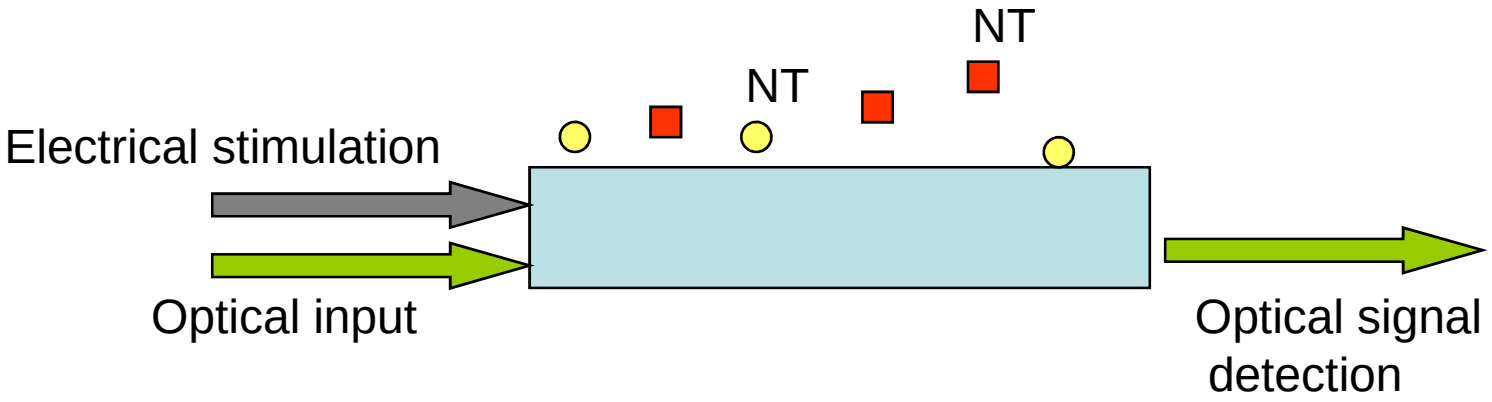
MTRODE

ICT call5

Topic 3.9a

Objective:

Development of a novel nanostructured bioprobe prototype that will allow real-time **simultaneous multiple neurotransmitter (NT) optical detection detection electrical stimulation by independent probes distributed in different regions of the brain.**



Main outcome: M-TRODE proposes the replacement of the actual electrodes by a **new implantable device** that integrates **electric stimulation electrodes** with **optical waveguides and photonic detection.**

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- Technological challenges:
  - Compact integration of three different sensing devices, on approximately **0.3 x 1 mm**.
  - Integration with
    - Electrical electrodes
    - A light source
  - temporal resolutions for the detection of neurotransmitters levels in the range of **200-500 ms**

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- Benefits:
  - a **better understanding** of the effects that DBS causes on the NT levels.
  - far more accurate DBS treatment that will **substantially improve the quality of life**.
  - **new automatic, adaptive and person-based DBS system that will automatically fine-tune the stimulations** to the needs of the patient.

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