BTRON

Imaging the immune system and its dynamicity with the CQ1 microscope

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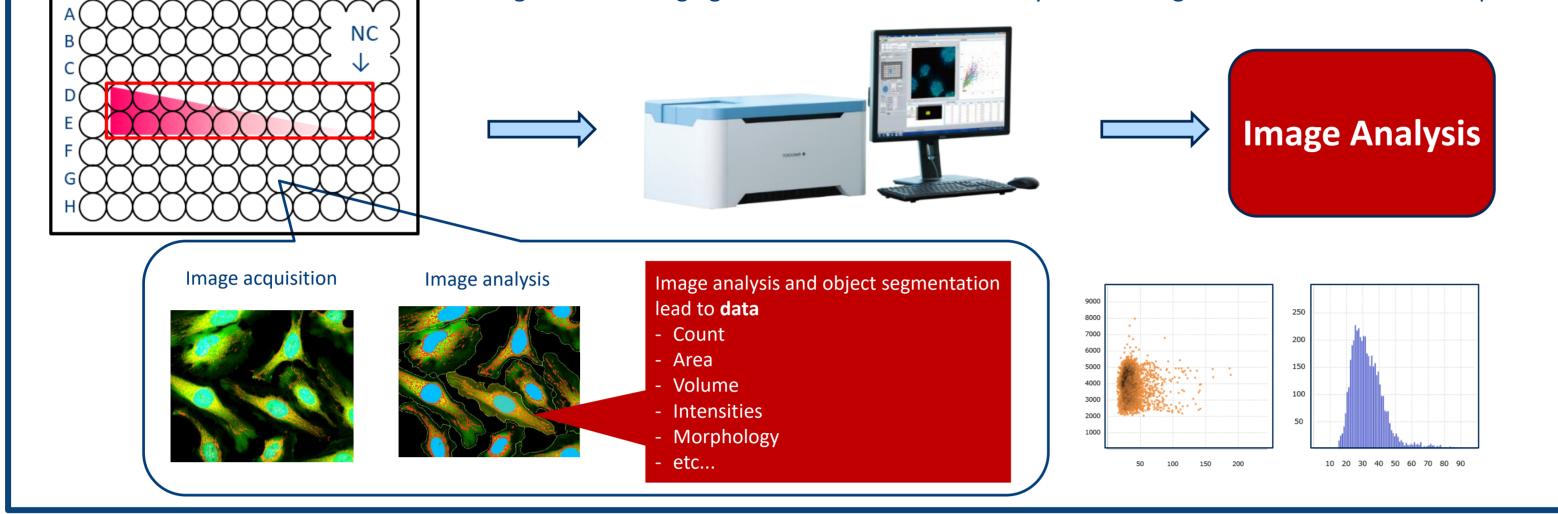


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Background and Objective

Although immunotherapy has substantially increased the survival, just a percentage of patients respond to the treatment. Furthermore, some cancer entities are associated with very poor response to immunotherapy, increasing the need to explore new strategies and to combine existing ones. Our aim is to use high content imaging techniques to study cellular interactions and cellular dynamics in order to dissect the cell-biological mechanisms and the molecular players regulating cancer immunotherapy. We hope to identify new strategies to overcome resistance and improve the success of immunotherapy.

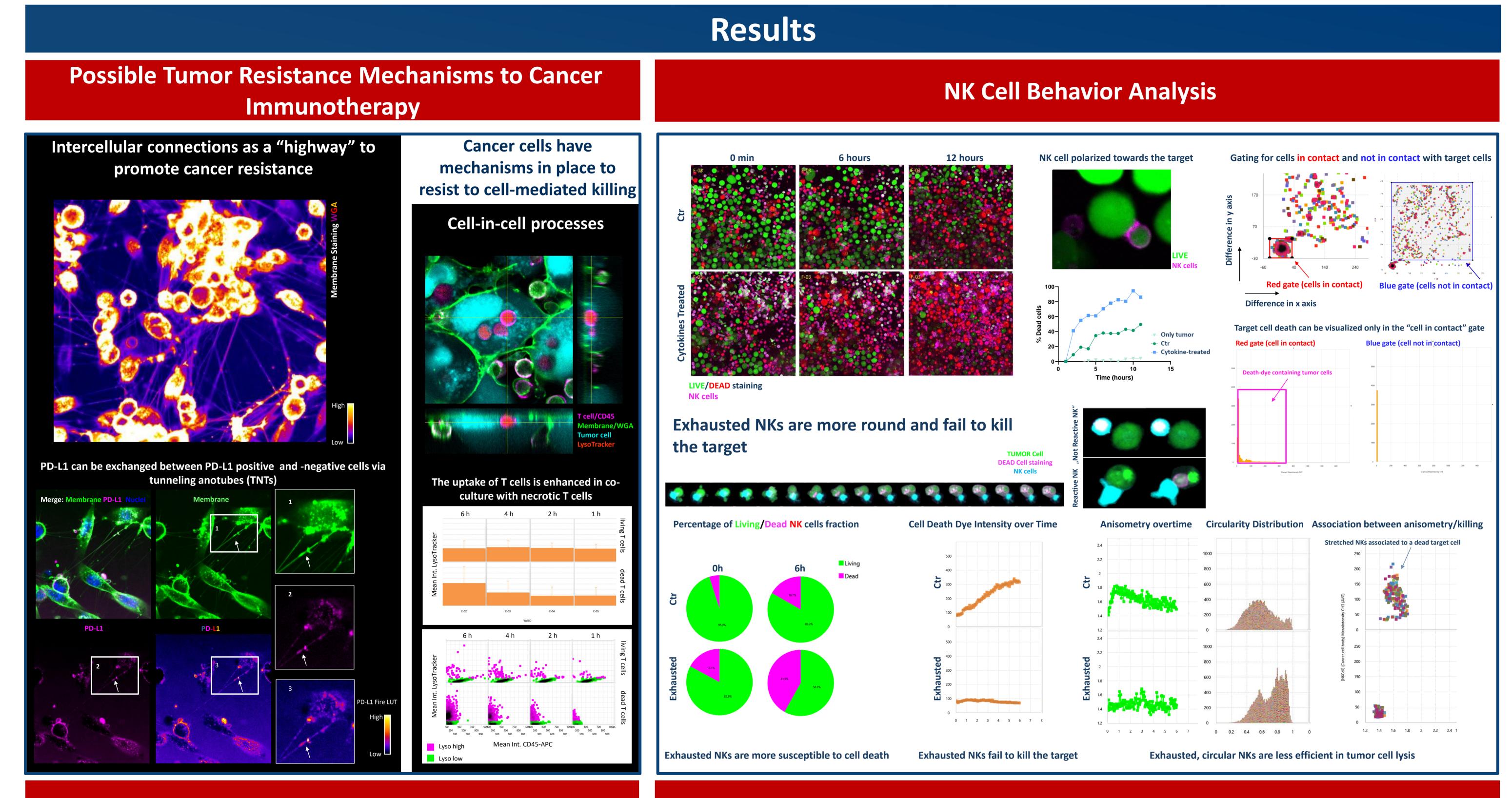
Method	
TRON's automated high-throughput image acquisition and analysis leads to increased assay efficiency	High content imaging and assessment of cellular dynamics using the CQ1 confocal
1 2 3 4 5 6 7 8 9 10 11 12 High content imaging and assessment of cellular dynamics using the CQ1 confocal microscope	microscope



In the past, high content imaging and analysis required highly sophisticated and very voluminous equipment. Furthermore, image analysis used to be very time consuming and laborious.

The CQ1 Confocal Imaging Cytometer from Yokogawa provides access to benchmark quality high content data from 2D and 3D cellular assays for any lab benchtop. Screening experiments on multiwell plates are possible as well as its use as a very fancy microscope for slides or dishes, the CQ1 and the respective analysis software CellPathFinder bring amazing insights to any cell lab.

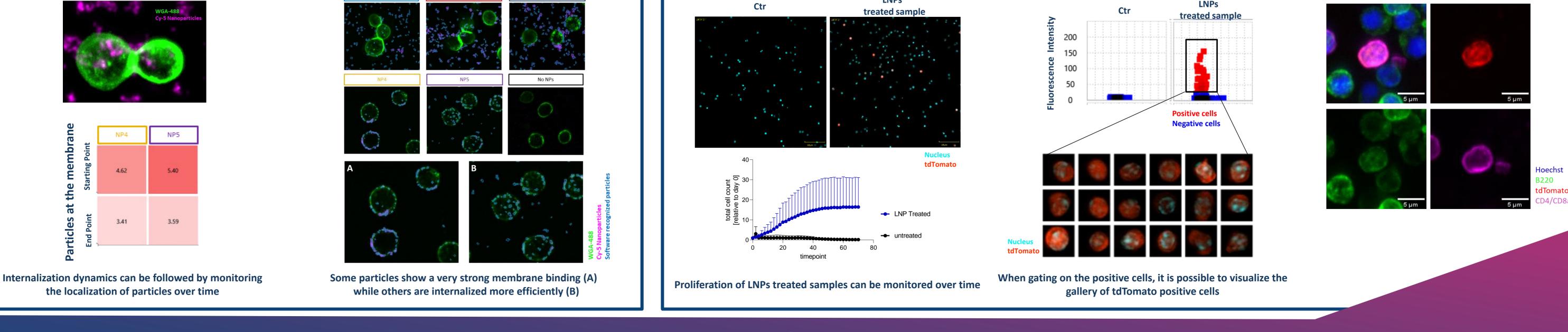
The latest generation of Yokogawa's patented microlens enhanced spinning disc CSU-W1 combines amazing speed with reduced cell damage, and the option for robotic integration offers remarkable throughput when needed.



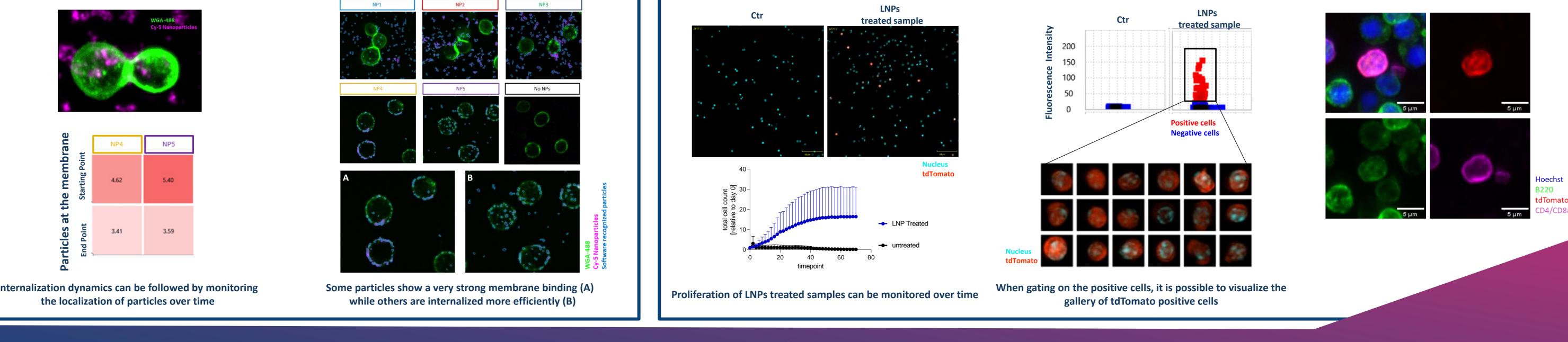
Uptake of Nanoparticles

Delivery of mRNA via Functionalized Nanoparticles

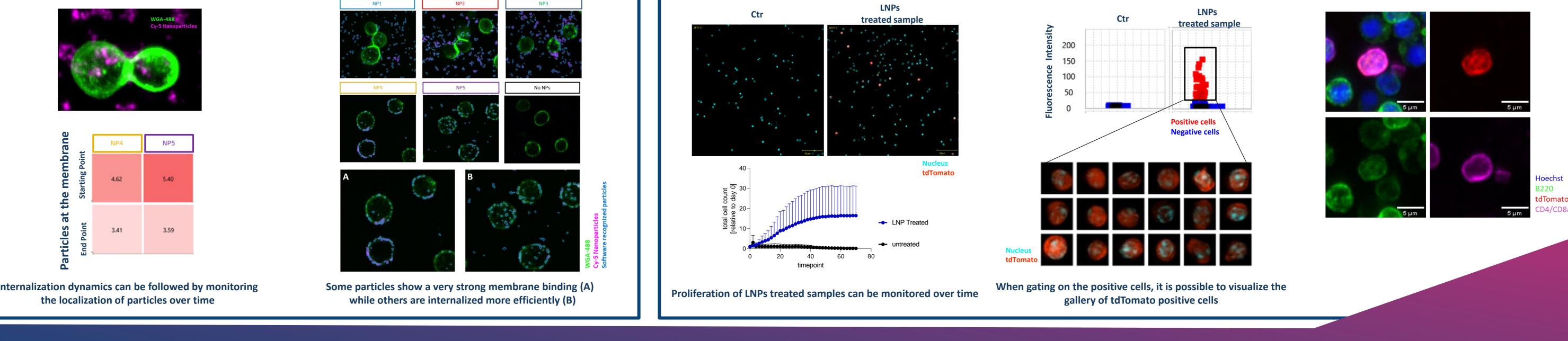
Nanoparticles can be visualized and their behaviour can be analysed



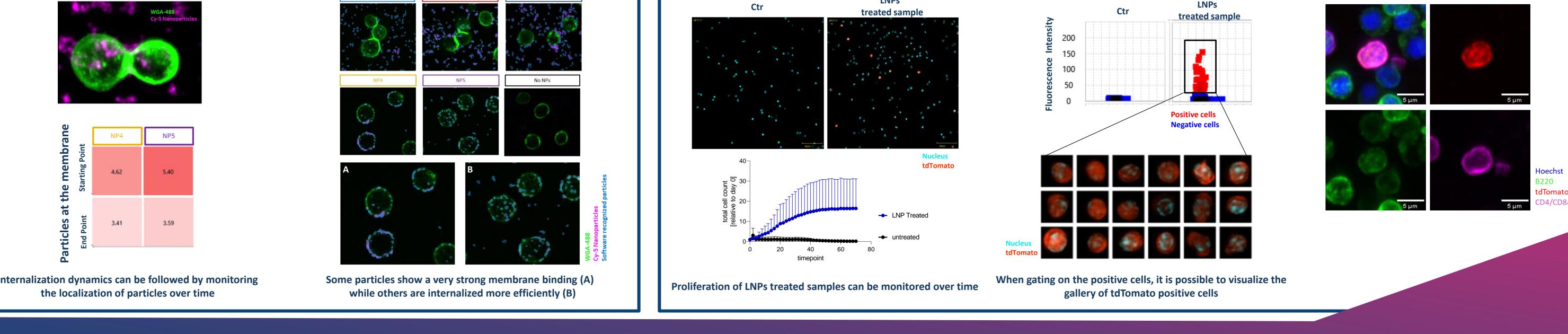
Different Nanoparticles perform differently with regards to aggregation, binding and internalization

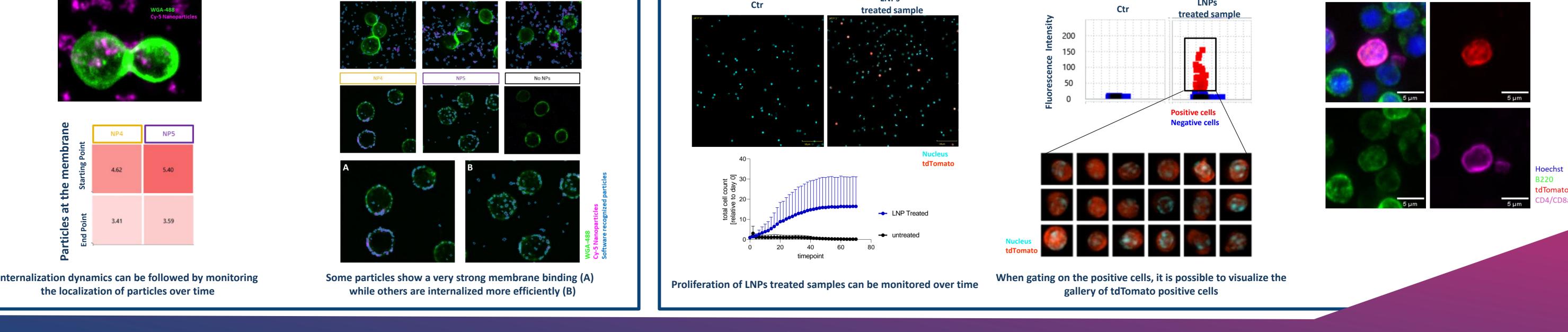


Cre-recombinase mRNA delivery via nanoparticles lead to tdTomato expression in Cre-tdTomato reporter T cells



The number of tdTomato positive cells can be T cells expressing tdTomato in PBMCs can be visualized quantified at all time points





Conclusion

The study of cellular dynamics in a high throughput fashion enables the dissection of another layer of complexity that can open up new therapeutic strategies.

Acknowledgments: We would like to thank Isabell Keil, Ayline Kübler, Sophie Linkenbach and Meike Gangluff (BioNTech) for providing experimental samples and fruitful discussions. Mustafa Diken, Sebastian Kreiter and Andrée Rothermel for their constant support.

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