A Nanoscale Artificial Nose to Easily Detect Volatile Biomarkers at Early Stages of Lung Cancer and Related Genetic Mutations

Presentation of WPs and Deliverables of the Project

Dr. José S. Torrecilla

LCAOS kick off meeting
4th and 5th of April 2011
Technion – Israel Institute of Technology.
Haifa, Israel
LCAOS kick-off meeting

Summary

- What tools are we going to use?
- Why have these tools been selected?
- Examples of successful applications
  - In non cancer field
  - In the cancer field
- LCAOS project duties
What tools are we going to use?

Main tools to make powerful models

- Artificial Neural Networks
- Chaotic algorithms
- Fuzzy logic
- Cellular automates
- Combinations
Why have these tools been selected?

Inputs $\rightarrow$ outputs

$\text{Outputs} = f(\text{Inputs, parameters})$

Models
Why have these tools been selected?

Database treatment
Hidden information extraction

Fractals
Chaos
Artificial Neural Networks
Examples of successful applications


Examples of successful applications

Examples of successful applications

Chaos
• Peter B. Dirks. Brain Tumor Stem Cells: Bringing Order to the Chaos of Brain Cancer. Journal of Clinical Oncology, 28, 17, 2916-2924.

Artificial neural networks

Fuzzy logic
Diagnosing lung cancer

Sensors based on gold nanoparticles

LCAOS project duties

Extracting the hidden information

Estimating chemical concentrations
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