CombiMatrix

Discover the possibilities

Current Status and Future Directions of Microfabricated Semiconductor Arrays

CombiMatrix Corporation
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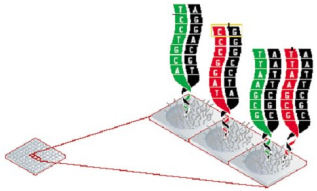
President & CEO

www.combimatrix.com

This presentation contains forward-looking statements within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. These statements are based upon our current expectations and speak only as of the date hereof. Our actual results may differ materially and adversely from those expressed in any forward-looking statements as a result of various factors and uncertainties, including the recent economic slowdown affecting technology companies, our ability to successfully develop products, rapid technological change in our markets, changes in demand for our future products, legislative, regulatory and competitive developments and general economic conditions. Acacia Research: CombiMatrix Annual Report on Form 10-K, recent and forthcoming Quarterly Reports on Form 10-Q, recent Current Reports on Forms 8-K and 8-K/A, and other SEC filings discuss some of the important risk factors that may affect our business, results of operations and financial condition. We undertake no obligation to revise or update publicly any forward-looking statements for any reason.

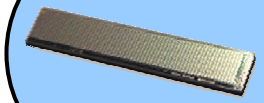
Multiple, High Growth Markets

MICROARRAYS & DIAGNOSTICS



DRUGS

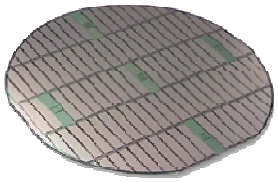
CBMX



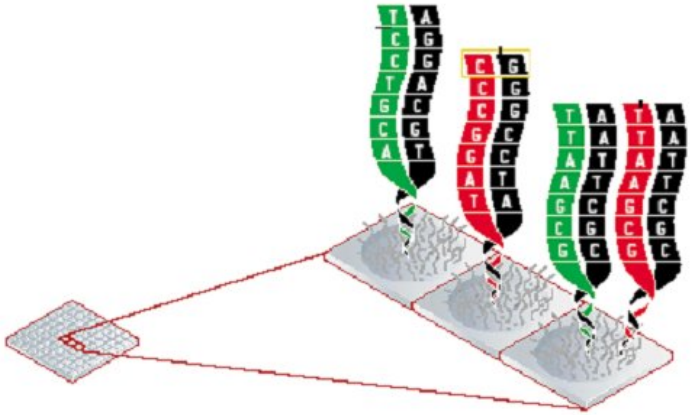
Array

HOMELAND SECURITY

NANOTECHNOLOGY



DNA Microarrays



Any Genome (1100 sequenced)

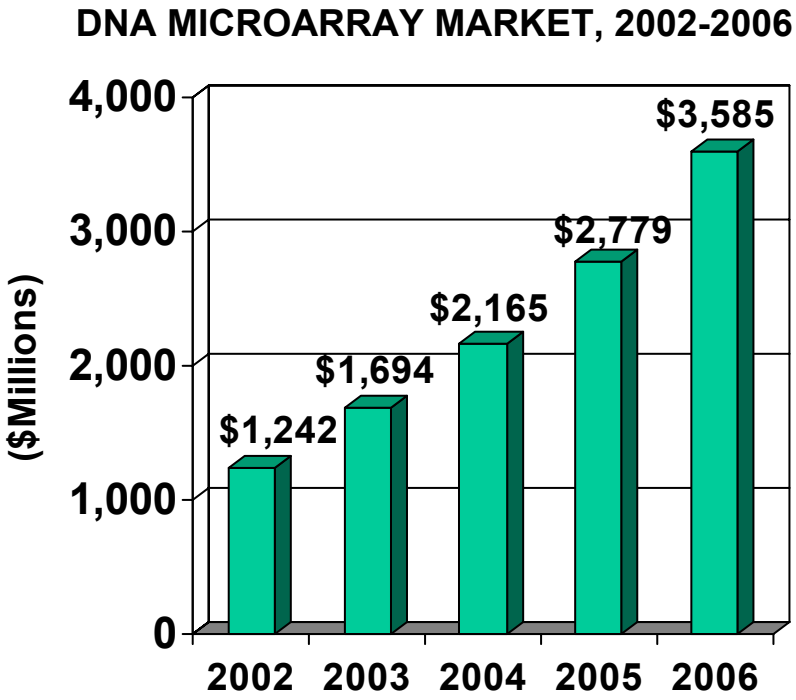
Multiple Genomes on One Array

Any Gene

Any Probe/Sequence

Any Oligo Length

Multiple Oligo Lengths on One Array

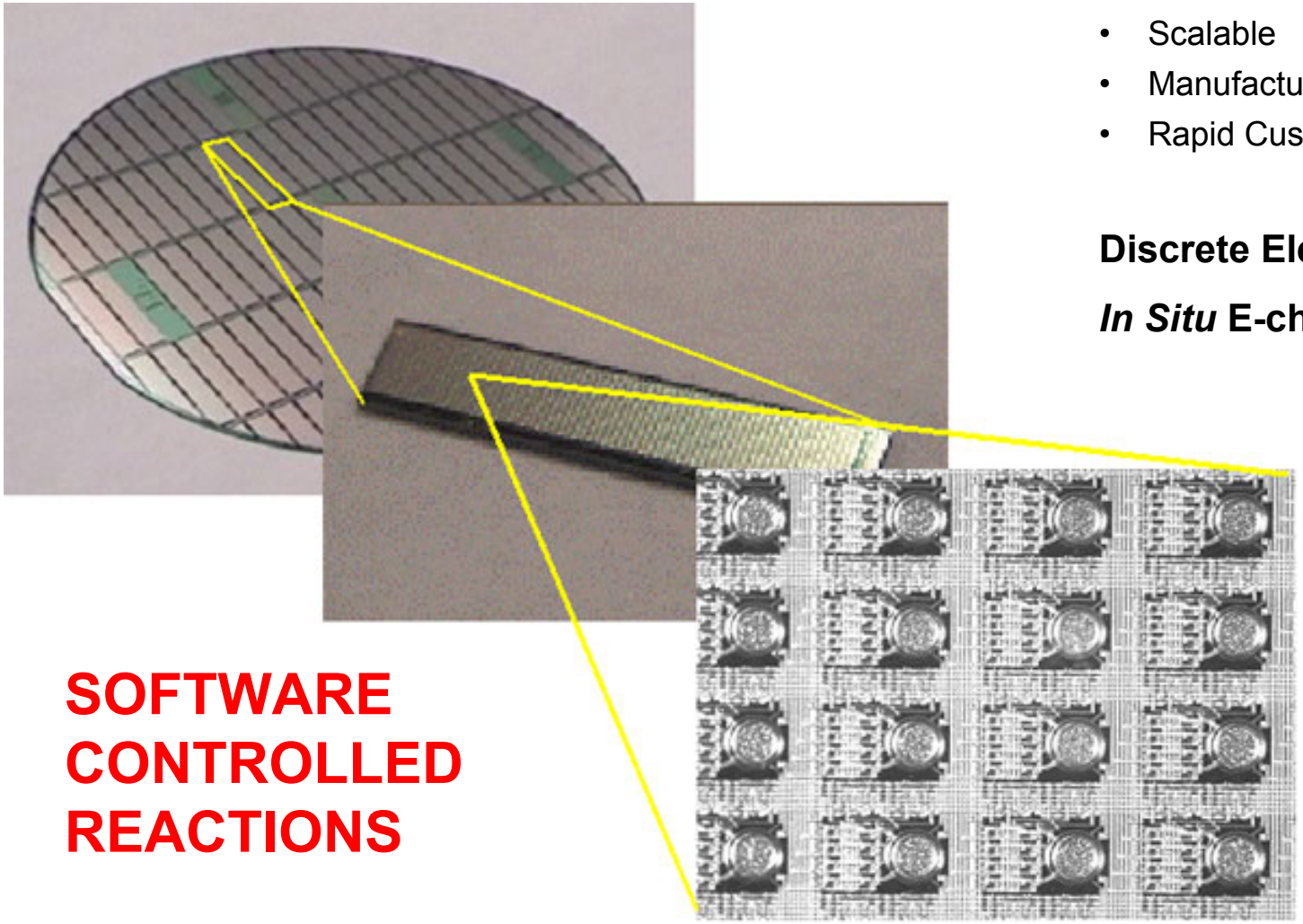


- Market Growth of 32% (CAGR)
- High Demand for Customized Arrays
- New Opportunities in Genetic Testing

*Note: 2001 Frontline Research for Overall DNA Microarray Market Size and Growth

Fabricating DNA Microarrays through Nanotechnology

Virtual Flask Technology



Active Semiconductor

- Scalable
- Manufacturing Costs
- Rapid Customization

Discrete Electrodes

***In Situ* E-chem Synthesis**

SOFTWARE CONTROLLED REACTIONS

1000 /cm^2

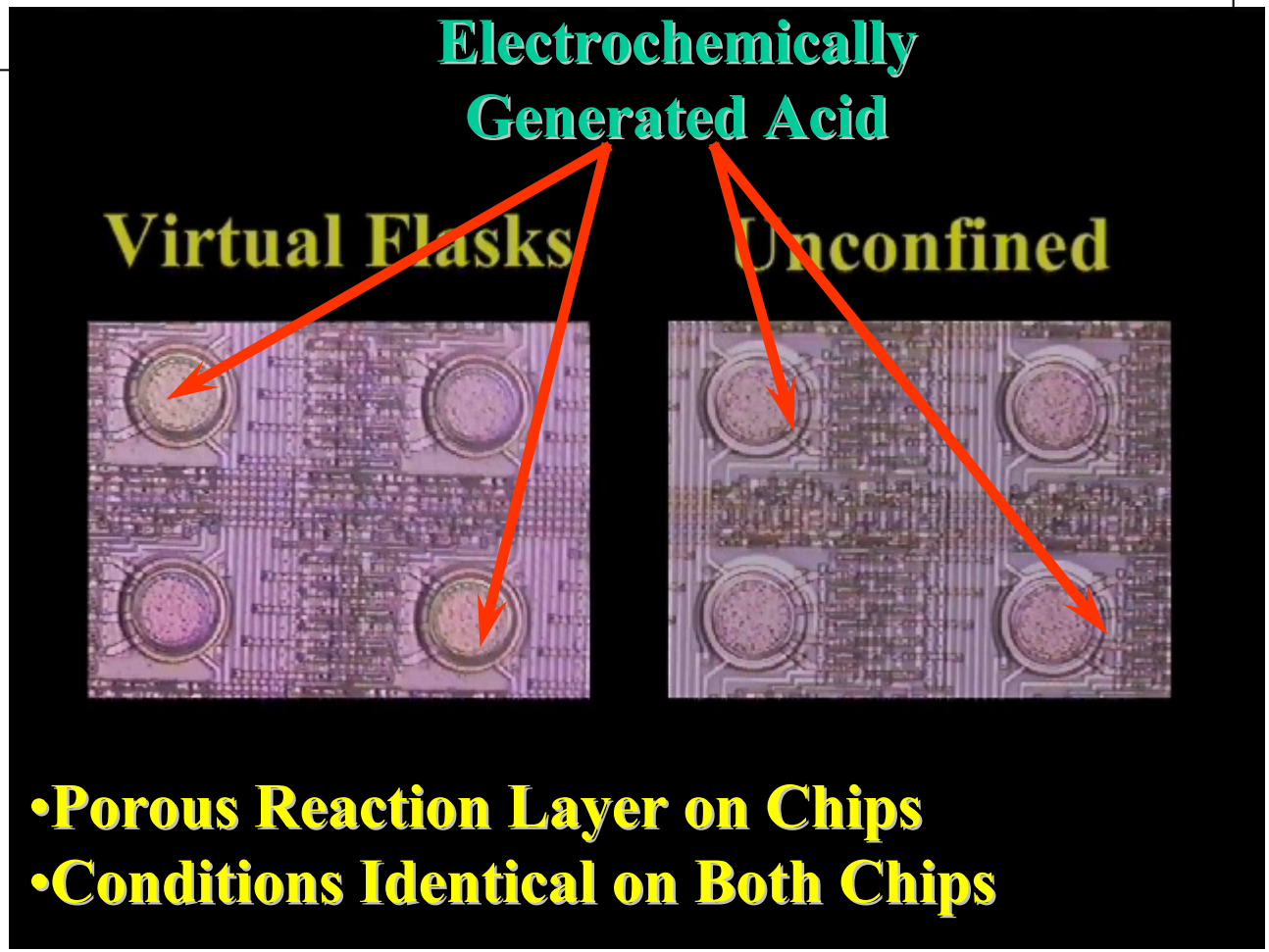
12,000 /cm^2

1.8 MM /cm^2

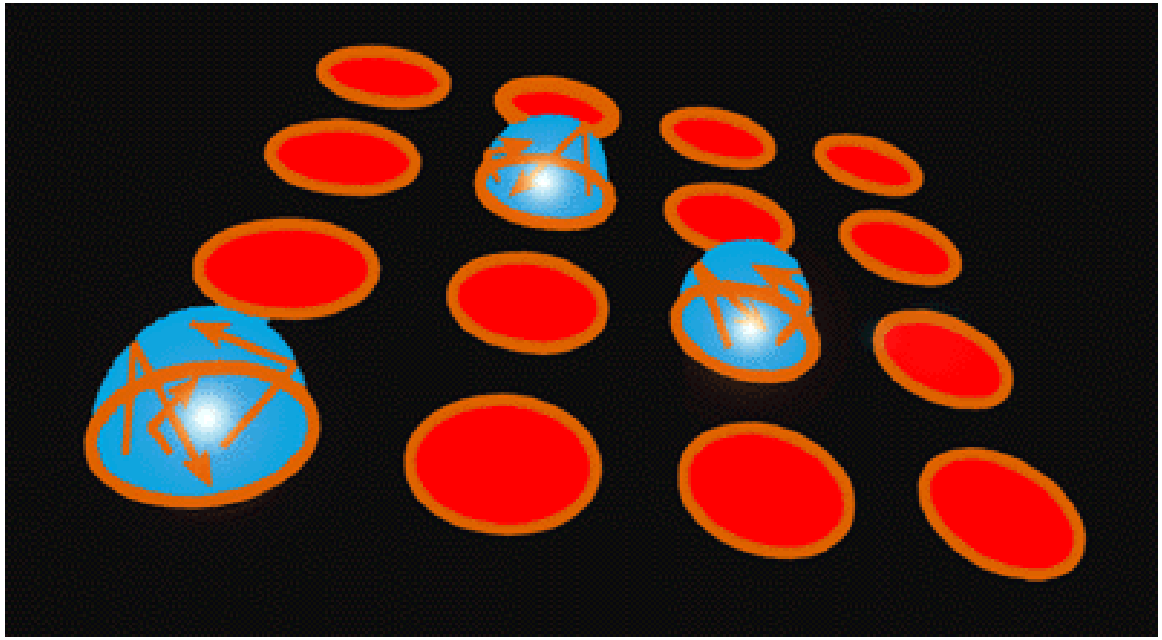
Virtual Flask Technology

Dye = Acid pH

Dye = Neutral pH



‘Virtual Flask’ Technology



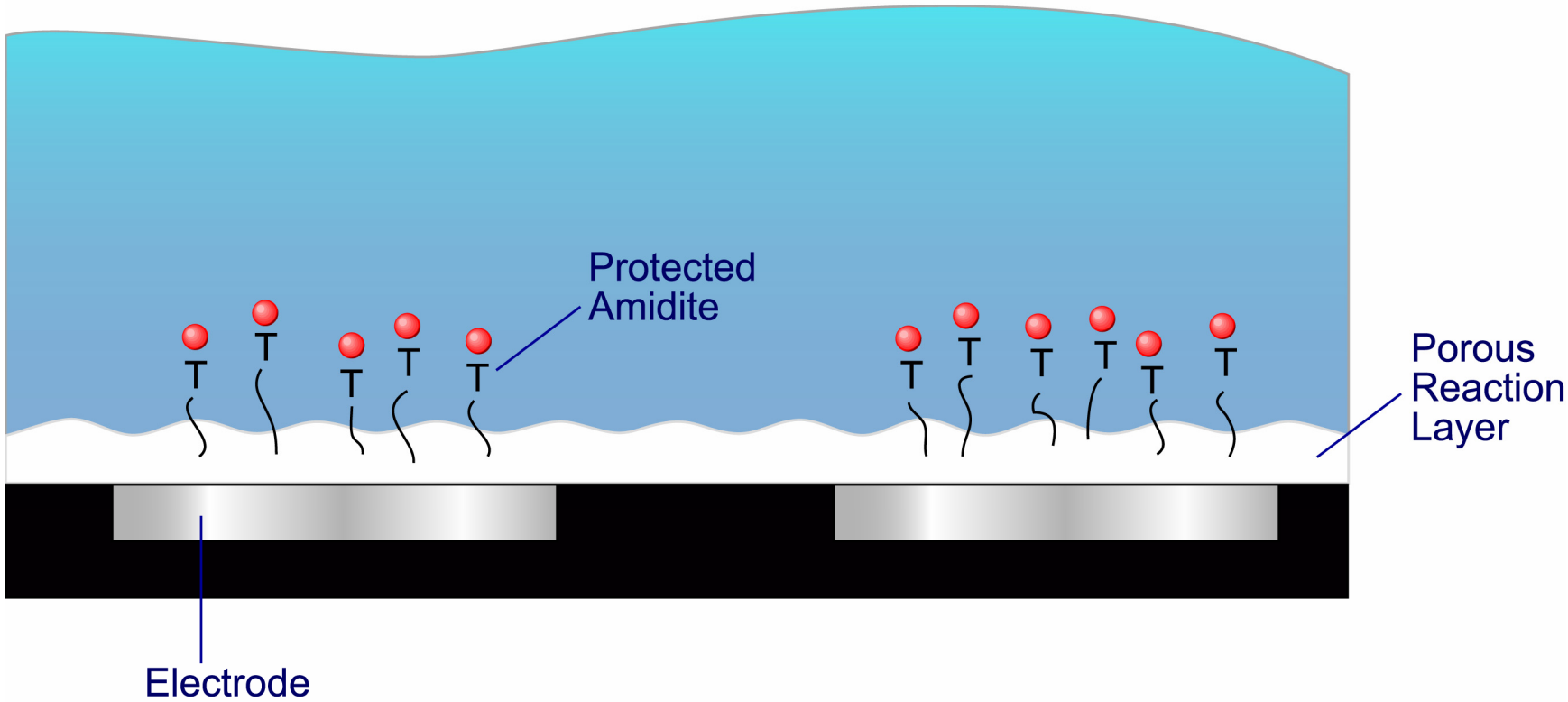
- **Reagents are generated only at the “ON” electrodes only**
- **Special reaction conditions confine the reagents over the electrodes**
- **Volume of each “Virtual Flask”reactor is 0.4 nanoliters**

Nanotechnology

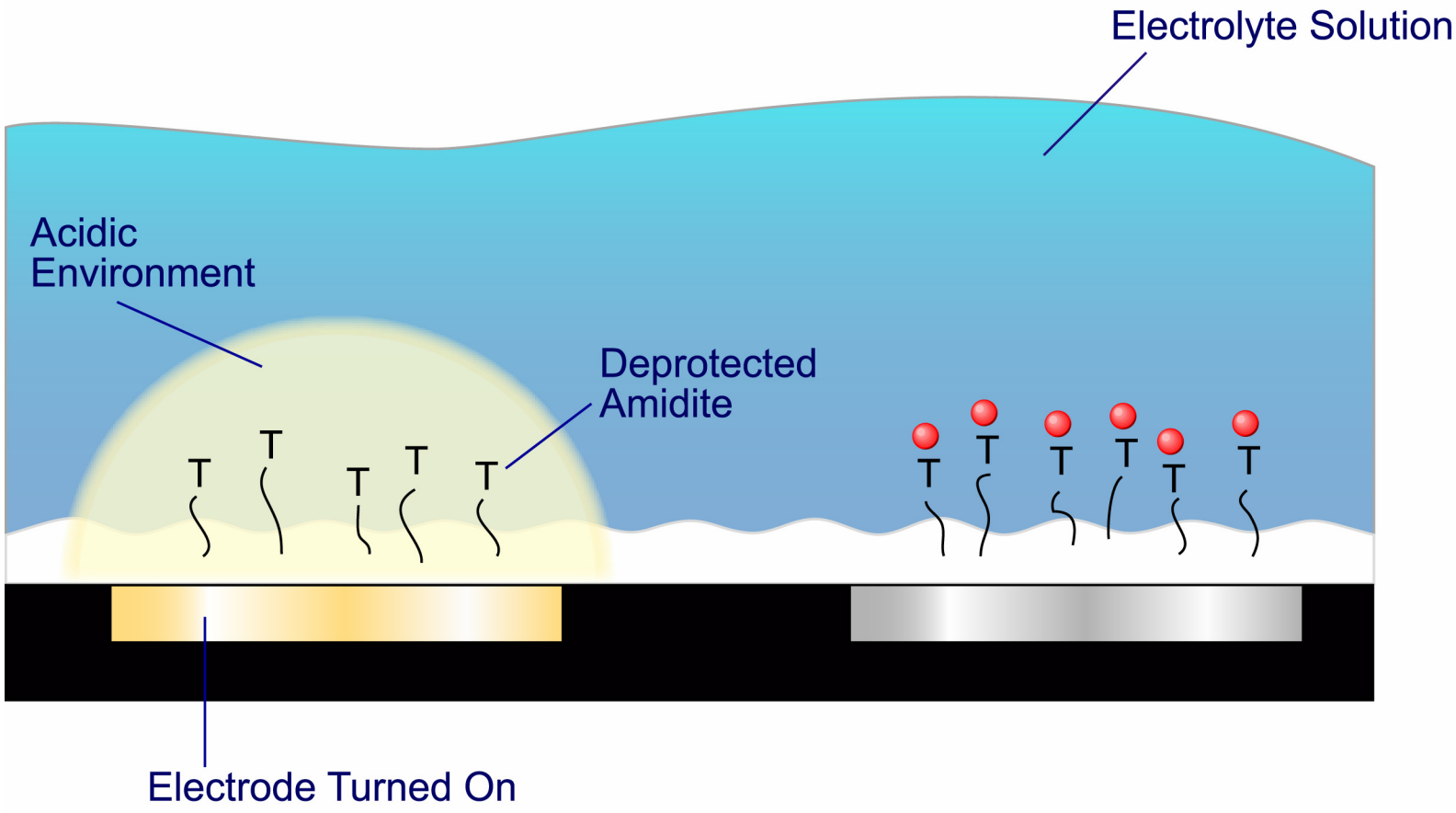
- **TOP DOWN APPROACH**
  - **We build semiconductor devices with features going from microns to nanometers**
  - **Feature densities include**
    - **1000 sites per cm^2**
    - **12,000 sites per cm^2**
    - **1.8 million sites per cm^2**
    - **Working in 1 Billion Sites per cm^2**

- **BOTTOM UP APPROACH**
  - **We assemble, in parallel, thousands of different DNA molecules one base at a time, in reactors with volumes of tenths of nanometers**

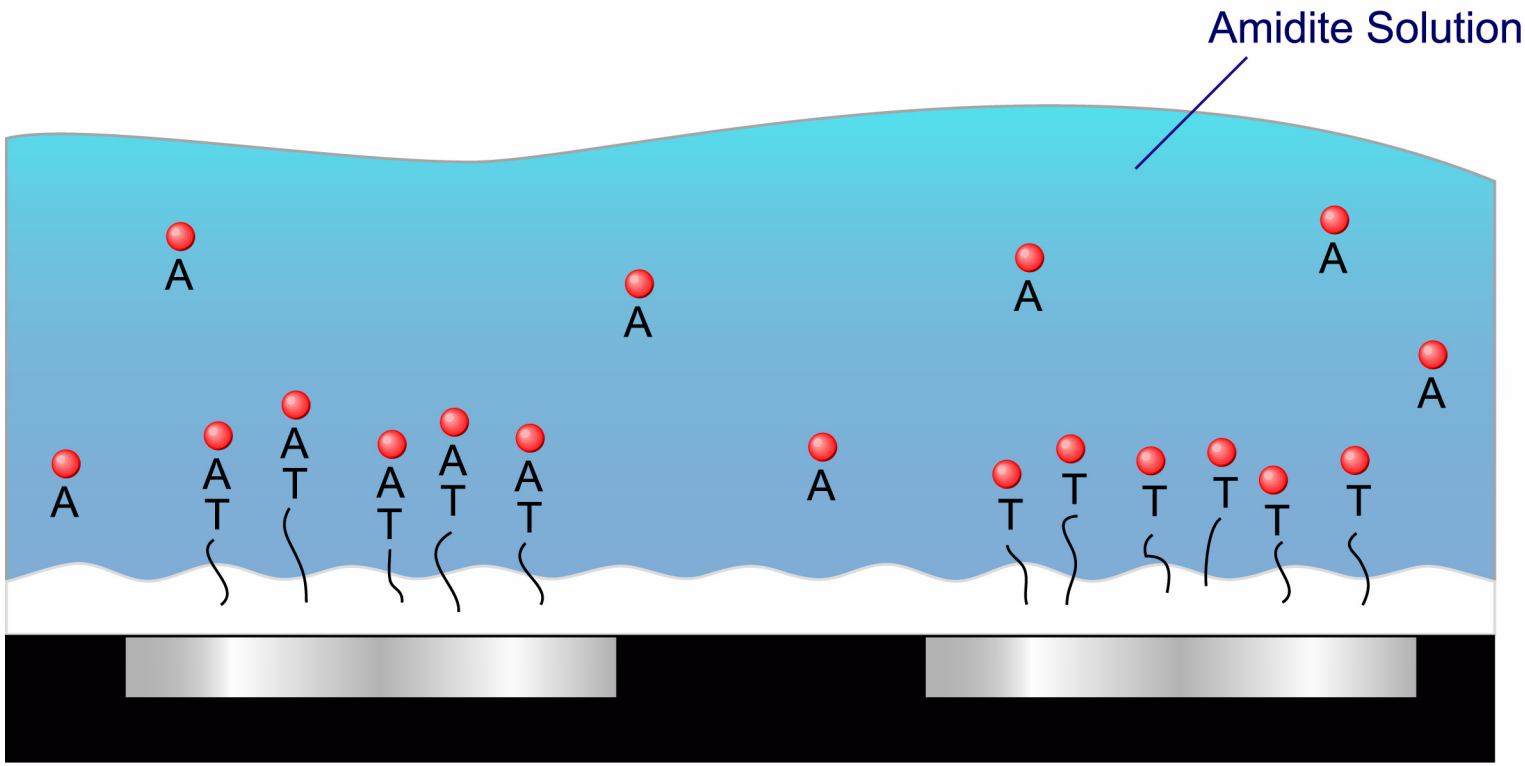
START



DEPROTECT


Electrolyte Solution
Acidic Environment
Deprotected Amidite
T
Electrode Turned On

COUPLE



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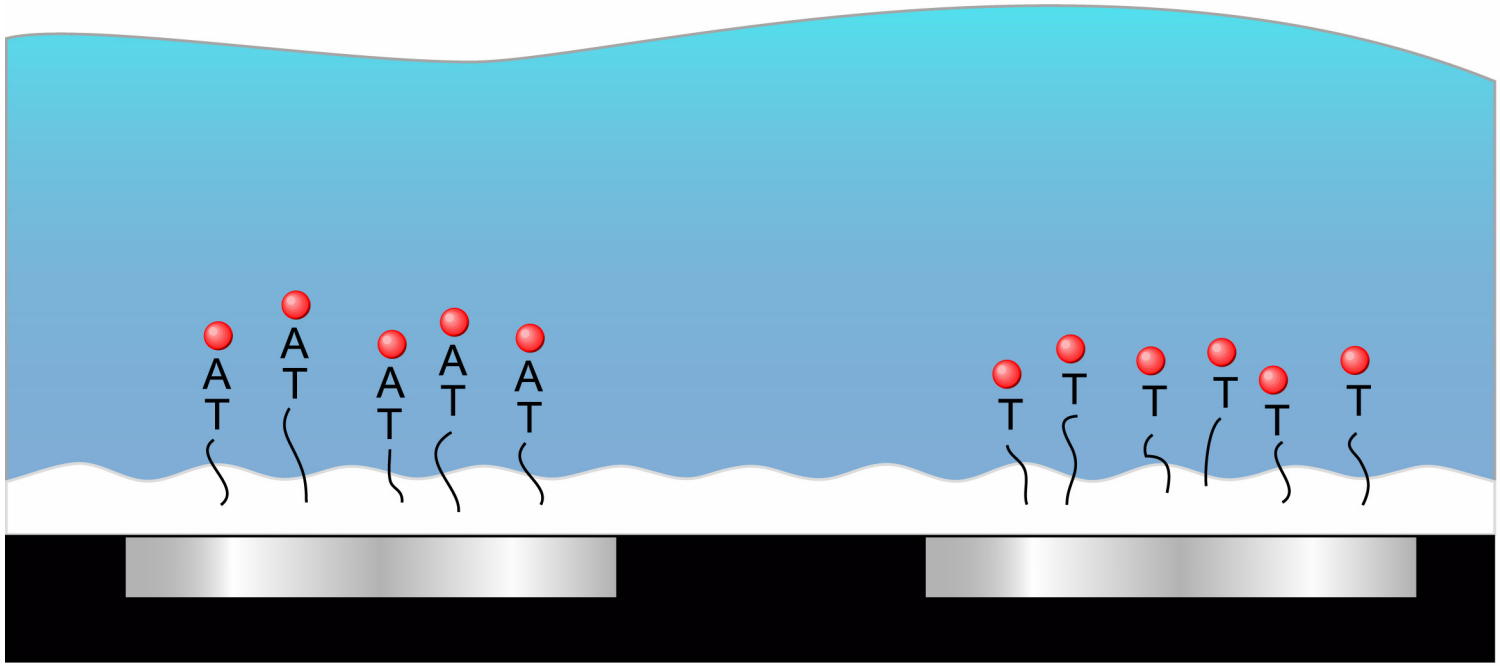

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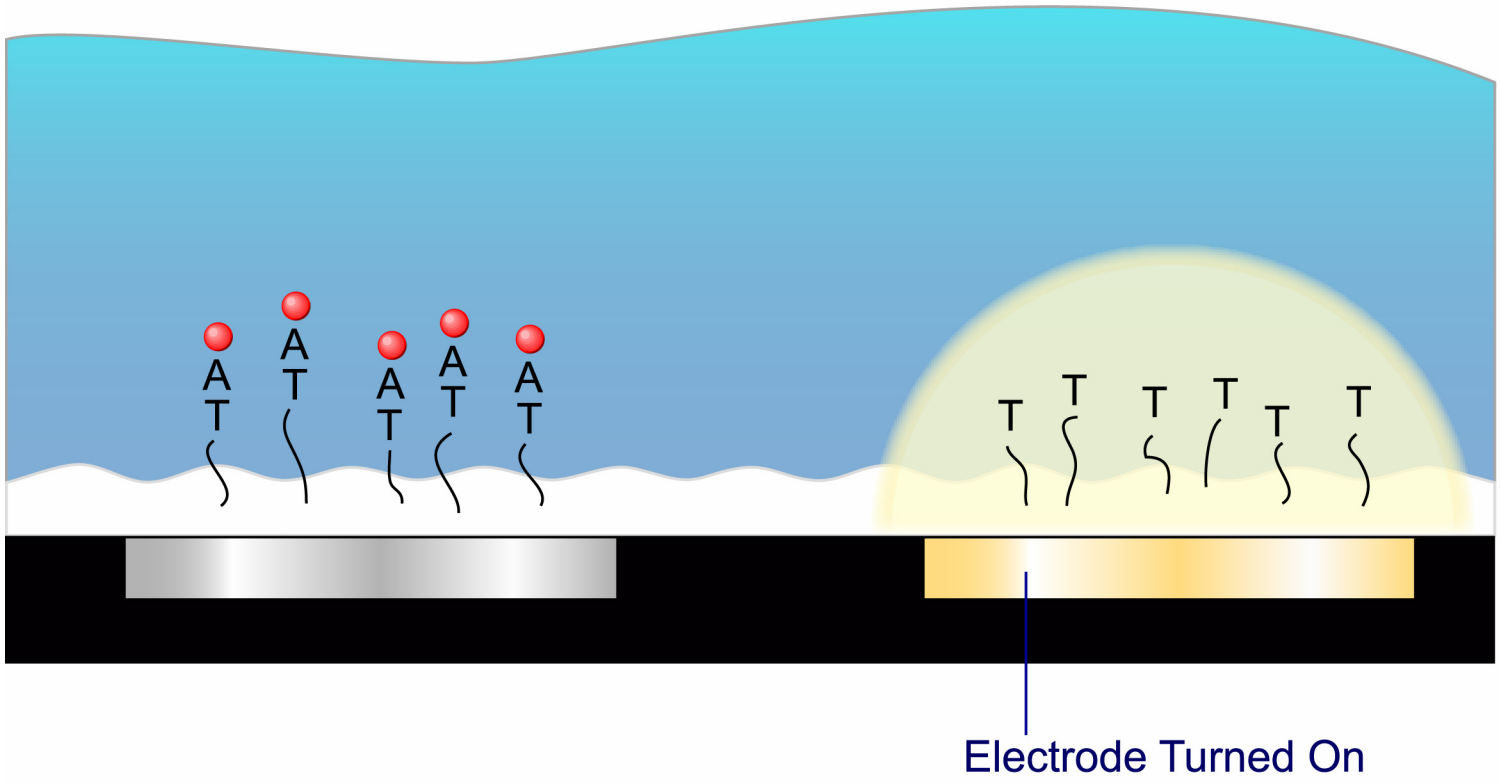

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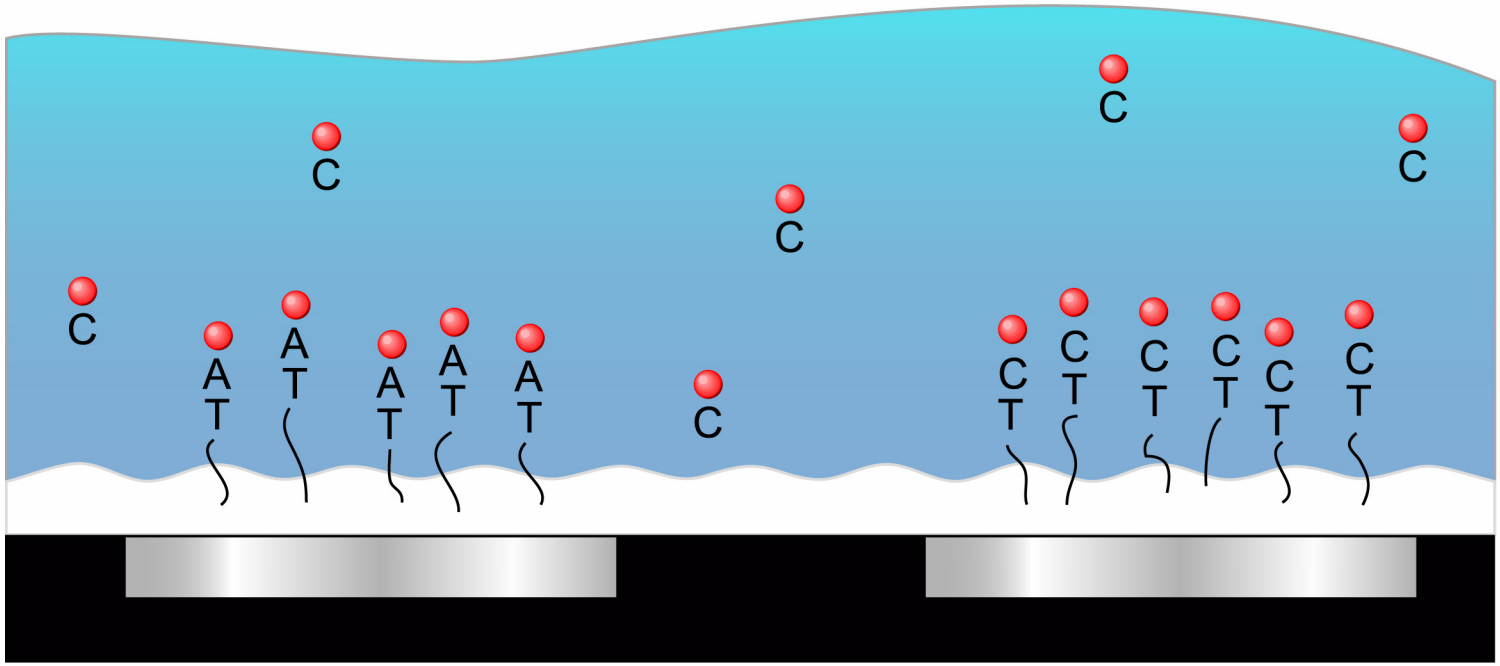

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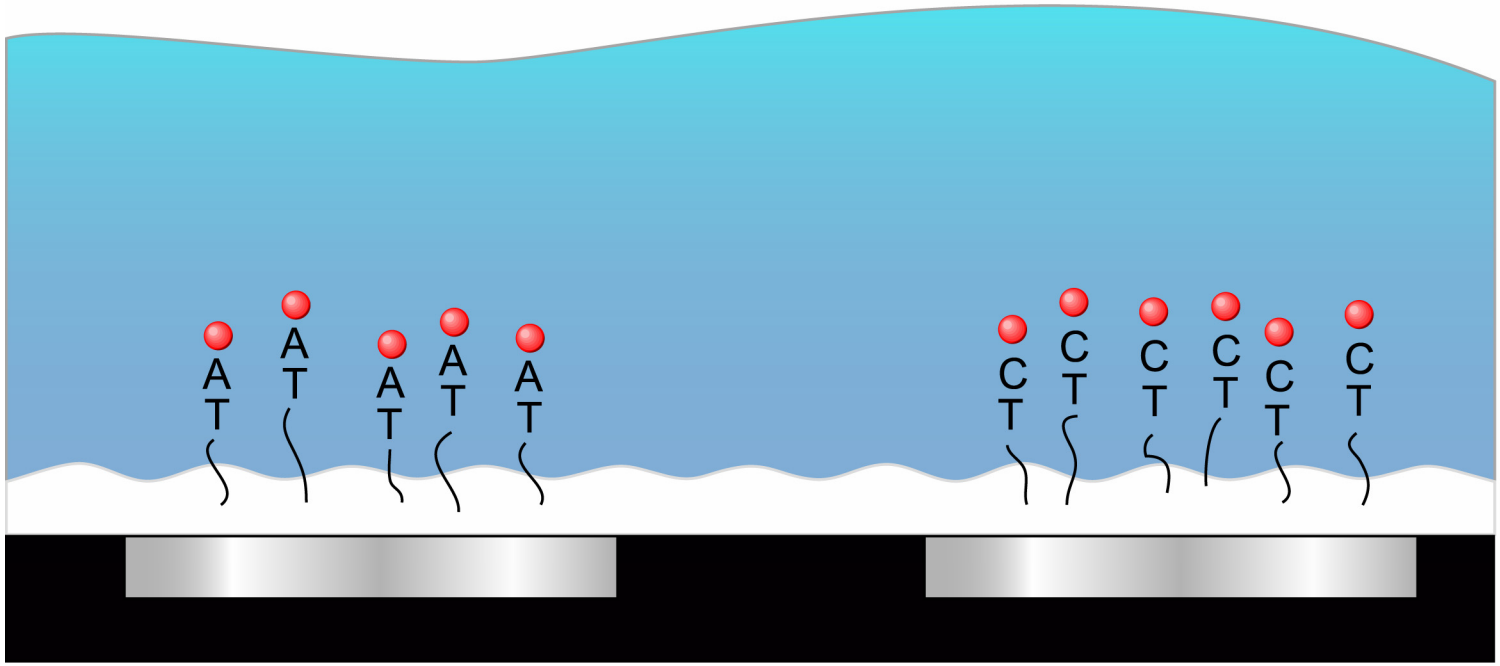

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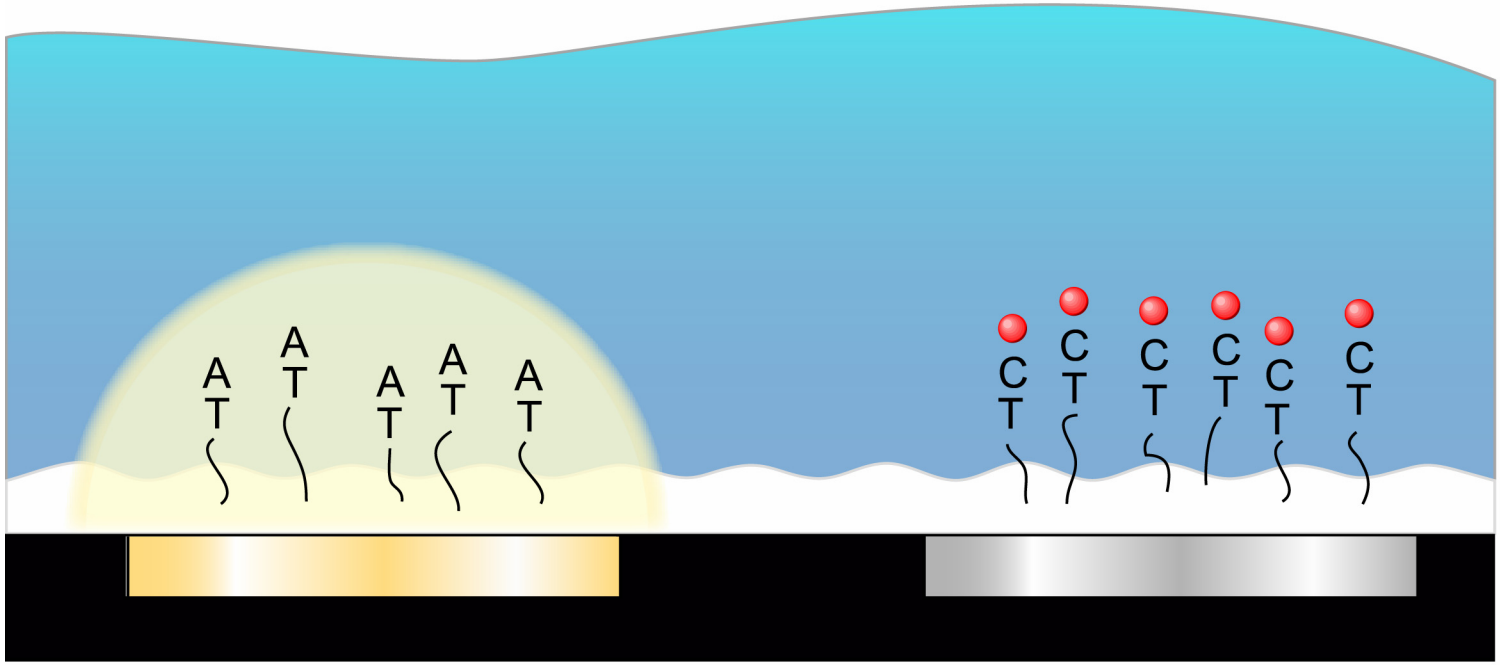

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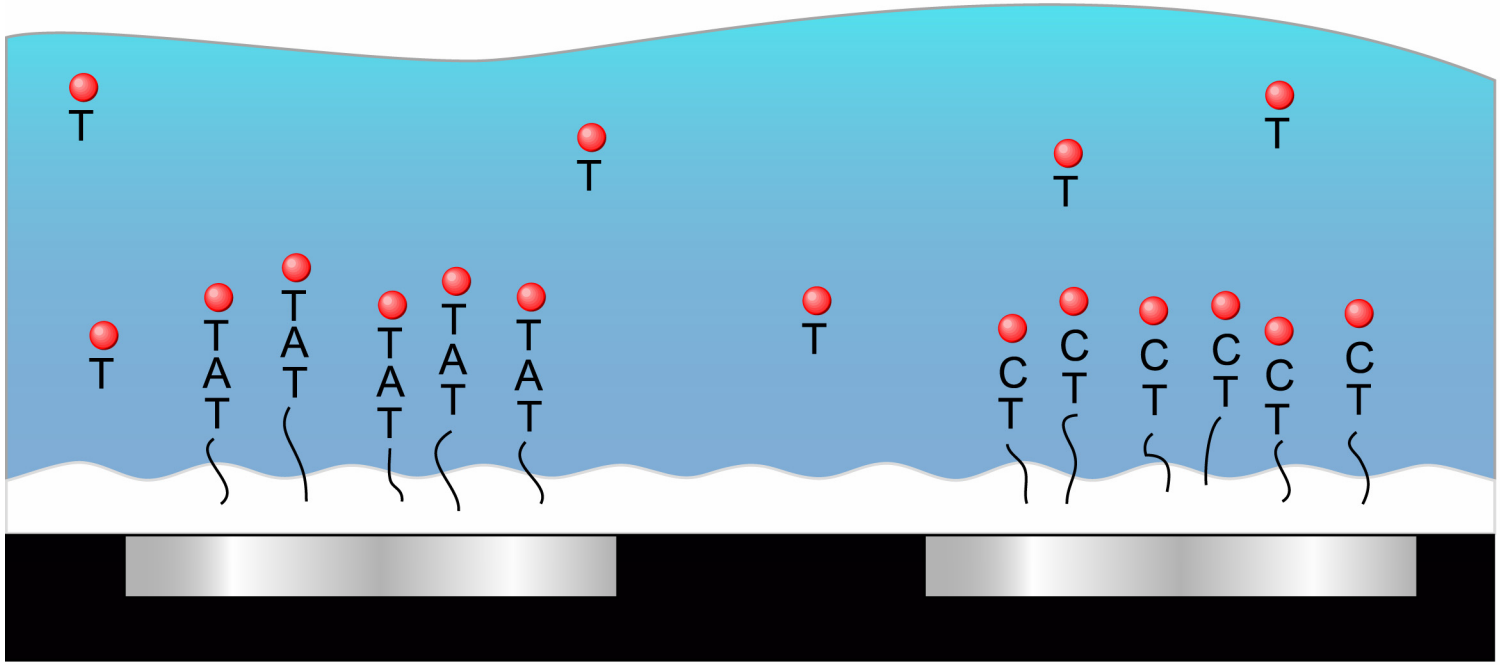

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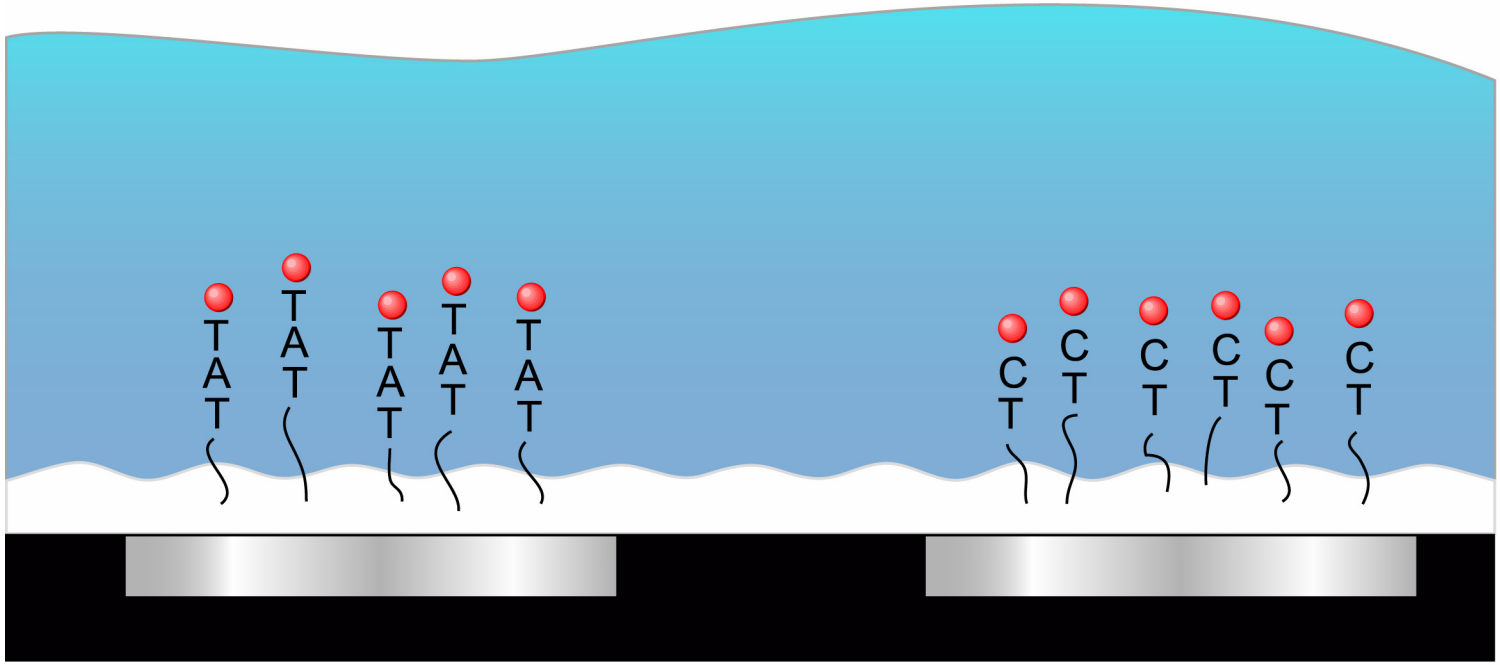

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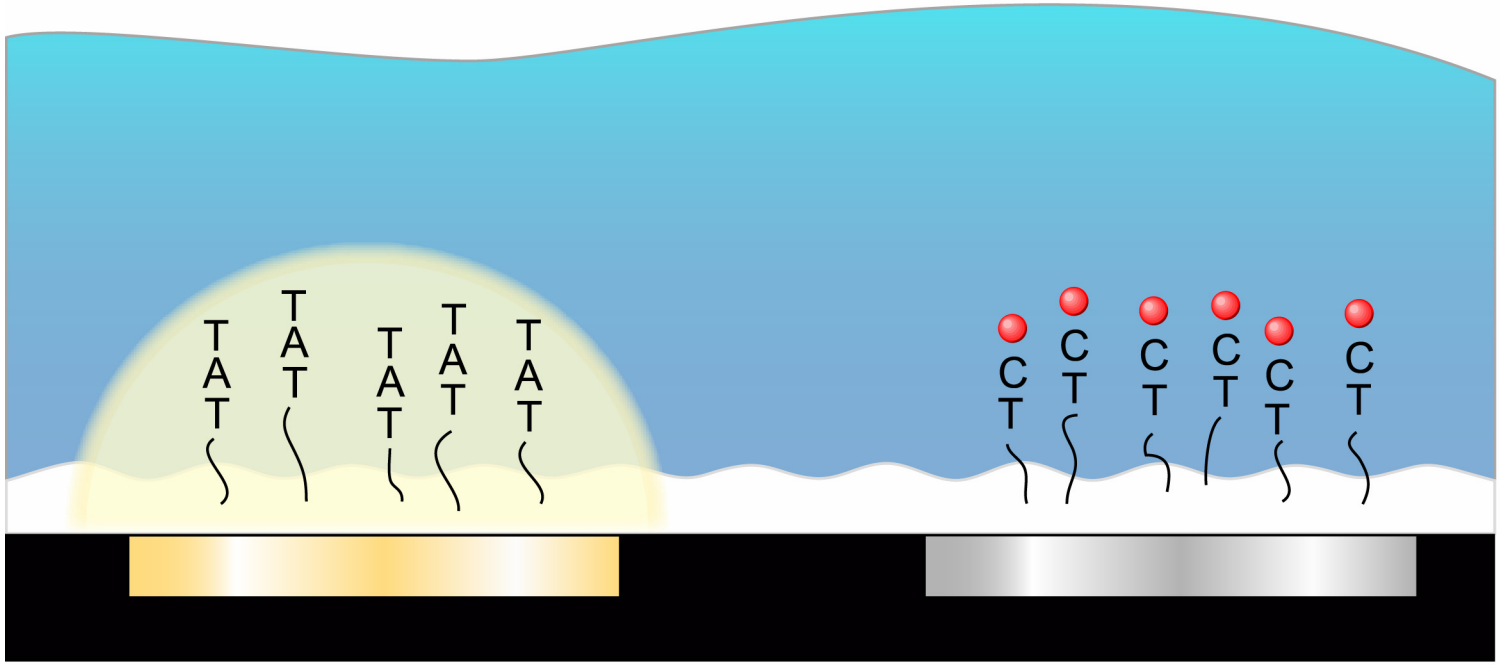

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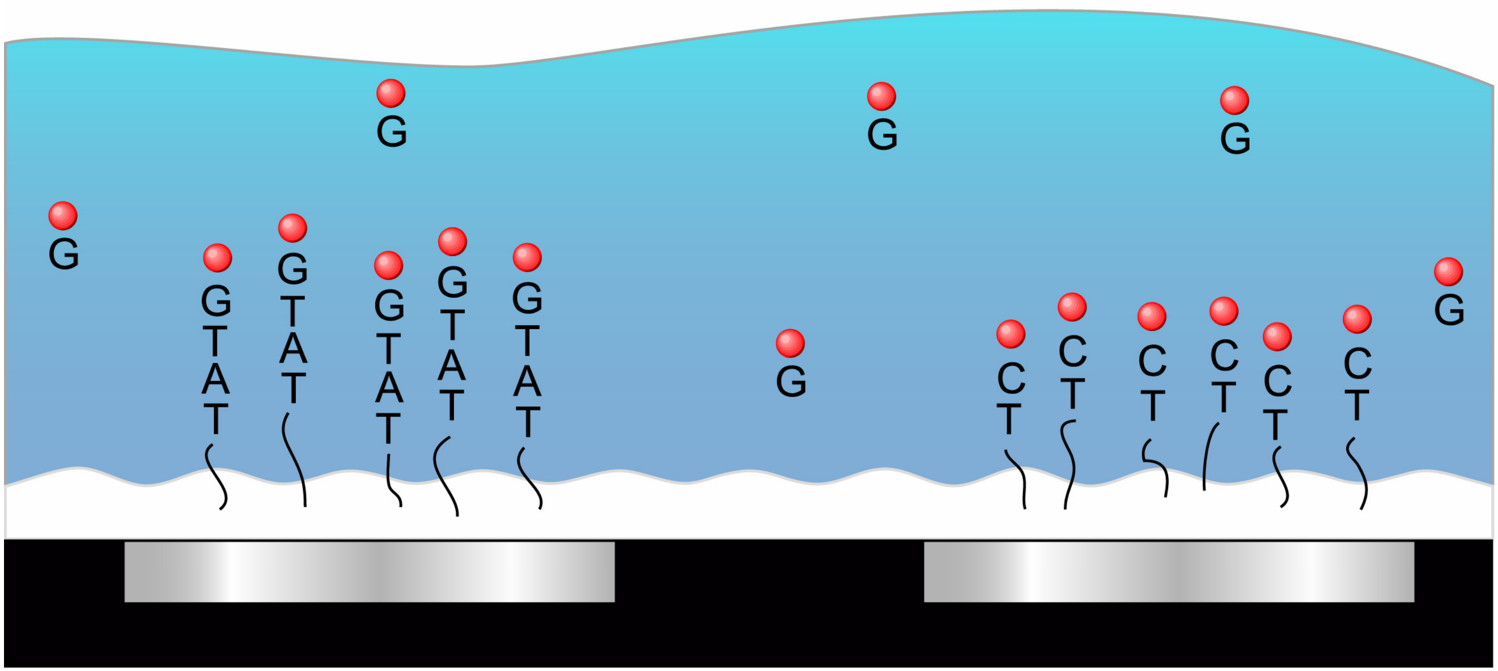

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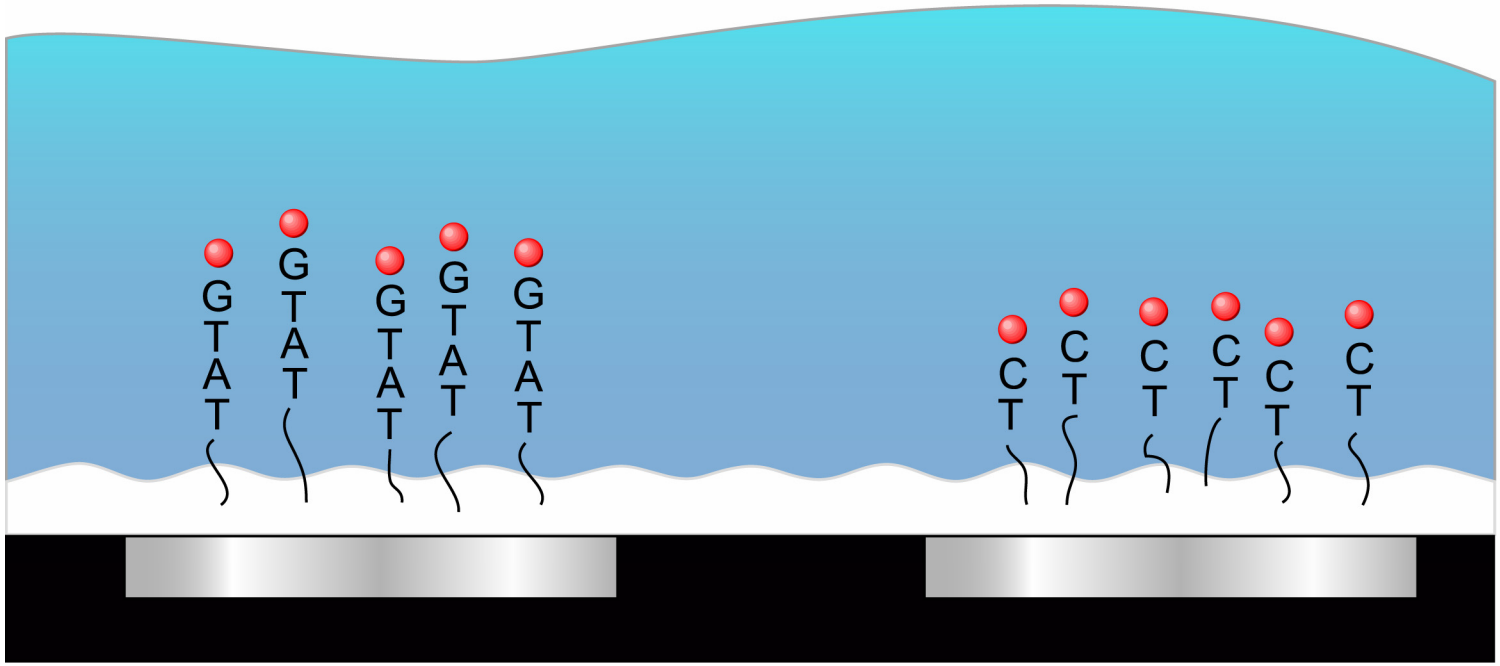
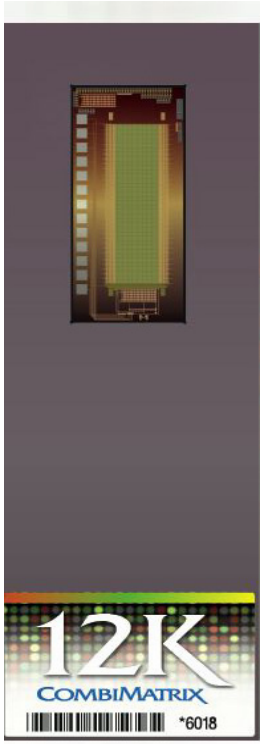


MicroArray Formats: Macro-Nano Interface

MatrixArray™



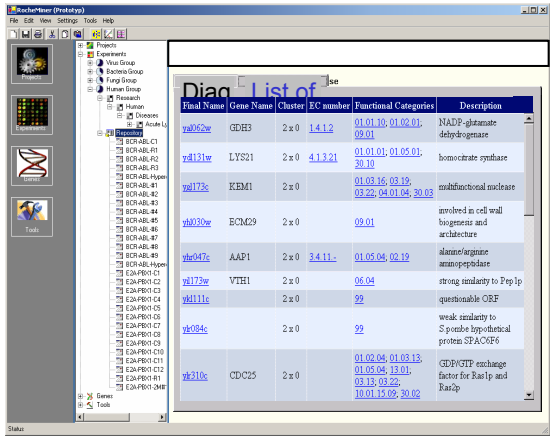
CustomArray™

MatrixArray™ Suite

Arrays

Hybridizer-Reader

Reagents



Software

Roche - MatrixArray™

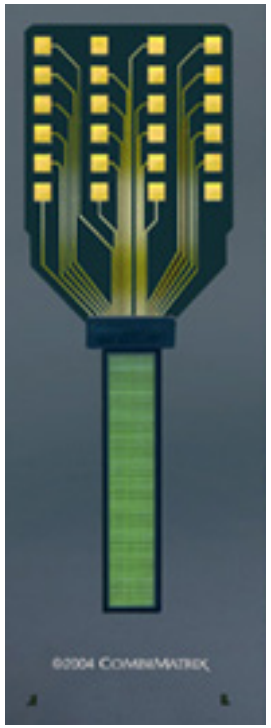
- 15 year, Non-Exclusive
- $$$ Payments- Received > 26 MM so far
- Roche Manufactures
- Roche
  - Markets
  - Sells
  - Distributes
  - Services
- Multiple Royalty Streams

Roche

matrixarray

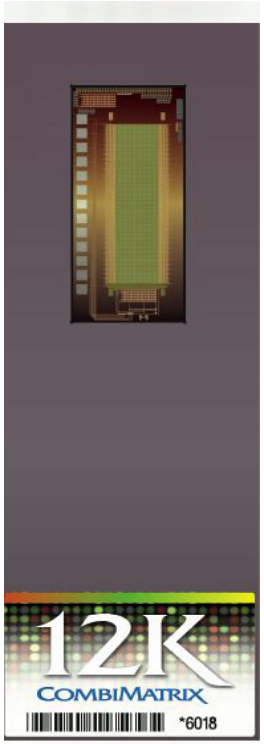
REAL WORLD VALIDATION

CustomArray™ Product Formats



CustomArray™902

Commercial Launch – March 2004



CustomArray™12K

Commercial Launch – July 2004

Catalog Arrays

- Human Metabolism Array- Launched/July
- Human Toxicology Array- Launched/July
- **Oncology- 67 Common Genes- This Morning**
  - Lung
  - Breast
  - Colon
- CNS- Central Nervous System- Q4
- Cardiovascular-Q4
- Metabolic Diseases-Q4-'04/Q1-05
- Other Catalog Arrays

- **Future-'05- Whole Genome Catalog/customizable Array**

- **Probes Specific To Application**
- **Updated as New Data Available**
- **Customized with additional customer requests**

siRNA Drugs

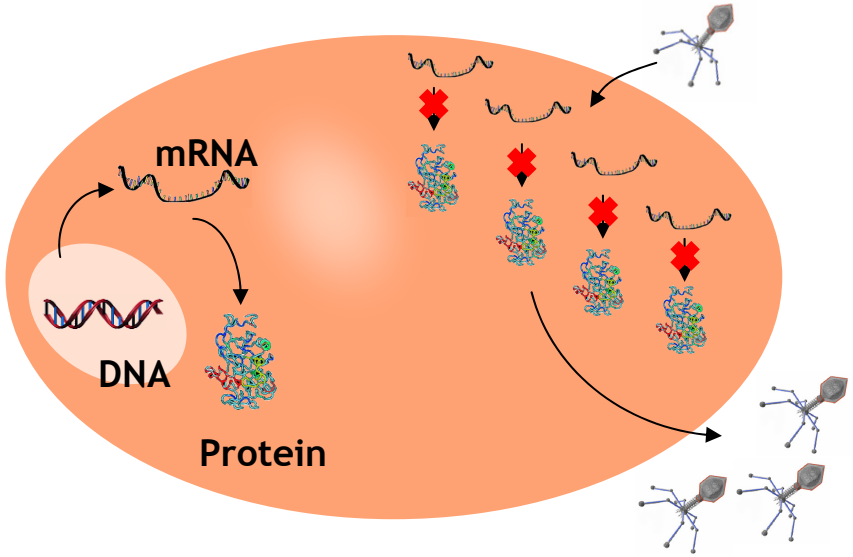
siRNA Drugs

- Landmark Technology - As Revolutionary as Genetic Engineering and MonoClonal Antibodies
- Small Nucleic Acids – Shut Down Production of Proteins Responsible for Disease
- Endogeneous Mechanism
- Very Powerful

siRNA Drug Discovery Program

- Target multiple genes
- "Cocktail" Approach

SARS Coronavirus
HIV type 1 (HIV1)
HIV type 2 (HIV2)
West Nile virus
Human Papillomavirus type 16 (HPV)
Human Herpes 8 (Kaposi's sarcoma)
Smallpox (Variola)
Influenza virus A
Influenza virus B
Hepatitis C



Early Studies With Academic Collaborators

Further Development With Large Partners

HIV Program

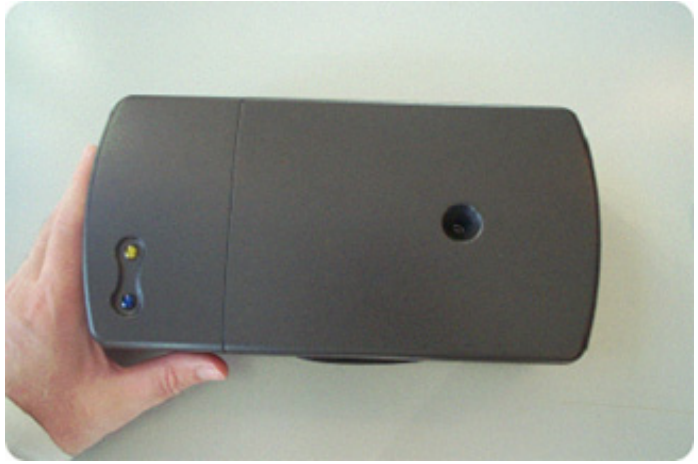
- PRE-CLINICAL RESULTS
  - Identified Two Sequences
    - Reverse Transcriptase
    - Nef
  - In Vitro Studies
    - Transformed Cell Line
    - 99% Knockdown
  - Most Powerful Effect Seen To Date
- DEVELOPMENT PLAN
  - Delivery Vectors
  - Mouse Models
  - Development Partnership
  - Primates
  - Humans

Collaborator: Dr. Bonaventura Clottet, at irsiCaixa-leading HIV Clinic and Research Laboratory in Western Europe

Defense Applications

Electrochemical Detection

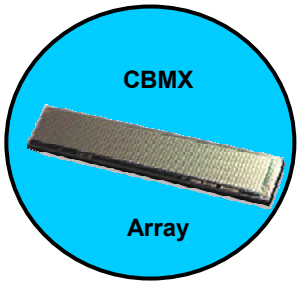
Homeland Security
Bio/Chemical Warfare Agent Detectors



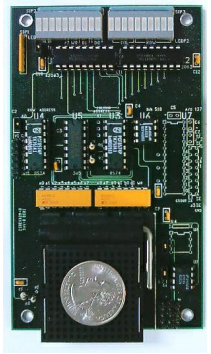
- Funded by US DOD pre-9/11
- 2002, prototypes to Military

- $5.9 MILLION DOD CONTRACT- March 2004
  - USAMRIID CRDA
  - AGENTS
    - Anthrax
    - Plague
    - Others
- TOPPAN (> $2 Million to date)
- Defense Contractor Discussions

Commercialization Vision

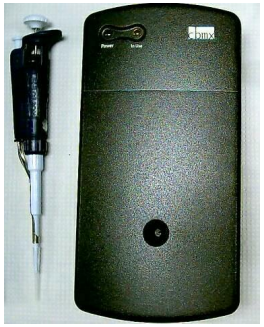


Detector Module



End-User

Product Formats



Portable

In Field

Laboratory

Automated

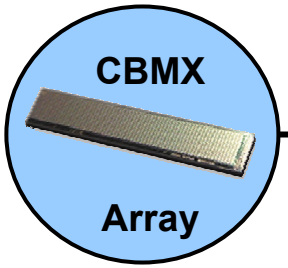
Continuous Monitoring

NANOTECHNOLOGY

Nanotechnology

- Non-Biological Applications of Technology
- Multiple Synergistic Relationships
- Partner Invests in Product Development
- Areas of Interest (Publicly Announced)
  - Nano-structured Materials
  - Chemical Libraries
  - Electronic Nose Sensors

Nanotechnology Partnerships

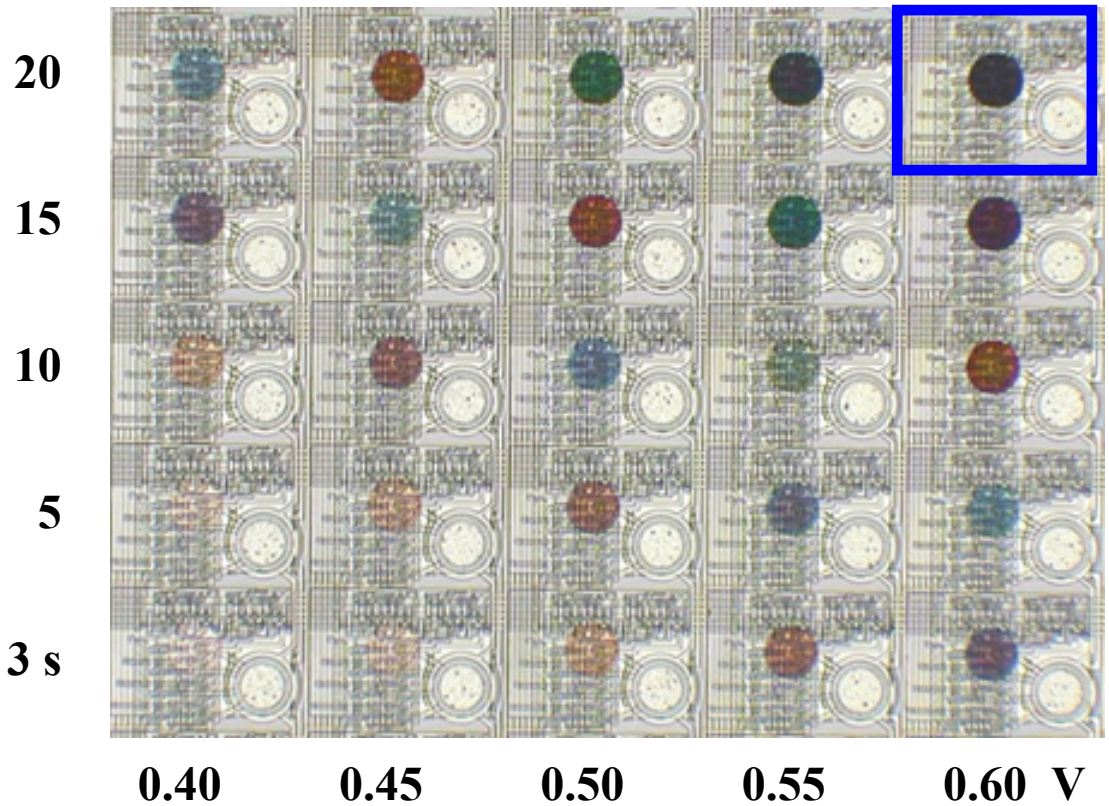


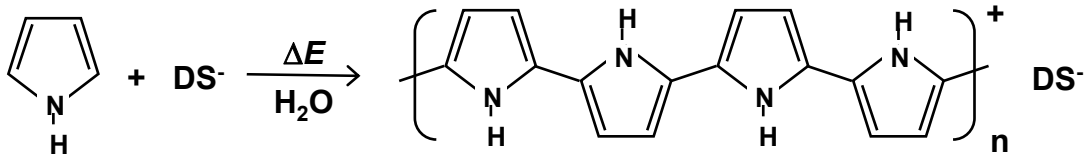
Electronic Nose → CYRANO sciences

Chemical Libraries → Washington University in St. Louis; National Science Foundation (WHERE DISCOVERIES BEGIN)

Nano-materials Discovery → NDC nanomaterials discovery corp

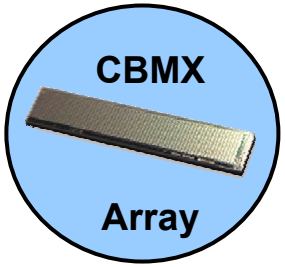
Polypyrrole Nanostructures





50 mM pyrrole and 1% SDS in H_2O

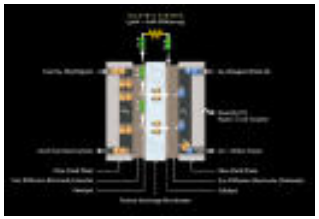
Nanotechnology Product Vision



NDC
nanomaterials discovery corp

- Synergy
- Capabilities
- Intellectual Property

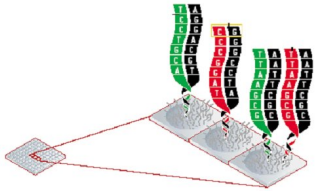
New Materials



Nanotechnology Workstation

Multiple, High Growth Markets

MICROARRAYS & DIAGNOSTICS



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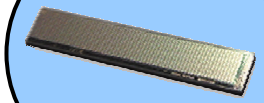

Array

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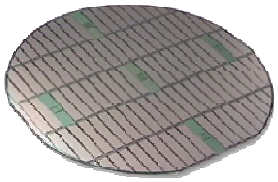
NANOTECHNOLOGY