

Institute of Social and Cultural Anthropology



Shifting Disease Classifications and Boundaries of Normal/Abnormal in “Omics” Research Practices

Nadine Levin, DPhil Candidate

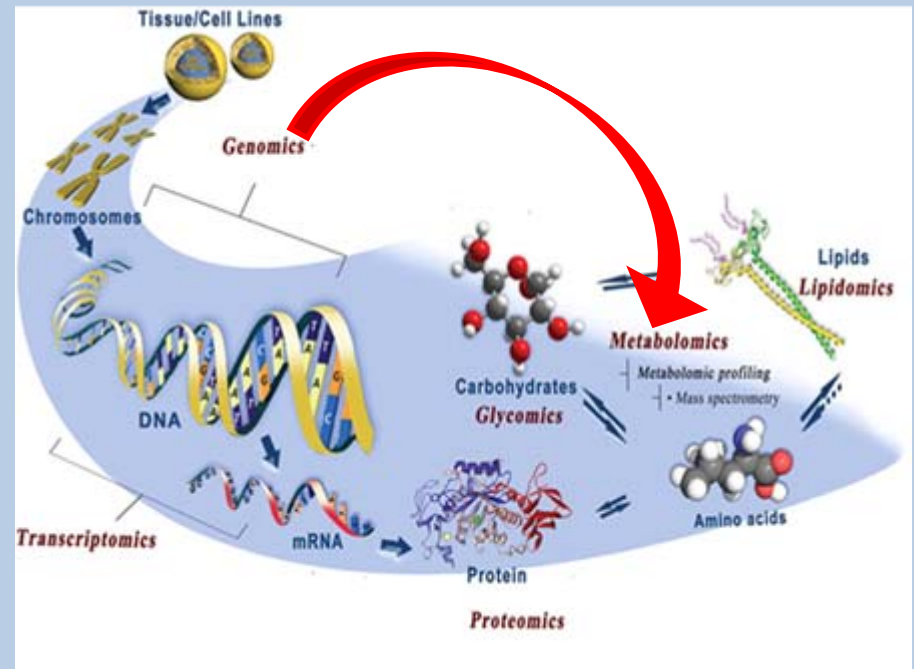
Oxford University

Disease Classification In The “Genomic Era”

- “Genomic era”
 - Human Genome Project: explosion of new knowledge/technologies for medicine
- **How and to what extent** has genomics impacted understandings of disease?
 - What about other forms of knowledge/practices?

Metabonomics: New Views of Disease?

- “Metabonomics”: study of metabolism^{1,2}
 - **dynamic view** of gene-environment
- Statistically measure influences of food/exercise/gut bacteria on health



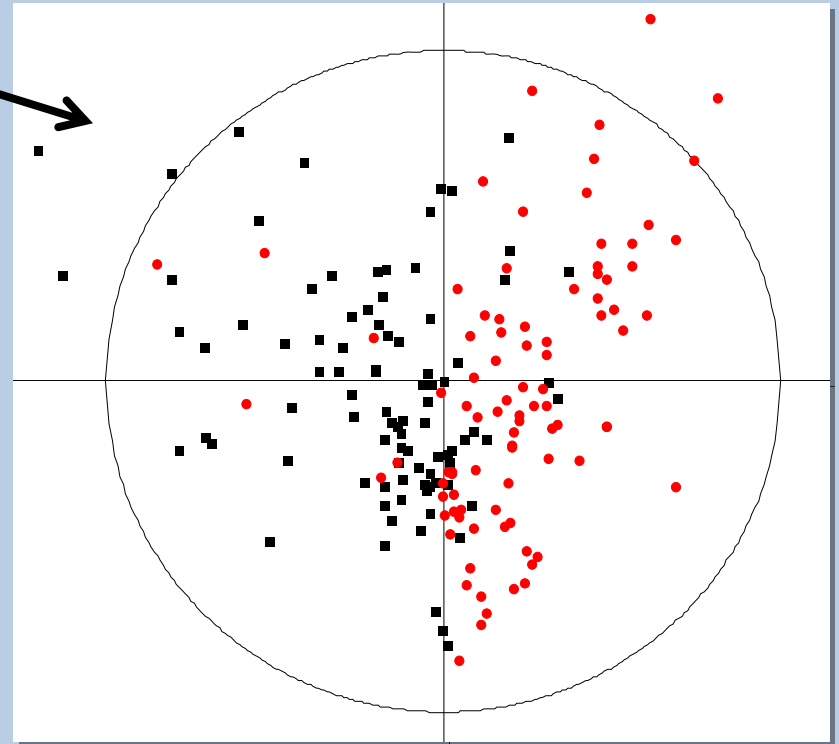
Systems biology:
gene ↔ metabolism

- 1) Nicholson, *Systems Biology: Metabonomics* (2008)
- 2) Nicholson & Lindon, *The Handbook of Metabonomics and Metabolomics* (2007)

Disease Classification in Practice



- Normal Tissue
- Abnormal/Tumour Tissue

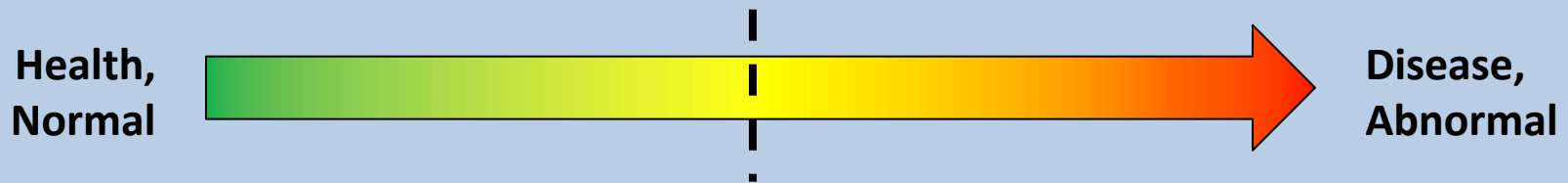


- Imperial College London: **translational/personalized medicine projects**
- MAS-NMR machines: tissue diagnostics

1) “Surgeons get real-time tissue profiling” (2009).
<http://www.nature.com/news/2009/091214/full/news.2009.1128.html>

Why Study Normal/Abnormal in Disease Classification?

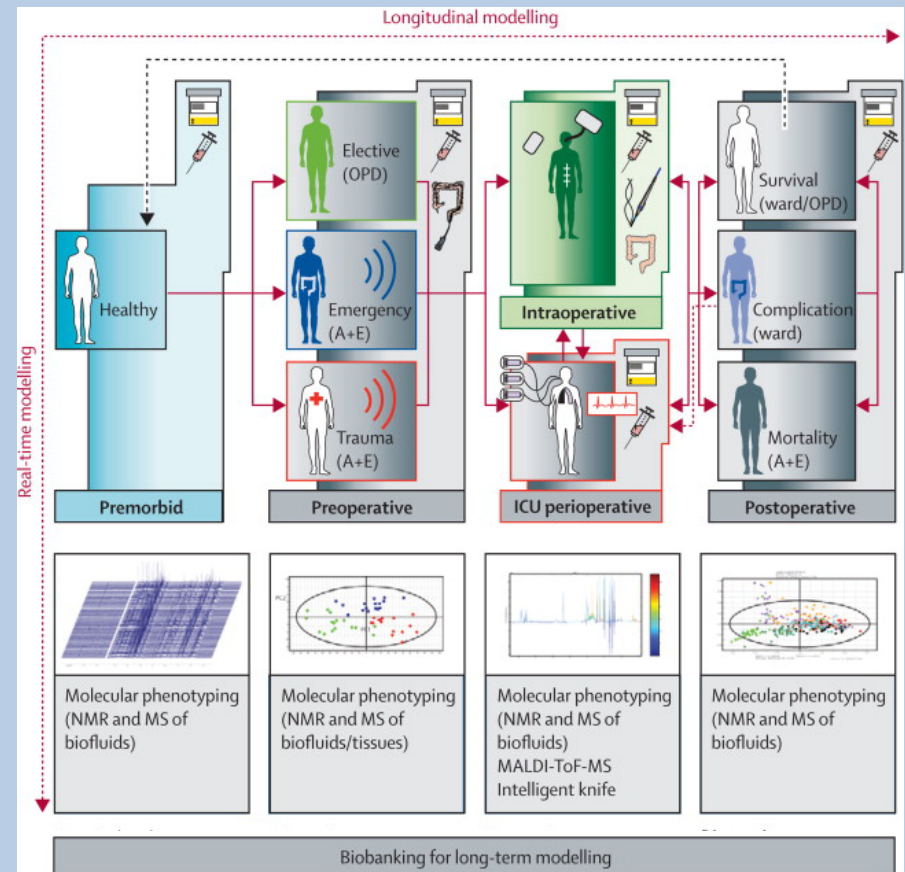
- Health/disease: **statistical continuum** between normal/abnormal¹
 - Job of scientists: negotiate the *statistical point* at which normal turns to abnormal
- Boundaries between normal/abnormal are **shaped by laboratory practices**



1) Canguilhem, *The Normal and the Pathological* (1966)

Experiment: “Metabolic Phenotyping” in Hospitals

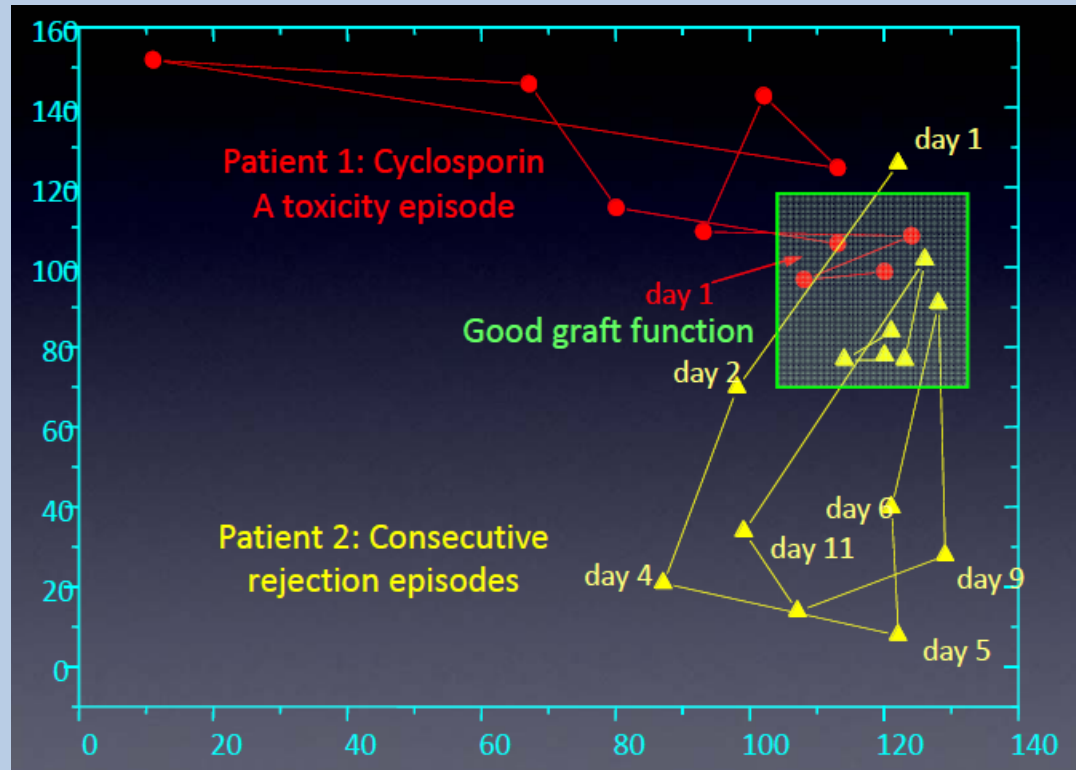
- “Personalized Medicine” according to metabolism^{1,2}
- Monitor patients, predict outcomes
- Information about
 - Individual patients
 - Patient cohorts



- 1) Kinross et al, *Metabolic phenotyping for monitoring surgical patients* (2011)
- 2) <http://clinicaltrials.gov/ct2/show/study/NCT01378013#desc>

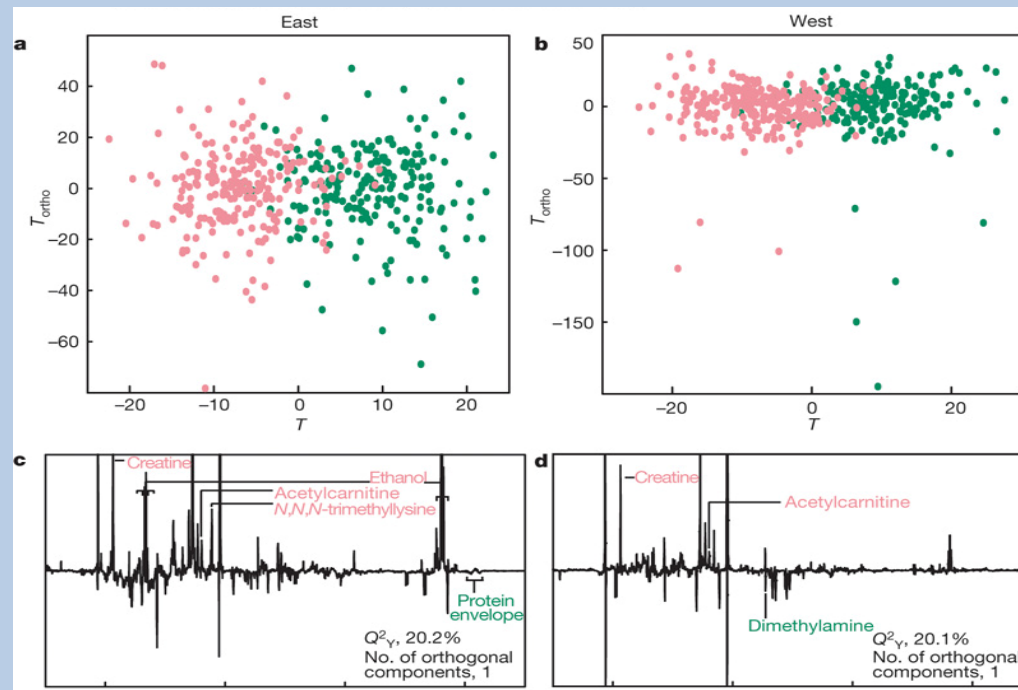


Defining Disease in Individuals



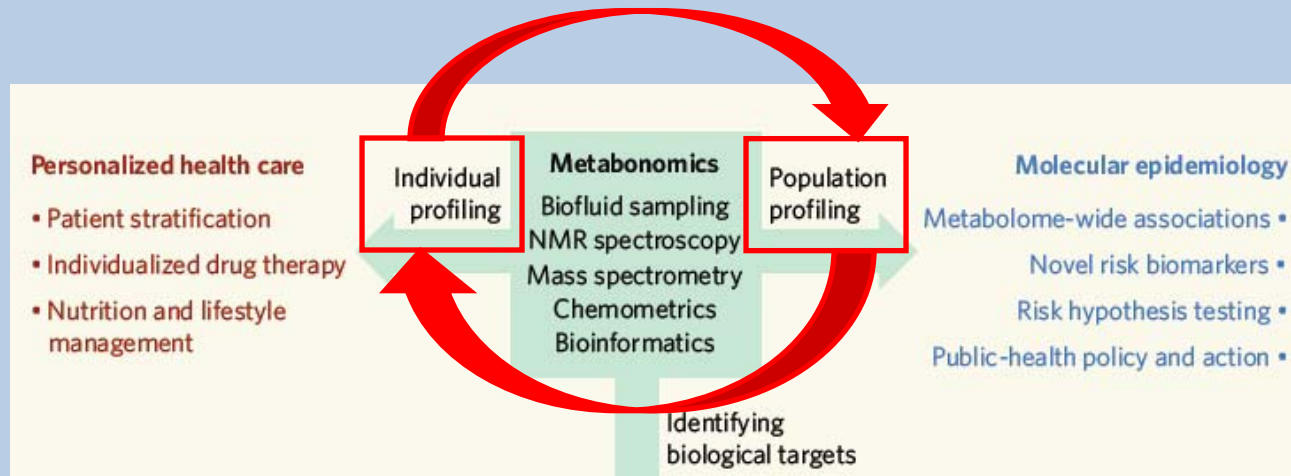
- “Metabolic profile” is biochemical summary of individual’s metabolism
- **Normal: relative to individual, ideal**

Defining Disease in Populations



- “Metabolic profile” is key metabolites that distinguish sub-groups within populations
- **Normal: relative to population, average**

Finding “Normal” in Personalized Medicine



- **Individual monitoring** happens with reference to **population-derived biomarkers**¹
- Tension between health/disease in terms of²
 - Normal as individual/ideal
 - Normal as population/average

1) Nicholson and Lindon, *Systems Biology: Metabonomics* (2008)

2) Hacking, *The Taming of Chance* (1990)

Metabonomics and Disease Classification

- **Local practices** reveal important categories/ideas
 - Disease is enacted in reference to individuals AND populations^{1,2}
 - Disease research in hospital settings involves cost optimization, reducing side effects of treatments
 - Metabolism gives researchers a more dynamic set of tools (than genomics) to measure health/disease

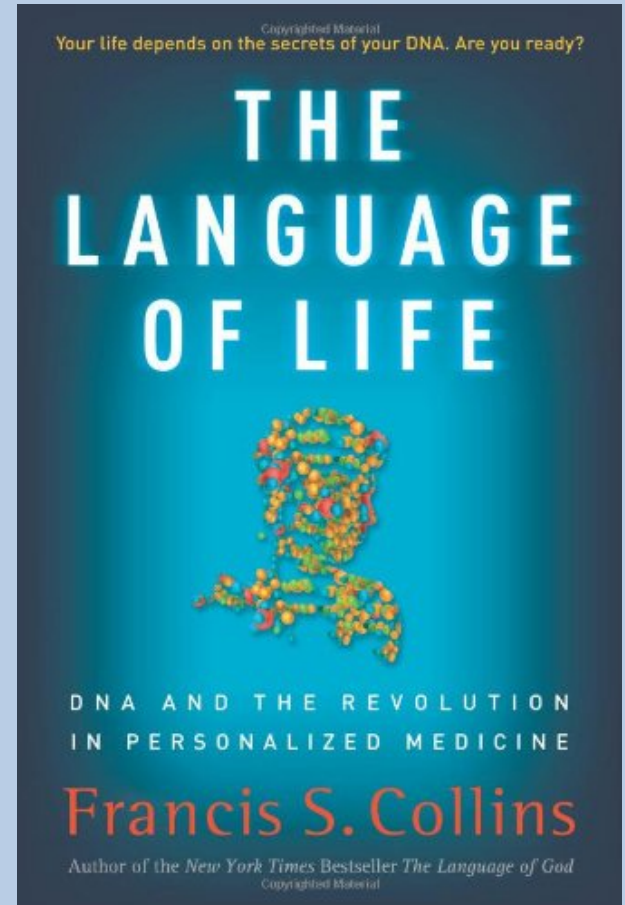
1) M'charek, *The Human Genome Diversity Project* (2006)

2) Raman and Tutton, *Life, science, and biopower* (2010)



Conclusion

- Personalized medicine...
 - How “personal”?
 - New form of “biopower”?
- Suggestion: dissociate rhetoric from practices to examine the precise and local meanings of personalized medicine



Thank You!

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London
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