RIGHT TREATMENT, RIGHT PATIENT RIGHT TIME!

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Outline

• Genes and Cancer
  • Ovarian Cancer
  • Breast Cancer
What’s a gene?

30,000 Instructions in DNA - Genes
Alterations in the DNA Instructions = Mutations
Cancer Involves Multiple Gene Mutations

Heat oven to 180°C. Put 200g flour, 8 tablespoon cocoa powder, 2 teaspoon baking powder, 1 teaspoon bicarbonate of soda, 280g light brown soft sugar in a bowl.
The Problem

- Cancer is a complicated disease with many genetic abnormalities.
- Cancers arising from the same anatomical site can be very different between patients.
  - at least 10 types of breast cancer
  - at least 5 types of colon cancer
- Traditionally most cancer therapies are given as a one size fits all.
The Solution: Personalize Treatment Using Biomarkers

Biomarker: something you measure to predict how a disease will behave with treatment
How do you Find A Biomarker?
Colour = Genetic profile of a patient tumour
Sorting by genomics

- Carboplatin
- Paclitaxel
- Trial
- No treatment
- Different Disease
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Ovarian Cancer

• 225,000 new cases of ovarian cancer worldwide in 2008, accounting for around 4% of all cancers diagnosed in women
• Believed to arise from fallopian tubes
• Usually has spread at diagnosis
• Treatment is surgery with paclitaxel and carboplatin chemotherapy (for over 15 years)
three main objectives:

1. Identify the different types of high grade serous epithelial ovarian cancer using genetic analysis

2. Work out what makes them different

3. Find therapies that work for specific types
Research CCRCB/Almac

• Analysed 287 high grade serous ovarian cancer samples with Edinburgh University
• Identified the different types
Gene Expression Analysis Identified Three Types of High Grade Serous Ovarian Cancer
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Angiogenesis

• Cancer needs to make its own blood supply to grow.
ALM201

- QUB and Almac scientists have developed a new drug that destroys blood vessels in cancer (ALM201)
Gene Expression Analysis Identified Three Types of High Grade Serous Ovarian Cancer

Test for Angiogenic Ovarian cancer
ALM201 study Phase I

First relapse ovarian cancer

Angiogenesis test

Positive
ALM201

Negative
Standard therapy

Radiological Response
Progression free survival

Richard Wilson: ECMC Belfast
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Breast Cancer Test

• Although chemotherapy can help cure breast cancer not all patients benefit.
• Almac collaborated with CCRCB to analyze over 400 breast cancer samples to better understand the disease.
• Have developed a test that can personalize chemotherapy on an individual basis.
DDRD Test Predicts Benefit from DNA Damaging Chemotherapy

- Health Economic analysis has shown the test to be cost saving
Clinical Use of The DDRD Test

Patient has Surgery to Remove Breast Cancer

Pathologist Diagnoses Early Cancer

Apply DDRD Test

Positive

DNA-damaging Chemotherapy

Negative

Other Chemotherapy
SUMMARY

Understanding how the DNA “recipe” changes will help us choose the
- Right Treatment
- Right Person
- Right Time

May lead to new treatments through a better understanding of ovarian and breast cancer