

# PHILIPS

## **New Medical Paradigms**

Dr. Trevor Hawkins  
Chief scientist

Pandora's box has been opened...



A movie is playing at this moment

GATACA. Universal Pictures 1994

# Molecular Healthcare was kicked off in 2000 but will be played out over the next 50 years

## Molecular Diagnostics

The development and commercialization of clinical diagnostic *in-vitro* assays based upon the patients DNA, proteins or other biomarkers. Tests are carried out usually on blood, serum, bodily fluids at a central lab and results returned to the physician

## Molecular Imaging

The development and commercialization of clinical *in-vivo* assays based upon the patients DNA, proteins or other biomarkers. Tests are carried out in the hospital using various diagnostic imaging systems – PET > SPECT > MR > ULTRASOUND > OPTICAL



*“What ever will we think about now that the genome project is almost complete?”*

## Taking Molecular Healthcare to the patient *Only Philips*



Molecular Diagnostics &  
Molecular Imaging are all  
about the patient  
*Your Biomarkers*

It will break down the walls  
of the hospital

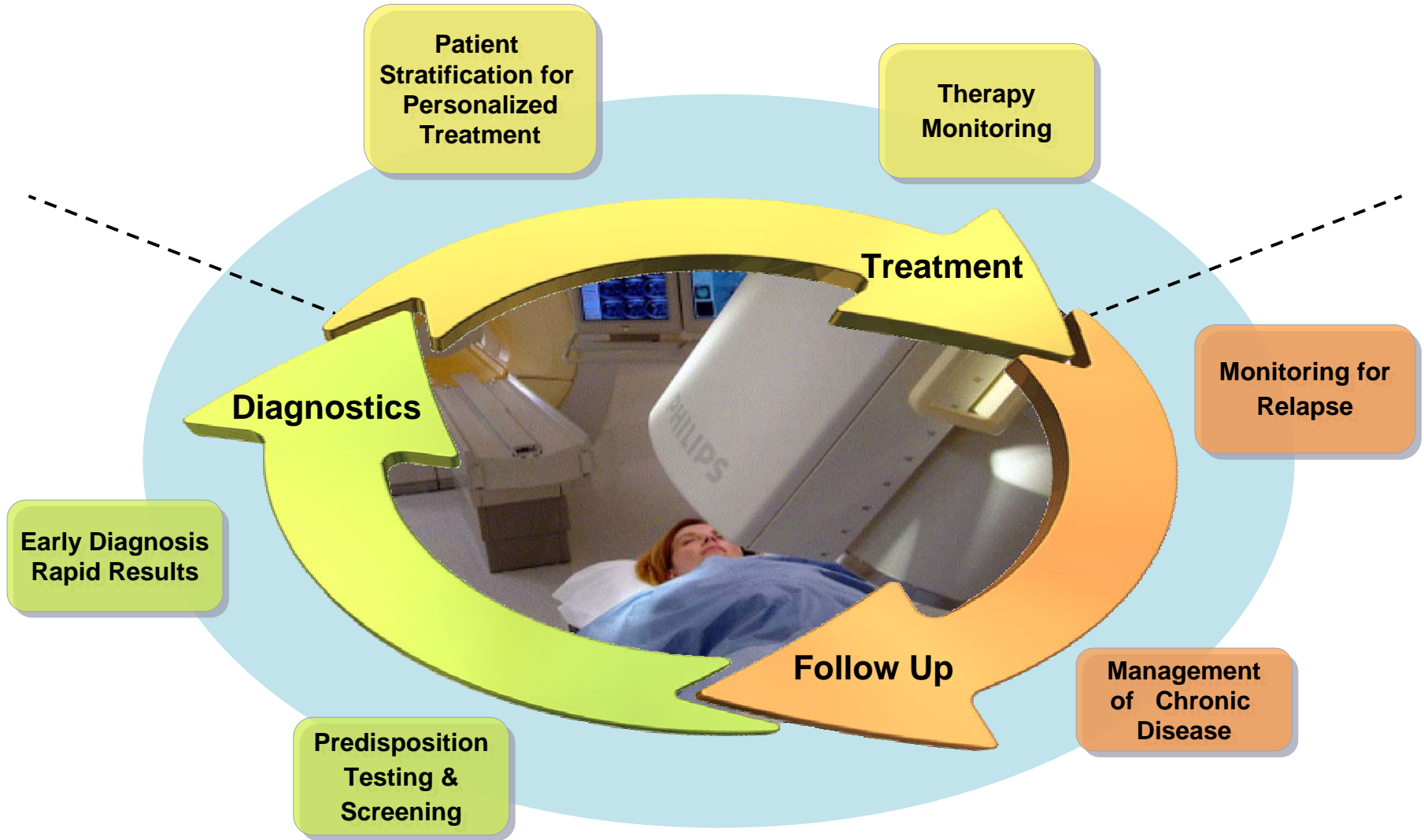


Introduce environment and  
continual awareness as a  
vital health tool



Combine simplicity,  
practicality and become as  
accepted as daily  
consumer electronics

# Focus on the Care Cycle – Molecular Healthcare



# Vision on Health(care): Paradigm Shifts

From imaging to targeted diagnostic imaging

- expansion into other parts of the care cycle
  - from imaging & patient monitoring to therapy support, guidance, drug delivery solutions, implantables

From organ to cell and molecule

- early detection and personalized treatment
  - from morphology and treatment at organ level to unraveling biological functions and disease pathways at the molecular biology level

From hospital centric to patient centric

- solving the healthcare system crisis through empowered consumers
  - enabling prevention, home care, self care, remote patient management

# Molecular Healthcare

The Philips approach will draw on strengths & brand

Align with the patient, payor & physician



- Drive the market change from screening to patient care
- Reimbursement, validation & education will drive uptake

Create a technology pipeline



- Combine the Philips platform approaches into clear strategy
- Drive patient centric care approaches

Partner & fill gaps



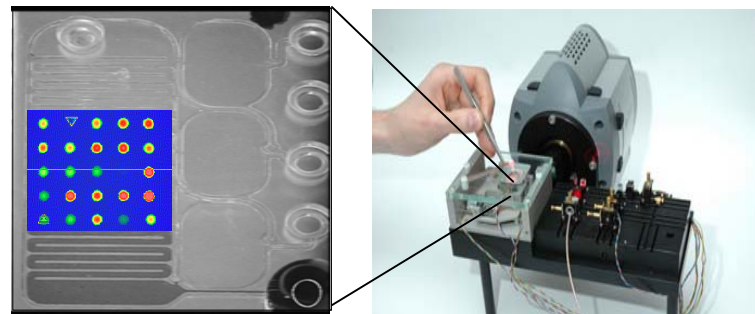
- MDx adoption will be driven by link to a drug
- Drive the adoption through alliances with big pharma

*Marketing & customer education will be as important if not more than the technology itself*

# Our Strengths in Molecular Diagnostics

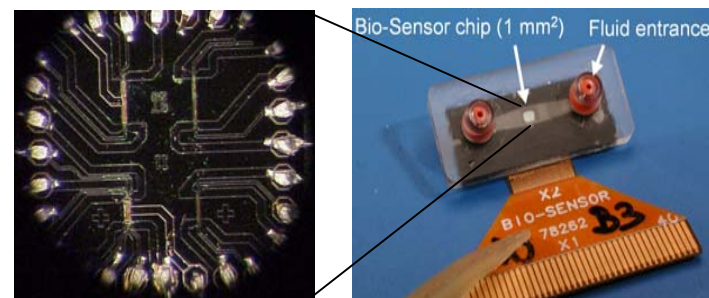
## OPTICAL DETECTION

- Low cost (DVD technology)
- Small size
- High sensitivity – single molecule detection!



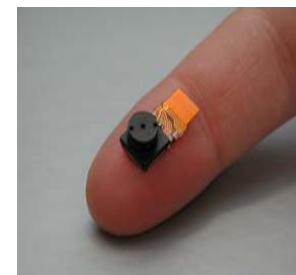
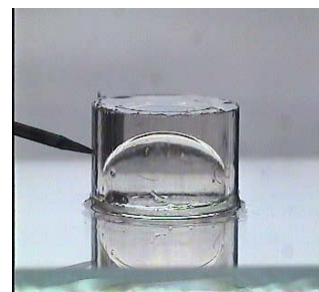
## MAGNETIC BIOSENSOR

- Low cost (magnetic read head technology)
- Integrated Biosensor with small size
- Rapid measurements possible



## MINIATURIZATION & INTEGRATION

- Electronics on glass or plastic
- Fluidics without moving mechanical parts
- Enables fully integrated cartridges: near patient testing





# Molecular Diagnostics

## Bringing the test to the patient



- Tie into existing Philips leadership positions
  - Patient monitoring – Infectious disease
  - Cardiovascular disease
  - Oncology



## Our Strengths in Molecular Imaging

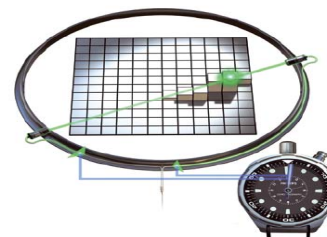
### SCHERING ALLIANCE

- Optical Mammography project
- Framework for additional programs
- Leverages the strengths of both entities



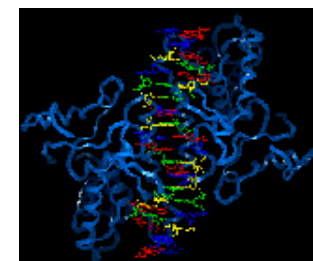
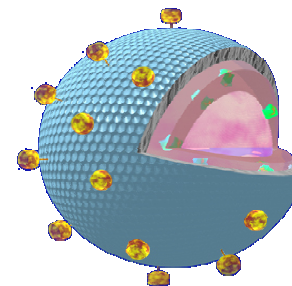
### GEMINI TIME OF FLIGHT PET

- Increased throughput
- Increased sensitivity
- Pipeline improvements



### CONTRAST AGENT DEVELOPMENT

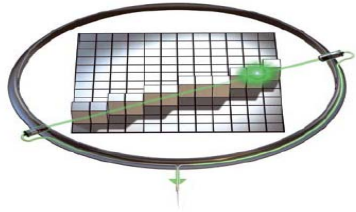
- Molecular targeted micro bubbles for U/S
- Targeted SPECT & PET Agents
- Molecular targeted Magnetic particle imaging



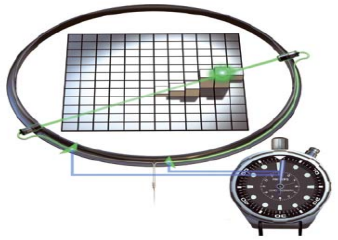
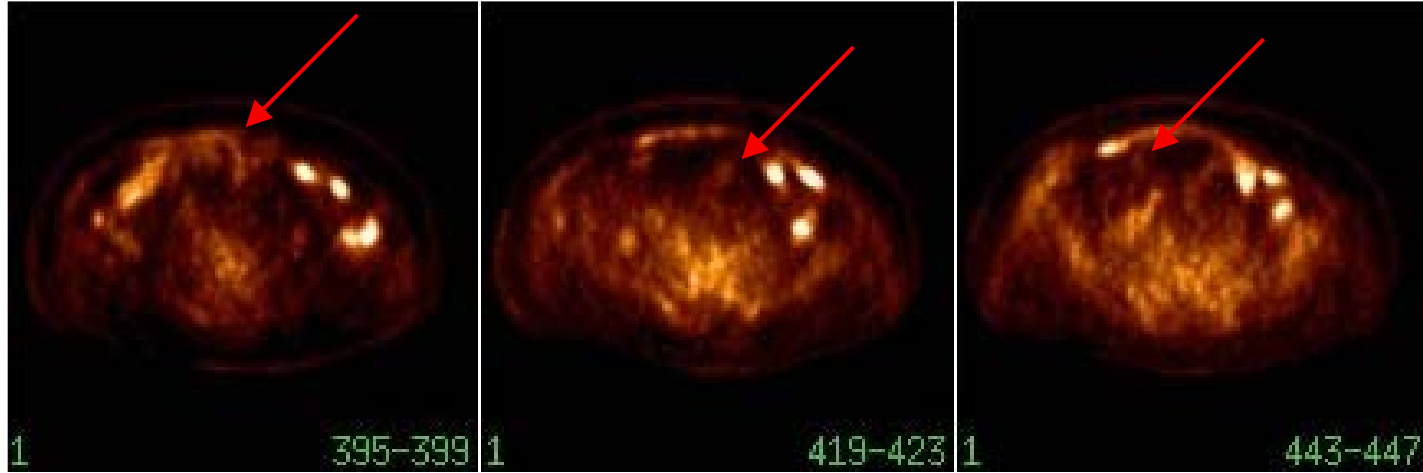


For years,  
time-of-flight PET imaging has tantalized  
and eluded research teams

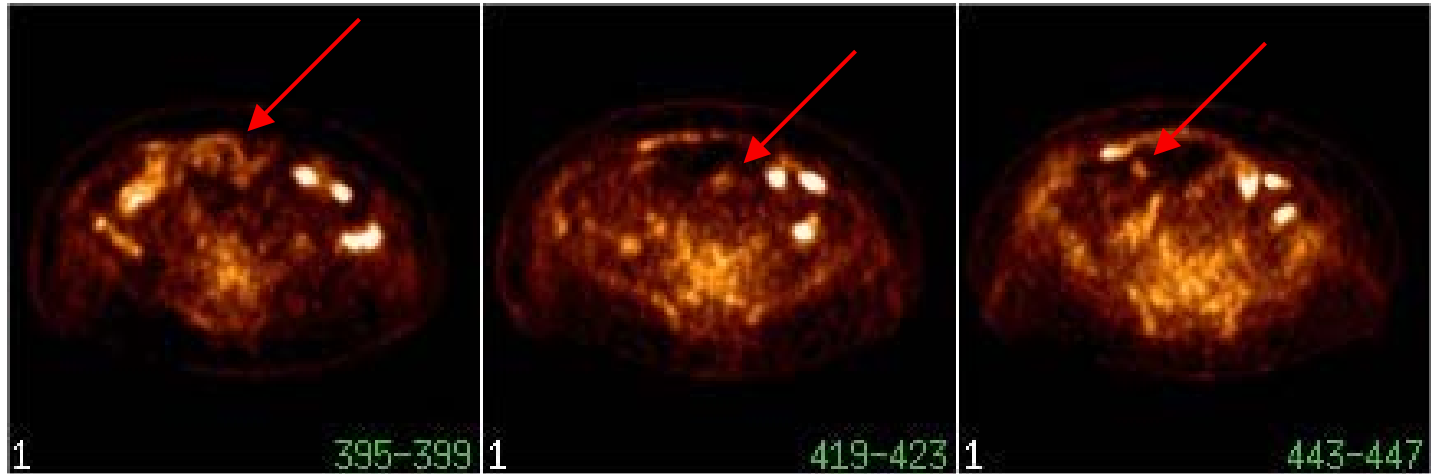
# Gemini TF – Time of Flight Technology



Coincidence and Back-projection



Timing within coincidence window



Data courtesy of J. Karp, University of Pennsylvania

# VISION: PET CENTER OF THE FUTURE

PET/CT and SPECT CT

as central diagnostic tool to guide the care cycle in oncology:

Diagnosis

Improved sensitivity  
Improved specificity  
metastasis

Staging

Aggressiveness  
Metabolic activity

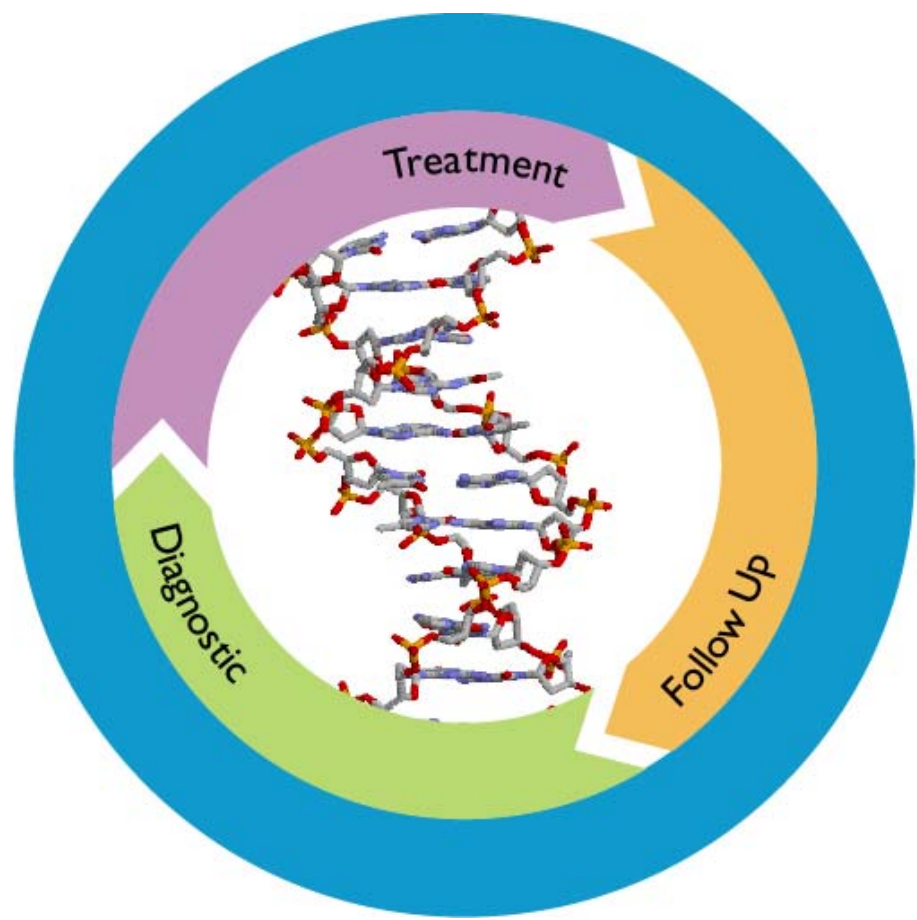
Therapy

Radio resistance  
Accurate Delineation  
Radio Immunotherapy

Follow-up

Apoptosis  
Proliferation  
Metabolism versus Inflammation

# Innovation – Completing the Care Cycle



## Molecular Diagnostics

From lab based tests to patient centric care in the community & the hospital

## Molecular Imaging

From diagnostic imaging to targeted molecular diagnostics and therapy

