



Personalised Medicine: Data Science Opportunities

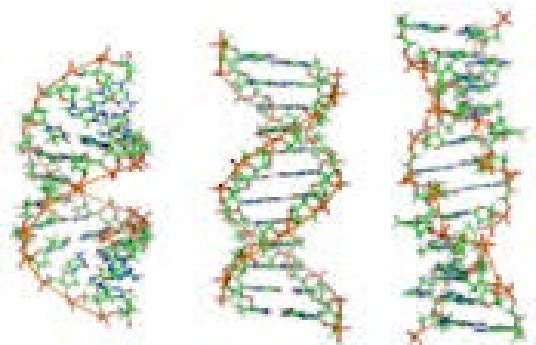
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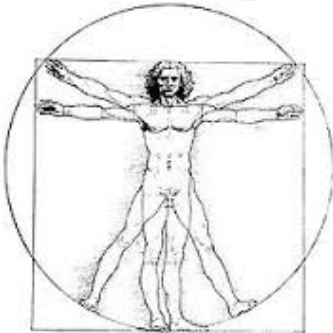
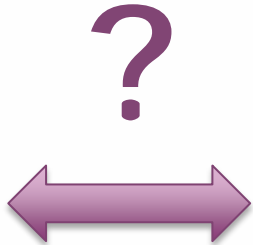
Personalised medicine: The need

- Current biomedical knowledge predicts < 30% of health outcomes
 - E.g. statins: We treat 20 patients to save 1 life.
- Must move away from "one size fits all approach" in clinical medicine
- Inspired by uniqueness of each individual's genotype
- Similar to "mass customization" in data services
 - E.g. Google search; Facebook; SPAM filters

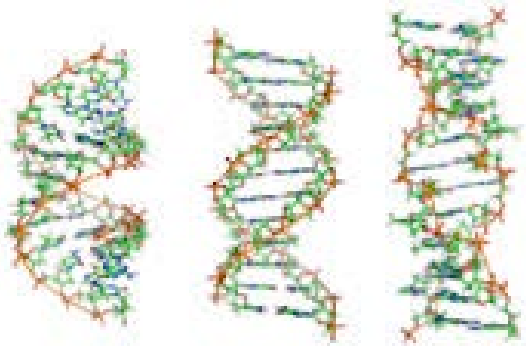
Personalised medicine: The challenges



genome



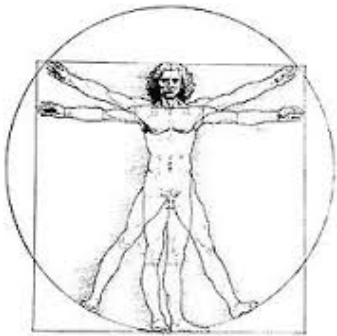
phenome



genome

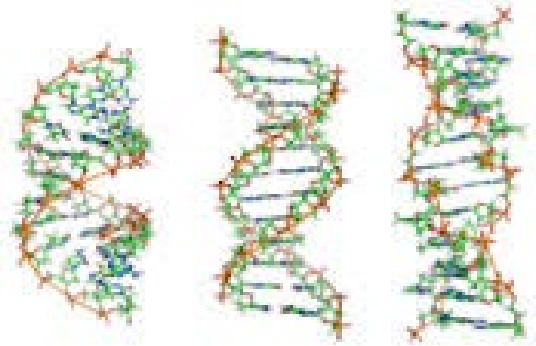


exposome

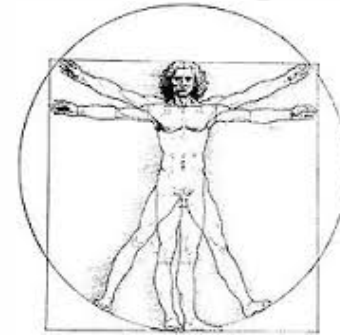
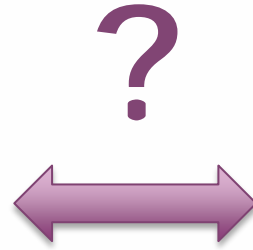


phenome

Personalised medicine: Opportunities (1)



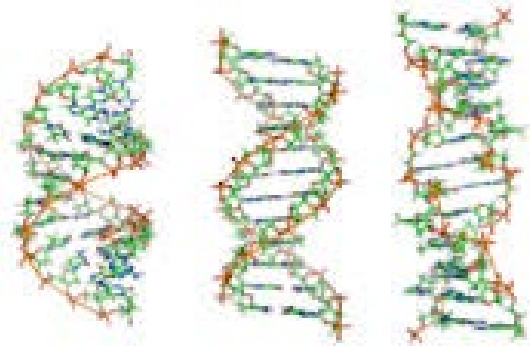
genome



phenome

- < \$1,000 genome era
- use electronic health records for electronic phenotyping
- complex subgroup discovery + mapping exercise

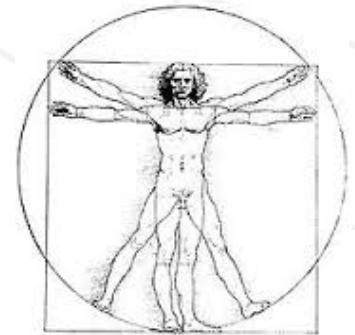
Personalised medicine: Opportunities (2)



genome



exposome



phenome

- Rheumatoid Arthritis: genome predicts 50% of illness severity
- Massive opportunities to measure exposome with Internet of Things
- E.g. find subgroups for whom to prescribe statins + physical activity

Thank you

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