

# SPION-CCPMs: Iron nanoparticles as adjuvant lung cancer therapeutic

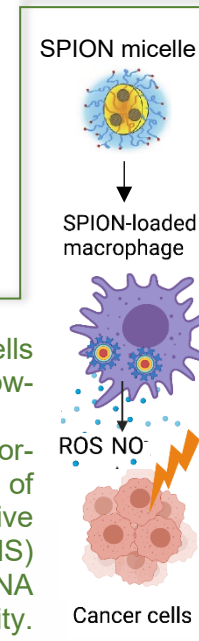
## Challenge

- Macrophages play a central role in inflammatory processes but also in iron metabolism.
- The interplay of these two functions has therapeutic value, as macrophages are activated by iron accumulation and thereupon exert beneficiary effects such as the killing of cancer cells.
- However, the degree of iron-mediated physiological effects critically depends on the application form of iron.
- New forms of iron oxide nanoparticles and their administration are needed as basis for therapy, e.g. to induce an anti-tumor phenotype in macrophages.

## Technology

Novel iron-loaded nanoparticles (super-paramagnetic iron oxide nanoparticles-loaded core cross-linked polymeric micelles; SPION-CCPMs) with several advantages:

- Redox-responsive
- Controlled iron release
- Triggering of higher inflammatory responses
- Wide range of conceivable therapeutic applications (cancer, immunotherapy etc.)



Co-culture of Lewis lung carcinoma cells (LLCs) & primary murine bone marrow-derived macrophages:  
SPION-CCPMs → Activation of tumor-associated macrophages → secretion of inflammatory cytokines and reactive oxygen/nitrogen species (ROS/RNS) → Induction of oxidative stress and DNA damage → Reduction of tumor cell viability.

## Intellectual Property

Priority application filed 27.11.2020, PCT filed 26.11.2021 (PCT/EP2021/083200).

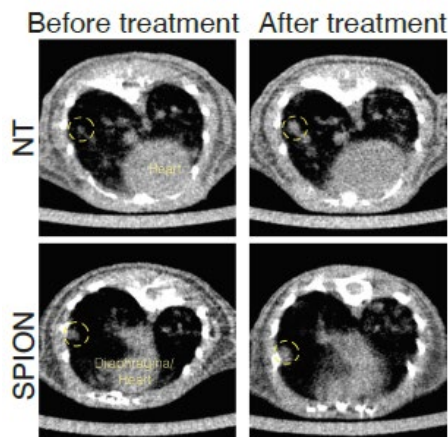
## Commercial Opportunity

We offer a technology with proof of concept in vitro (primary murine and human cells) and in vivo (C57Bl/6N mouse model). A technology evaluation program is available as well as a licensing or collaboration/co-development opportunity.

## Further Reading

[Costa da Silva et al. 2017](#)

[Bauer et al. 2021](#)



In an in vivo lung cancer mouse model SPION instillation reduced lung tumor burden.

## Internal EMBLEM Reference

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