# Encapsulated paramagnetic particles for targeted delivery and locally controlled drug release

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A novel targeted drug delivery and release system has been developed and successfully tested in a xenograft tumor model. The system consists of nanoparticles equipped with tumor targeting peptides. These particles are designed to carry drugs that can be released by locally applying a magnetic field. First proof-of-concept in vivo studies for a tumor targeting nanosystem have been successful.

A patient derived xenograft tumor model in the mouse was used. Initial results show no side effects (figure 2, 3) but a significant inhibition of tumor growth (figure 1). Furthermore the delivery and release system is more efficient than the standard therapy with the non-encapsulated drug.

This system was developed by a multidisciplinary group of partners including **AIN** (Spain), **EPO Berlin** (Germany), **Idifarma** (Spain), and **IZI** (Germany). This consortium comprises of partners with expertise in the pharmaceutical and biotechnological field and capacities to develop drug formulations, pilot-scale GMP manufacturing, DMPK and preclinical studies.

We are presently looking for industrial collaborators to further develop the system and as future licensing partners.

**Proof of concept: Inhibition of tumor growth**

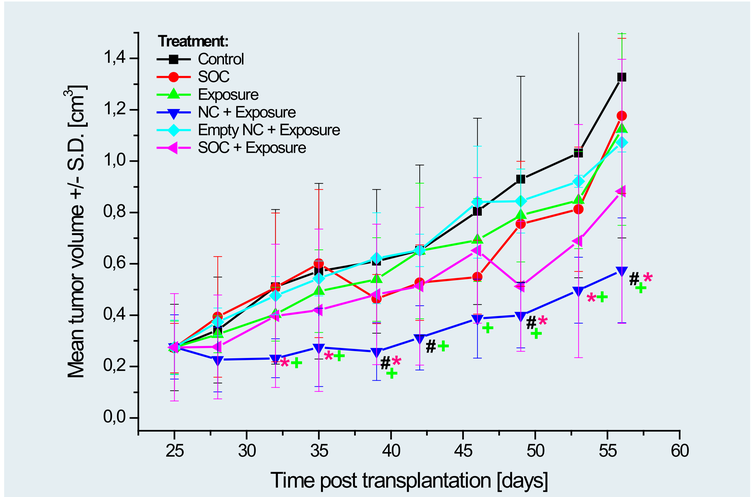


Figure 1: Xenograft tumor model treated with nanocarrier for targeted drug delivery and triggered drug release.

Renal PDX REN11619 bearing mice were treated at day 0, 2 and 4 after stratification with the nanocarrier, followed by magnet field exposure 2 h post treatment.

#: significantly different to control;
*: significantly different to SOC,
+: significantly different to Exposure.
Mann-Whitney nonparametric U-test, $p<0.05$.

SOC = Standard operation protocol
NC = Nanocarrier

**No side effects due to targeted drug delivery and release**

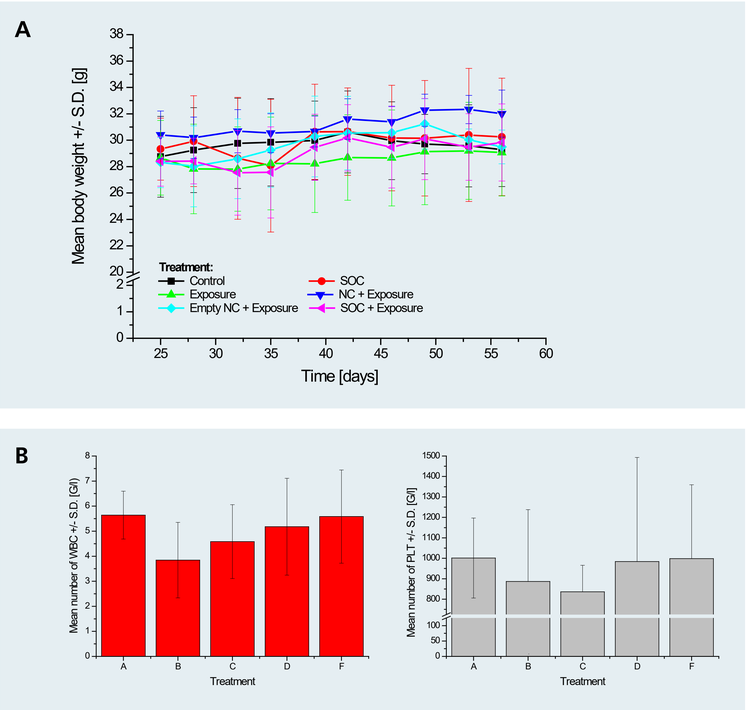


Figure 2: Impact of treatment on body weight and blood composition

**(A)** REN11619 bearing mice were treated at day 0, 2 and 4 after stratification and body weight was measured at indicated days.
**(B)** Blood samples were taken at day 36 and analyzed for composition.

Treatments: (A) Saline, (B) SOC, (C) Exposure, (D) NC+Exposure, (F) SOC + Exposure

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