
 **WOOD FORUM** 2016 

Making Sense of Precision Medicine in Arthritis*

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* check against delivery



Outline

- **What is precision medicine (PM)?**
- **Why is it important?**
 - **What are the compelling reasons to do PM?**
- **How does PM impact patients with arthritis?**
- **Can our health care system afford PM?**
 - **What is the VALUE PROPOSITION**

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Precision Medicine: AKA

- Precision Health
- Personalized Medicine
- Prospective Medicine
- Prescriptive Medicine
- Designer Medicine
- Molecular Medicine
- Individualized Medicine
- Theranostics: Therapeutics/Diagnostics
- Translational Genomics

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Central Tenets of Precision Medicine

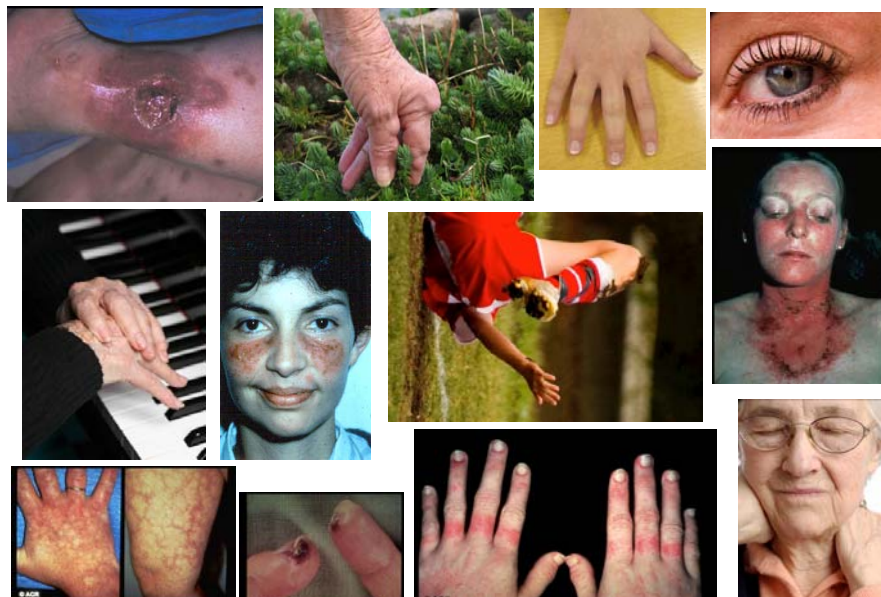
- Disease **PREVENTION**
 - Most important: mainly lip service
- An **EARLY & ACCURATE DIAGNOSIS**
 - Rarely considered important
- Effective **TREATMENT**
Four R's:
 - Right patient
 - Right medication
 - Right dose
 - Right time

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WHY IS PM IMPORTANT?

What are the compelling cases for PM?

**The Challenge for Doctors in Diagnosing and Treating Arthritis:
over 100 different forms with a variety of signs & symptoms...**





Compelling Case Morbidity & Mortality

- News Item: "787's are crashing every 2-3 days and all on board are killed."
 - Implication: If this continues, ~100,000 people will die in 787 air crashes this year.
- Adverse drug reactions =
2 million/year: 100,000 die*
- Sept 20, 2011: More people die from drug related deaths than motor vehicle accidents**
- **Conclusion: Trial and error approaches to therapies must change.**

Sources: * Denis Cortese former CEO Mayo Clinic
** Corus News Network 20/09/11

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Take The Guesswork Out of Your Golf Game

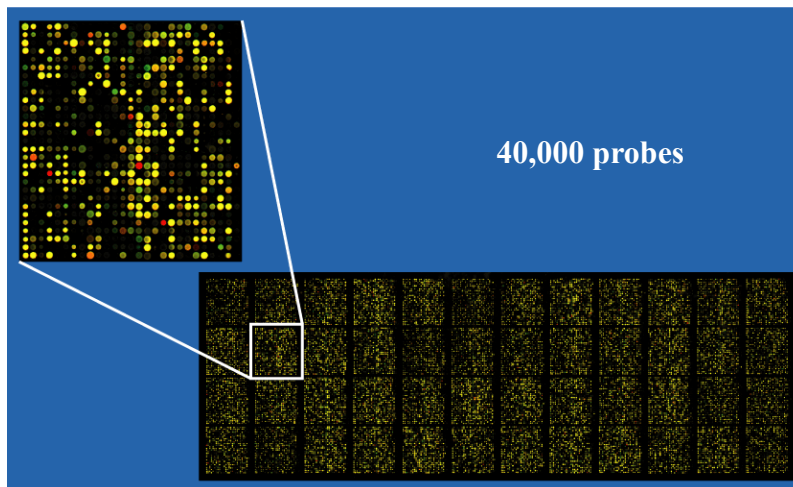


BIOMARKERS are at the heart of PM: #1. The GENOME/genes/DNA



3.2 billion base pairs: >1 billion bits of information

DNA Microarray Chips



Genetics of Arthritis

- Genetic markers for many forms of arthritis have been identified.
 - OA: *interleukin-1 receptor antagonist (IL-1Ra) gene*
 - RA: *HLA-DRB1 variants*
- **BUT, main challenge is that if you have a genetic marker for arthritis, the likelihood that you will develop that form of arthritis is not high enough to make a difference to disease prevention or treatment.**
 - Exception may be HLA B27 is ankylosing spondylitis.
- That is why other (blood) biomarkers are needed.
 - The **PROTEOME** = >20,000 proteins



≠ DESTINY

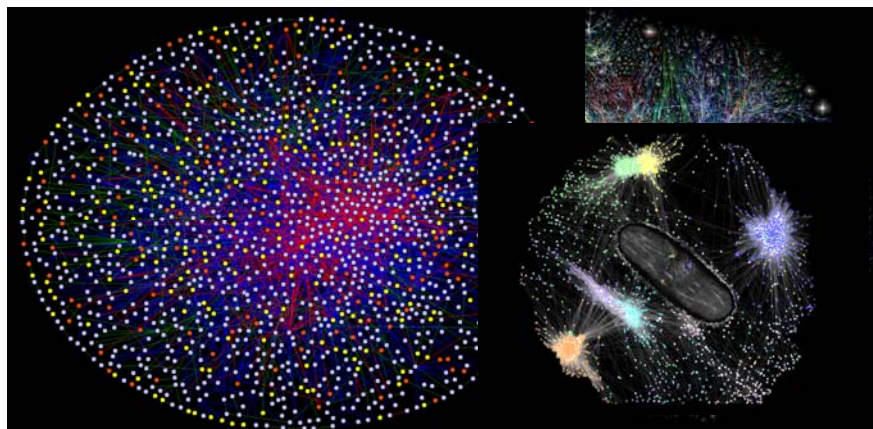
**Your genome determines your
POTENTIAL
not your
DESTINY.**

YOU can control your health.

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Biomarkers #2

The PROTEOME: Connections between PROTEINS



[From: delcafepombo.blogspot.com](http://delcafepombo.blogspot.com)

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Clinical & Experimental Immunology
The Journal of Translational Immunology



Clinical and Experimental Immunology

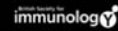
ORIGINAL ARTICLE

doi:10.1111/j.1365-2249.2008.03691.x

Protein biochip array technology for cytokine profiling predicts etanercept responsiveness in rheumatoid arthritis

Fabre S, Dupuy AM, Dossat N, et al. Clin Exp Immunol 153: 188, 2008.

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The Journal of Translational Immunology



Clinical and Experimental Immunology

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Protein biochip array technology to monitor rituximab in rheumatoid arthritis

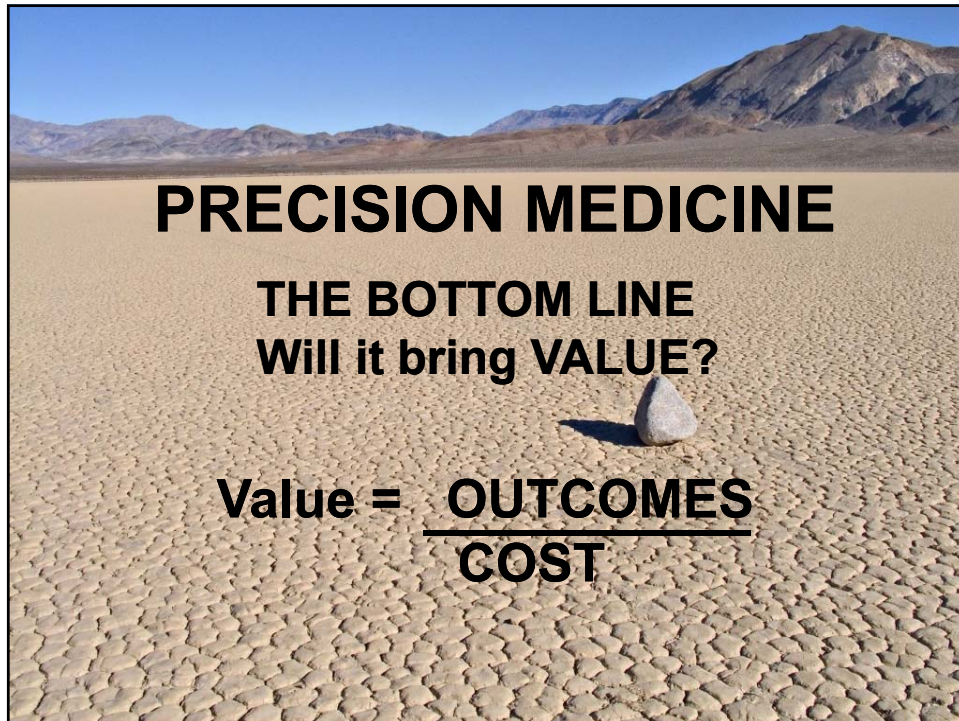
Fabre S, Guisset C, Tatem L, et al. Clin Exp Immunol 155: 395, 2009.

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Precision Medicine

What will it mean if you have arthritis?

1. **Early & accurate diagnosis**
2. **Take the guesswork out of treatment —**
5 R's
3. **But, will it cost more? What is the “value proposition”?**



PRECISION MEDICINE

THE BOTTOM LINE
Will it bring VALUE?

Value = $\frac{\text{OUTCOMES}}{\text{COST}}$



OMEGA — Ω

THANK YOU