**NutriChip Image Processor: A novel way of extracting fluorescent spots in microscopy images**

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**Objectives**
Extracting fluorescent spots [1] in microscopy images. The resulting mask provides access to measurements (intensity, segmented blob sizes, ...) that can be linked with a biological event [2] (e.g. TLR2 expression).

We introduce a novel segmentation algorithm fit for the purpose.
- Tested on images from stimulated (SG group) and unstimulated (NCG group) Caco-2 cells.
- Compared against state-of-the-art methods on the problem of (a) classification and (b) localization.

**Scope**
The NutriChip project proposes to study the impact of dairy products ingestion by human through the use of a Lab-on-Chip platform.

Fluorescently stained biomarkers such as the toll-like receptors 2 and 4 (TLR2-4) are used to get a measurement of the cell immune response.

**Novel algorithm**
Local thresholding algorithm:
- Filters out pixels with low local SNR.
  \[ LSNR = \frac{I \circ B}{I - I \circ B} \]
- Sweeps thresholding values.
- Extracts blobs of pixels of limited size with a local maxima (fluorescent spot).

**Algorithm flowchart**

**Conclusion**
- Novel method for spot extraction.
- Provides useful masks for image classification.
- Recovers more blobs than any other methods when the blob size is limited.

**References**