



# International Symposium on BIOMEDICAL INFORMATICS IN EUROPE

26-27 June, 2007

Satellite Doctoral School – 25 June, 2007



Barcelona Biomedical Research Park, Barcelona

## Session topics

- Systems biology insight into human disease and treatment
- Biocomputation and knowledge management in drug discovery and development
- Data and knowledge mining in biomedical research
- Modelling and simulation in biomedical research
- Standards and ontologies in biomedical informatics
- Case studies of biomedical informatics applications

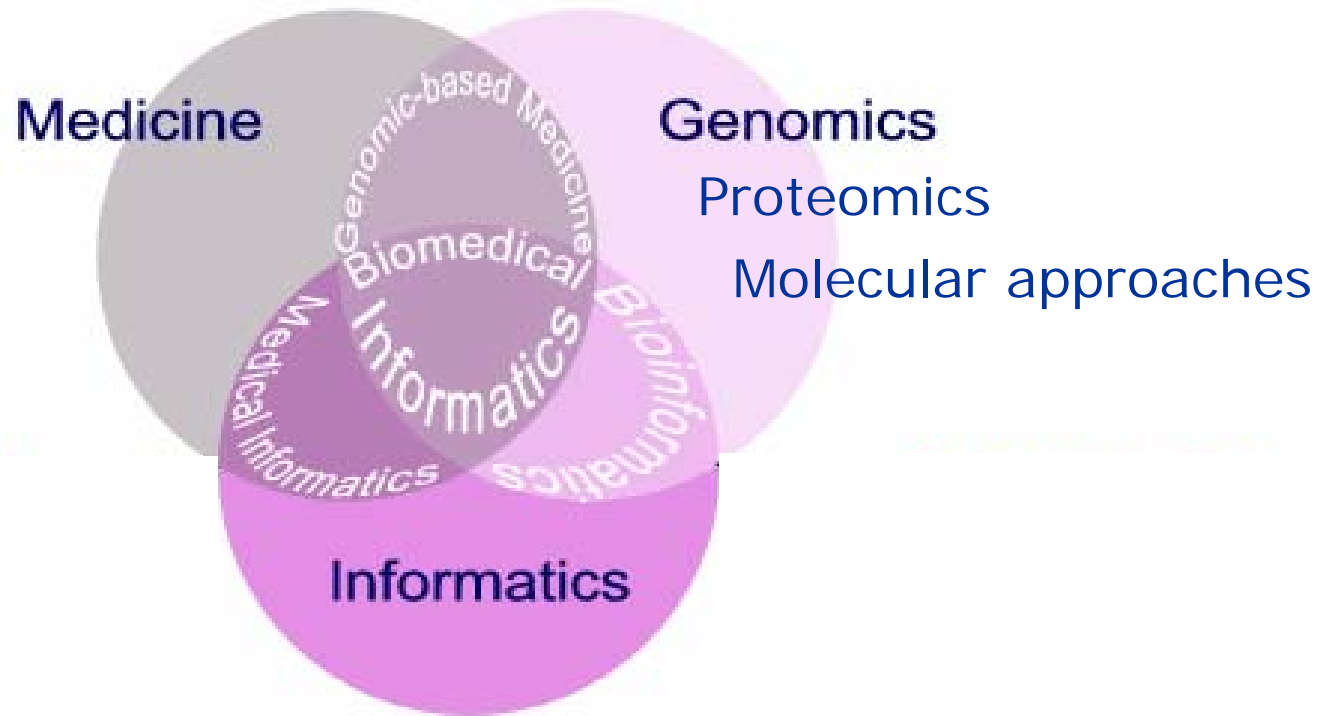
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Adapted from BIOINFOMED white paper

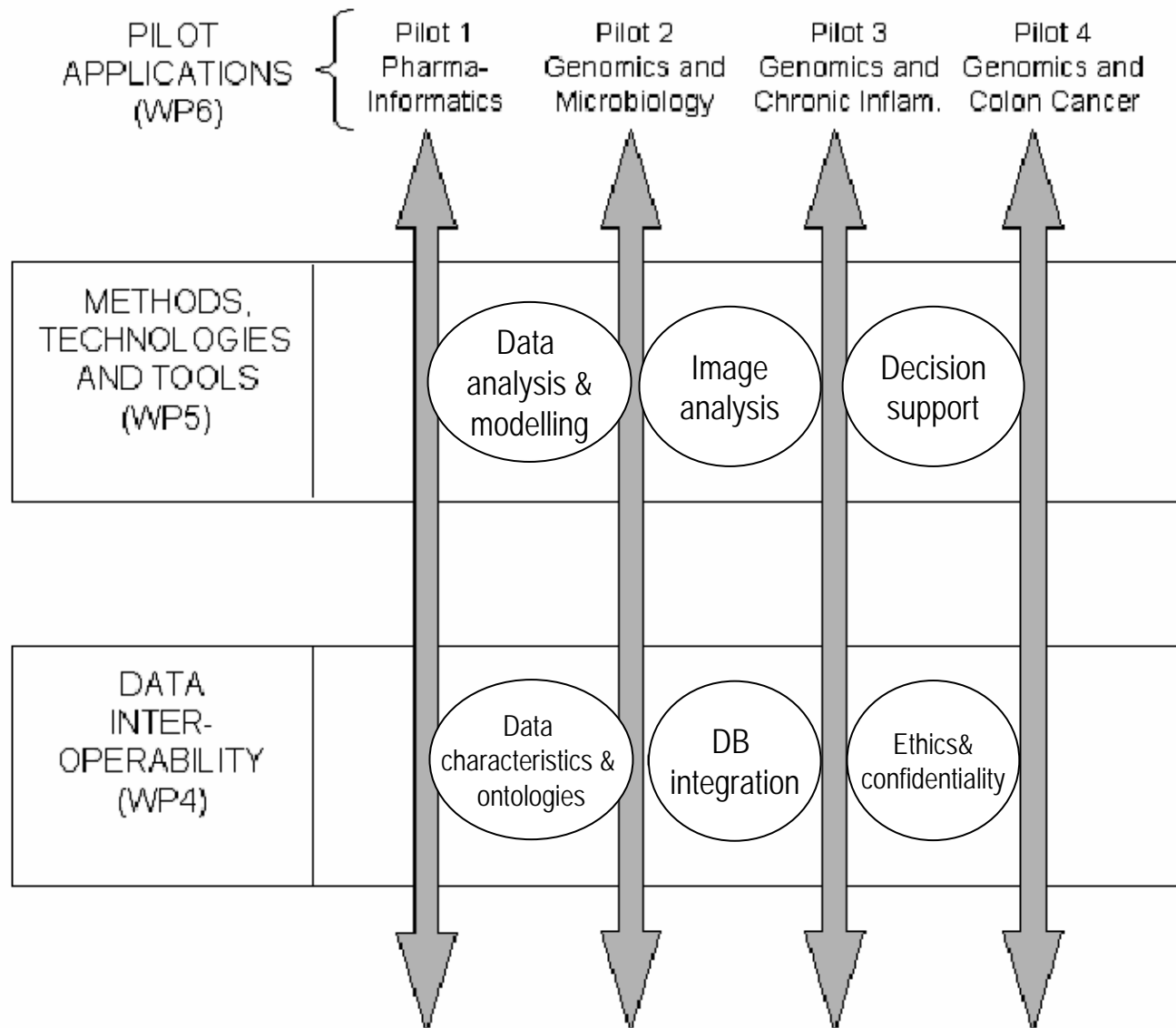


Integration of “omics” and clinical information with preventive, diagnostic and therapeutic purposes

## INFOBIOMED: Structuring European Biomedical Informatics to Support Individualised Healthcare

- **Main objective:** "Set a durable **structure** for **BMI** at the European level that supports its **consolidation** as an **integrative** scientific discipline that exploits the **synergies** between BI and MI" (BI and MI have been separate disciplines up to now).
- **Specific objectives** can be broadly divided in 2 groups:
  - **"Community"**: education, training, mobility, spreading knowledge, creating a self-sustainable structure.
  - **"Scientific"**: data integration; methods, technologies & tools; pilot applications.
- **42 months** starting on Jan 1<sup>st</sup>, 2004.
- **16 institutions** from **10 countries**: IT, BMI, MI & pilot field experts.
- [www.infobiomed.org](http://www.infobiomed.org) & [www.infobiomed.net](http://www.infobiomed.net)

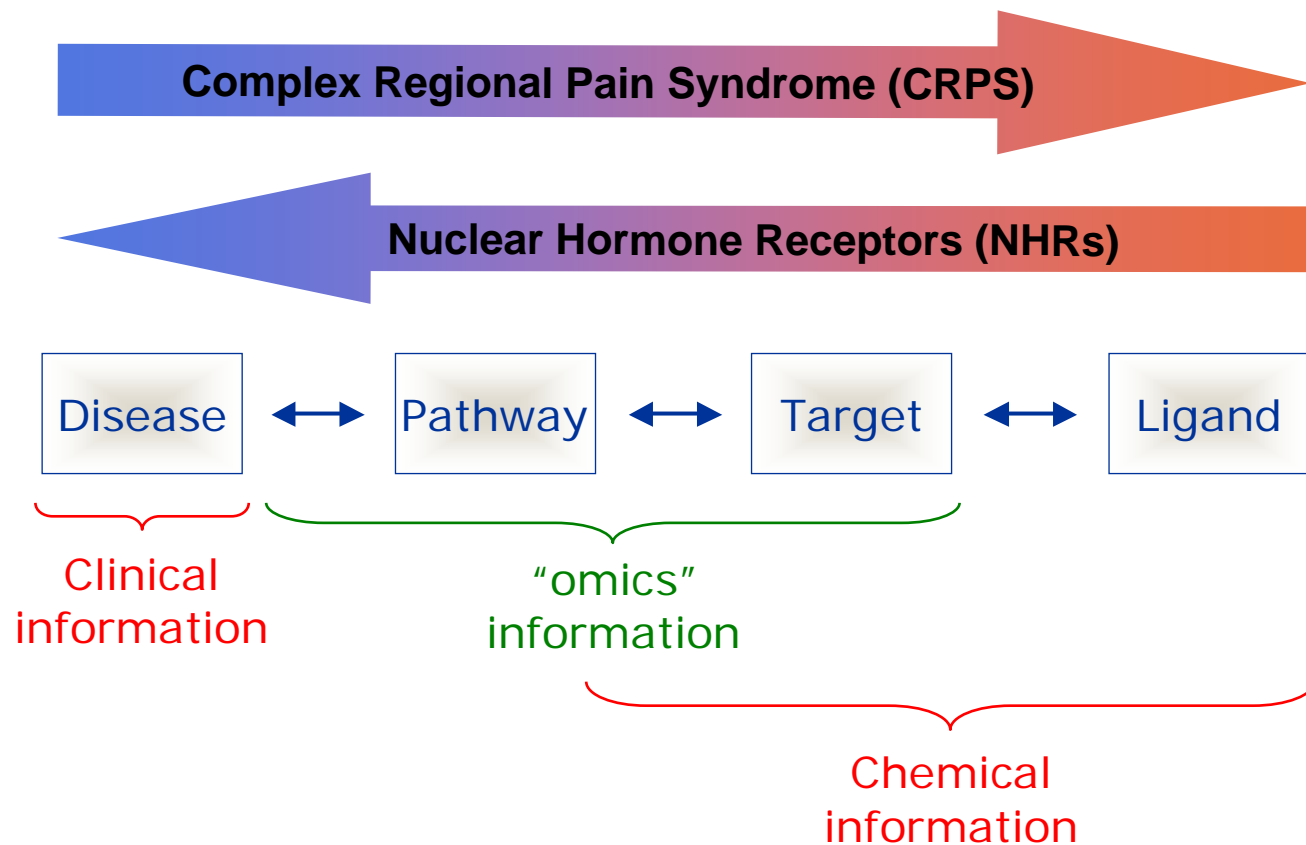
# Joint Programme of Activities



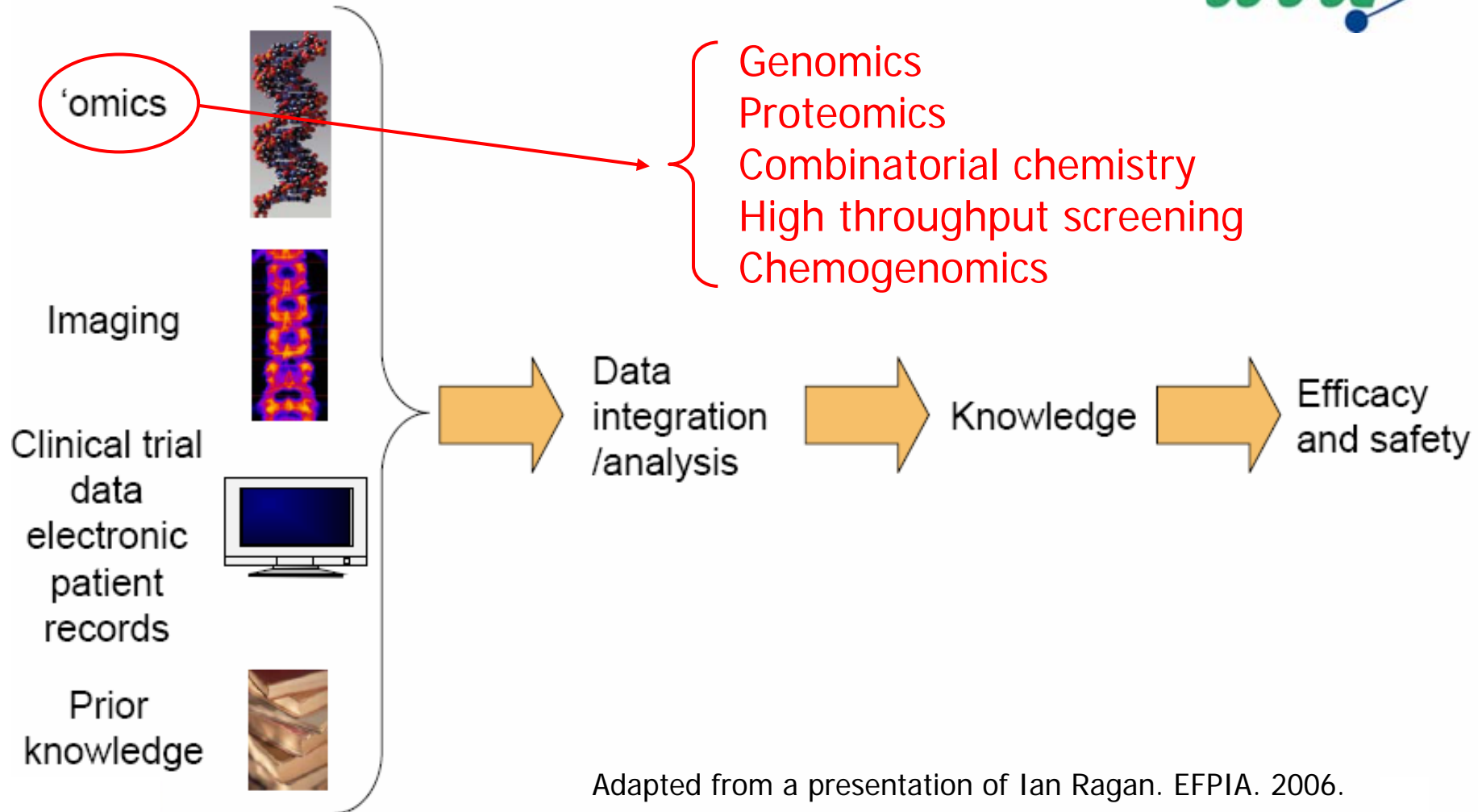
Pilots are the 'proof of concept' of the pursued integrative vision of BMI

**Integration of biomedical information (BMI)** in order to gain a more complete view of a disease, its pharmacological treatment or drug adverse event

Two case studies:



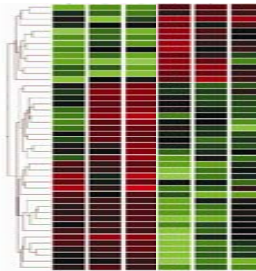
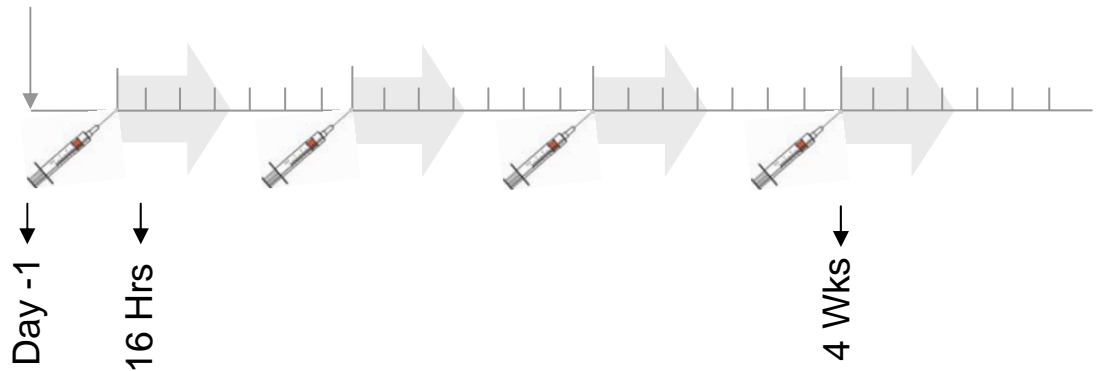
# Innovative Medicines Initiative: Knowledge Management



Adapted from a presentation of Ian Ragan. EFPIA. 2006.

High-throughput analysis combined with a detailed knowledge of **pathway biology** enabling a **patient-specific therapeutic regime**

Patient Sampling  
HCV Genotyping



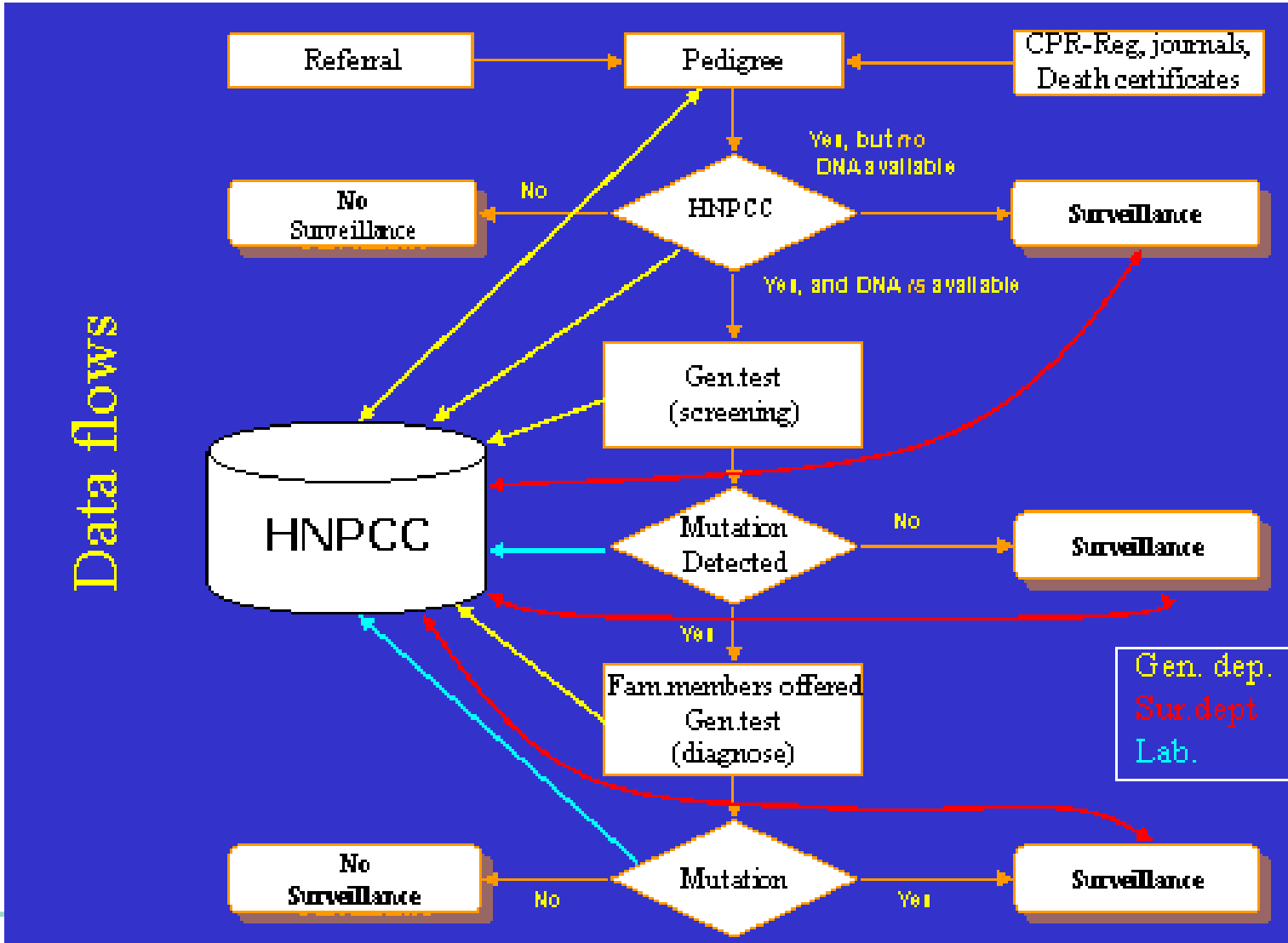
**Genome**  
*transcriptional*  
analysis of **each**  
**patient** at **multiple**  
**time points**

Integration of host and pathogen genomics with clinical parameters for an early discrimination of responders vs non-responders to treatment

**PERIODONTITIS *as an excellent model*  
*of multifactorial complex disease***

- Genetic susceptibility
  - polygenic (modifying genes)
- Infectious component
  - at least 5 periodontopathogens
- Environmental influences
  - smoking, stress, diet
- Relative high prevalence
  - 15% in general population
- Easy access to samples
  - non-invasive sampling
- Patient cooperation
  - no life threatening disease
- Existence of network
  - within universities
  - & universities to specialists

Detection and follow up of families at risk of hereditary colon cancer



Data flows



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