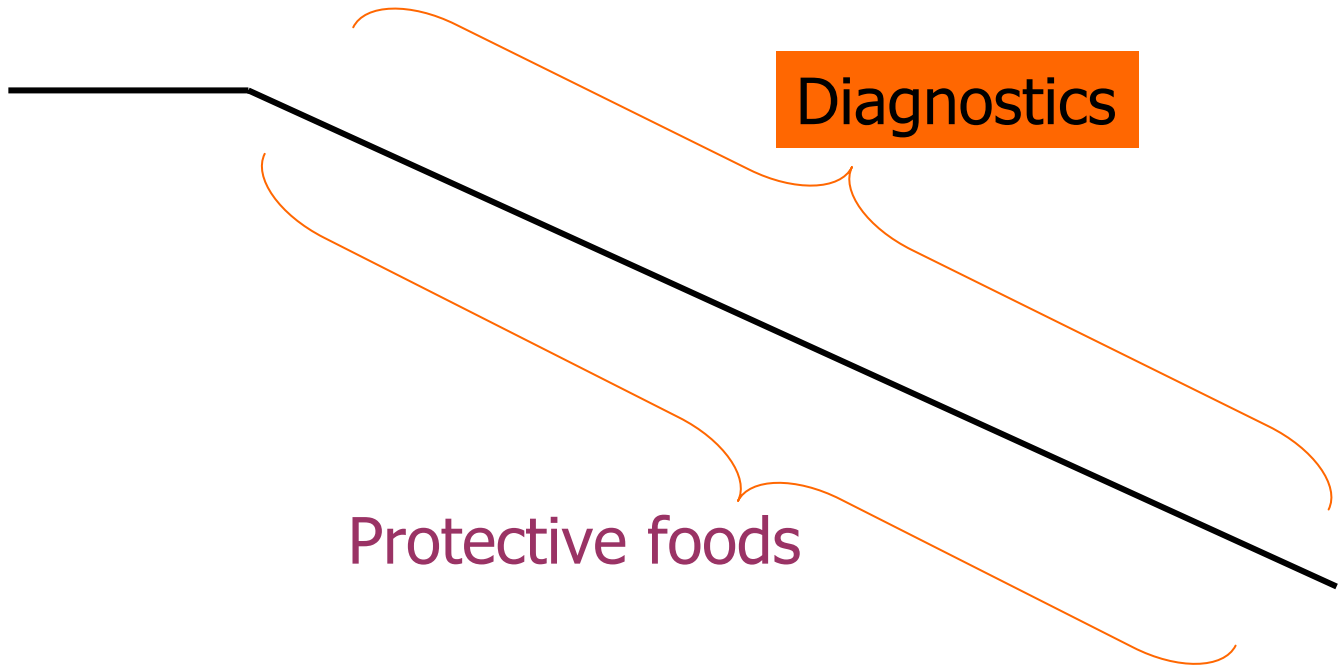
1 Project – 4 Components



β -amyloid and Alzheimer's Disease

- Alzheimer's is caused by an abnormally structured protein
- Need to identify the structure of normal and abnormal proteins
- Work out how this abnormal structure arises, and how it causes disease
- Design drugs to inhibit this process

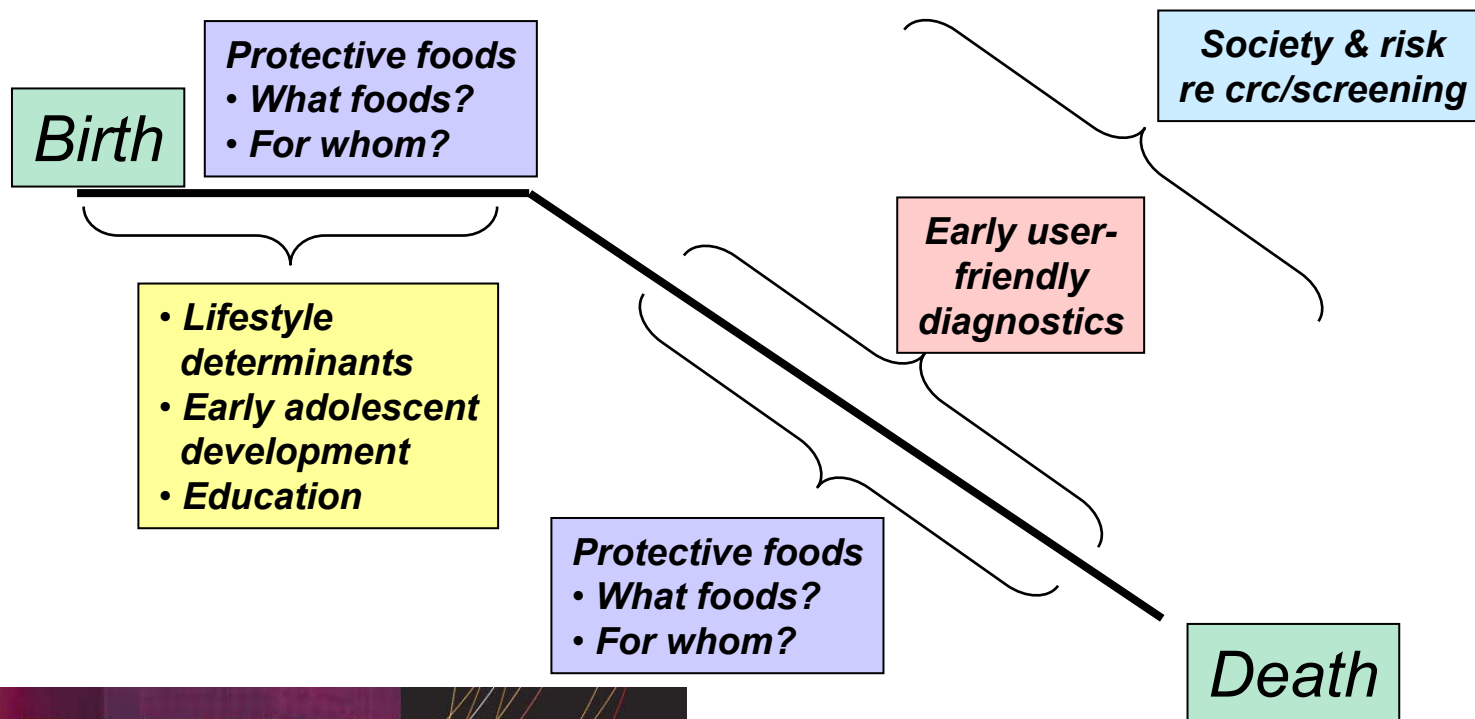




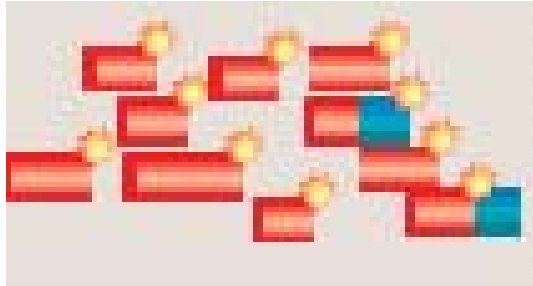
CSIRO

Paradigm: eg colorectal cancer

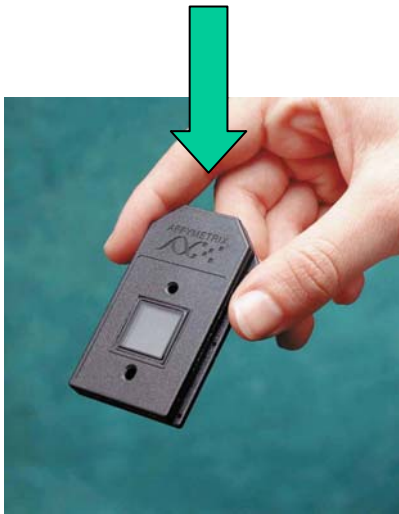
- Numerically one of the most important malignancies (>4,500 annual deaths)
- One in 21 Australians at risk of developing colorectal cancer over their lifetime
- What is the unmet need?
- What is the opportunity to intervene?
- Close clinical, research, commercial partnerships



SNPs and Disease Association



Fluorescent genomic DNA fragments

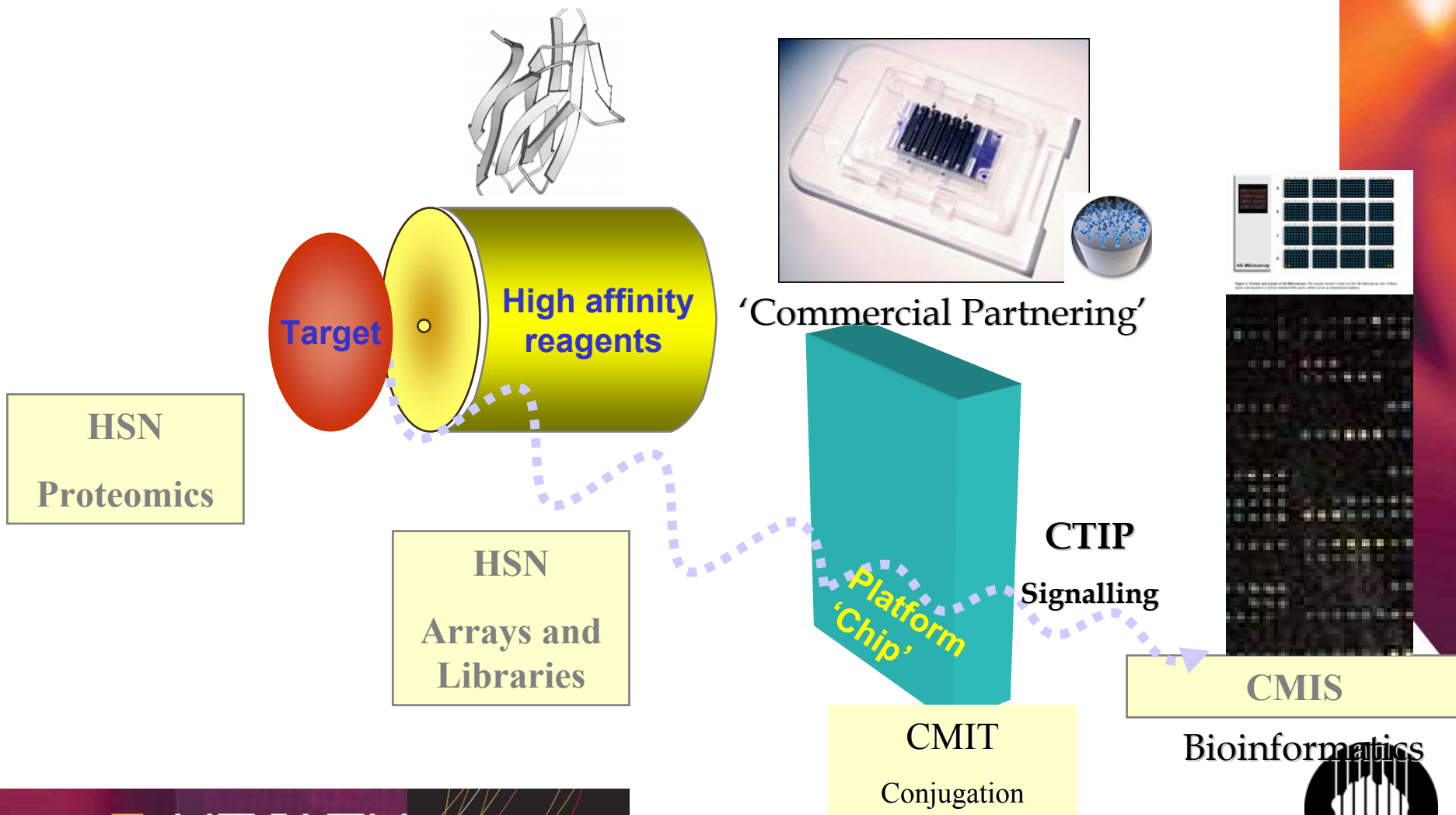


Hybridize to chip that looks at 10,000 variable sites at once

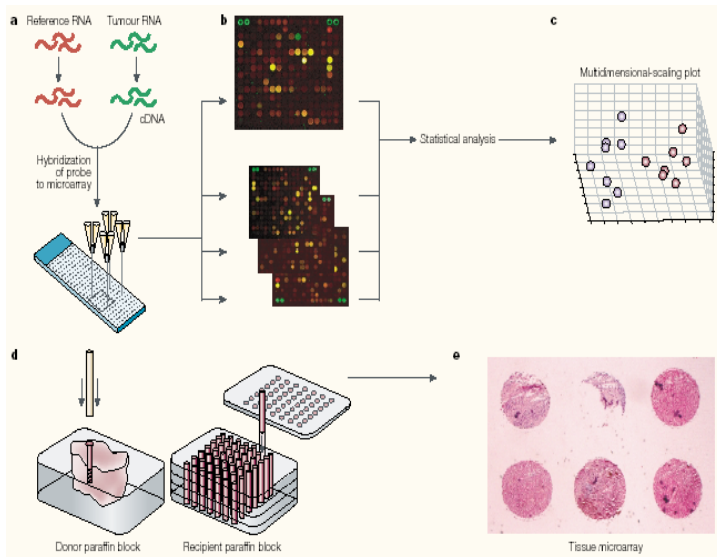


Scan to read genotype at 10,000 Chromosomal locations for diseased and normal individuals

Protein Array Technologies

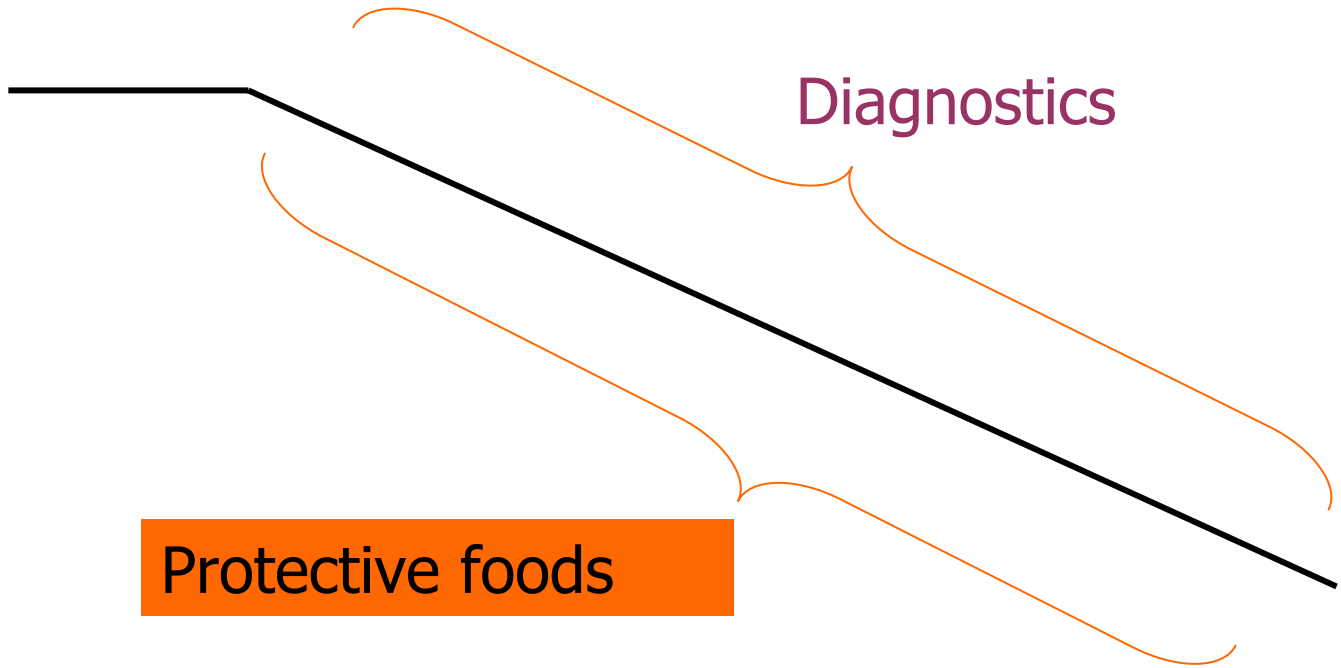


Diagnostics



- **Genetic analysis of colon cancer risk**
- **Diagnostic and prognostic development**
- **A biochip for colorectal cancer**
- **Libraries**
- **New generation diagnostic**
- **Novel biosensors for colorectal cancer**
- **Diagnostics from molecular biology of colorectal cancer**
- **Colorectal cancer statistics & bioinformatics**

- **Biomarkers, genetic**
- **Biomarkers, protein**
- **New high affinity agents and scaffolds**

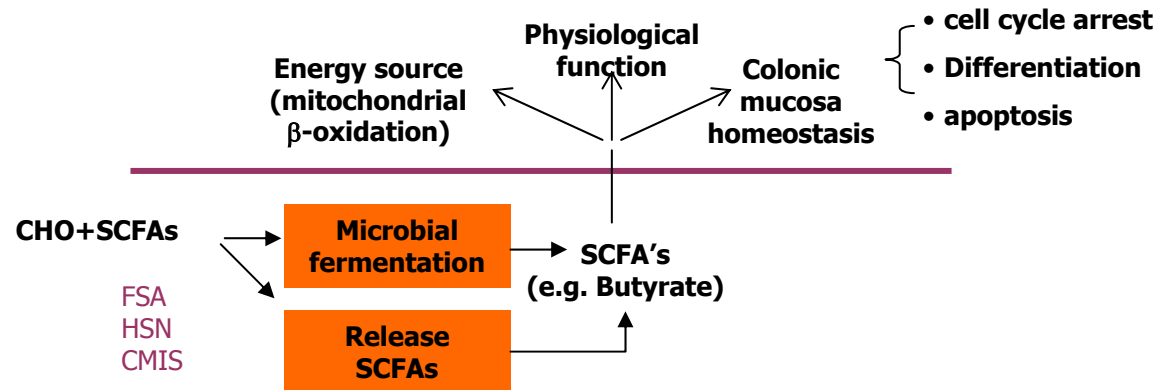


Health data integration/Lifestyle determinants

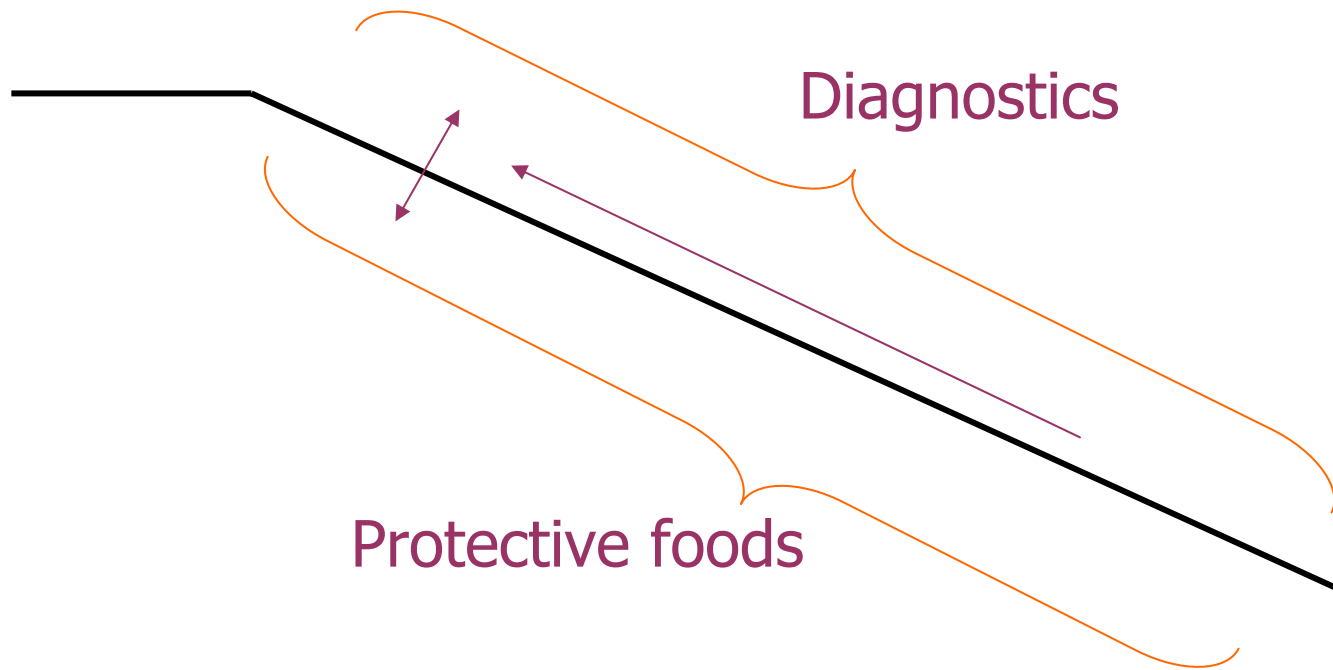
Food and Nutrition

• Protective Foods: Colorectal Cancer

- Starplus
- Microencapsulation
- Butyrate variation and microbiology
- Impact of dietary components on genetic expression



Colorectal Cancer

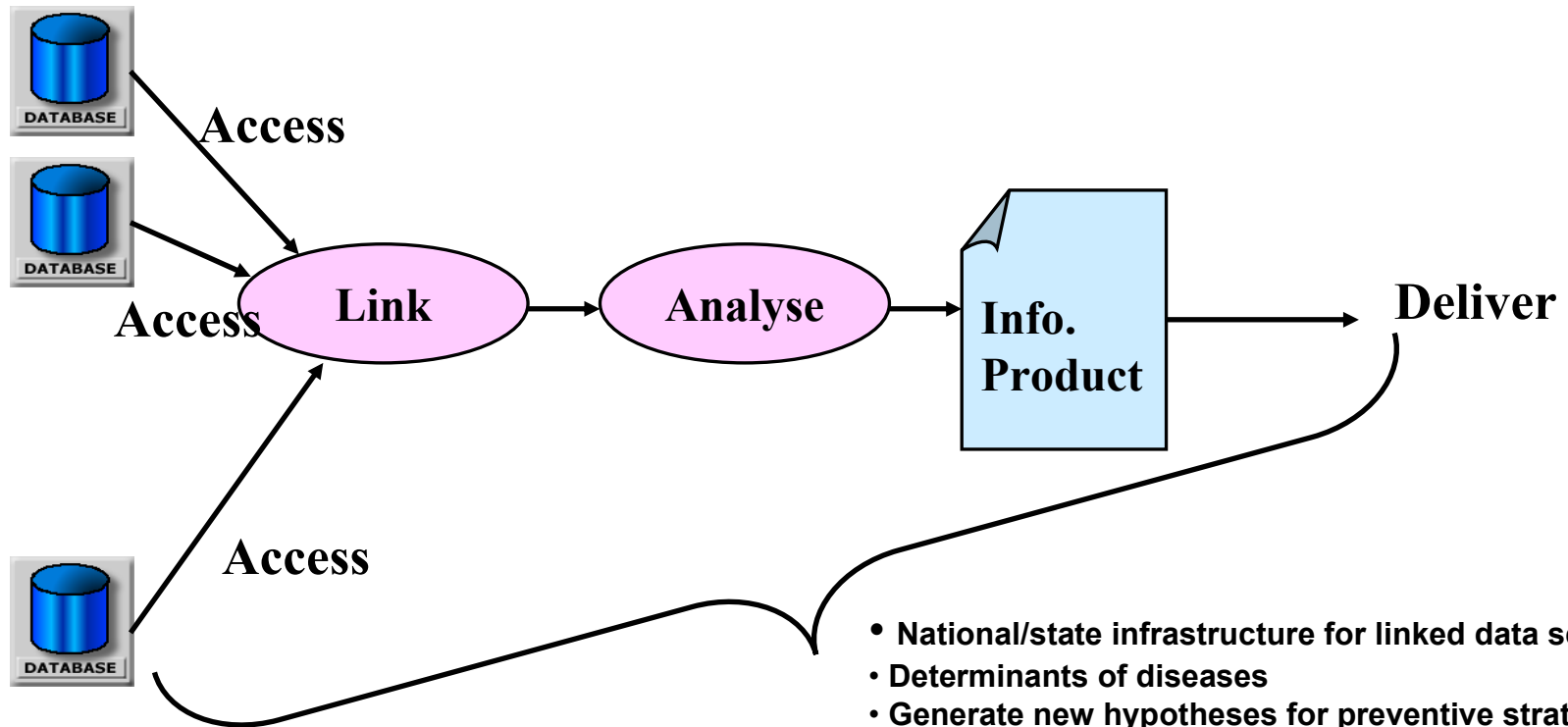


Health Data Integration

/Lifestyle Determinants

Health Data Integration

Convergence ICT, mathematics, statistics, epidemiology, privacy, security
Combining web services and grid technology



- National/state infrastructure for linked data sets
- Determinants of diseases
- Generate new hypotheses for preventive strategies
- Patterns of disease and risk factors
- Guide strategy for molecular epidemiology
- Inform policy and guidelines

The P-Health partnership is -

- Developing new foods and diets which combat disease and promote well-being;
- Developing new ways to identify disease before it becomes serious;
- Using genes and proteins to predict and prevent ill-health;
- Developing powerful new tools to analyse the causes of disease and ill-health;
- Developing better ways to measure and monitor the nation's health and key health issues.



P-HEALTH

THE FLAGSHIP PROGRAM

VISION

helping Australians live longer, healthier lives through early diagnosis & prevention