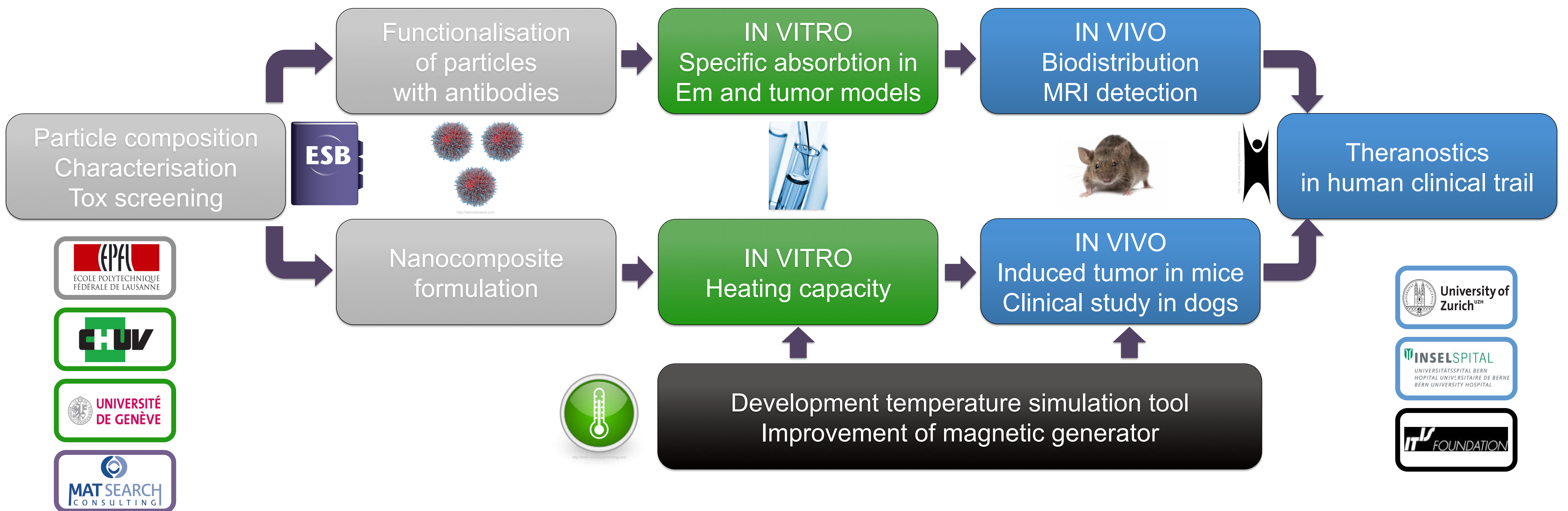


# From superparamagnetic nanoparticles to cancer detection and treatment

H. Richter<sup>1</sup>, H. Thoeny<sup>2</sup>, M. Stuber<sup>3</sup>, O. Jordan<sup>4</sup>, N. Kuster<sup>5</sup>, B. von Rechenberg<sup>1</sup>, P. Kircher<sup>1</sup>, H. Hofmann<sup>6</sup>

<sup>1</sup>University of Zurich, <sup>2</sup>Inselspital, <sup>3</sup>CHUV, <sup>4</sup>University of Geneva, <sup>5</sup>ITIS, <sup>6</sup>EPFL

## Project Layout



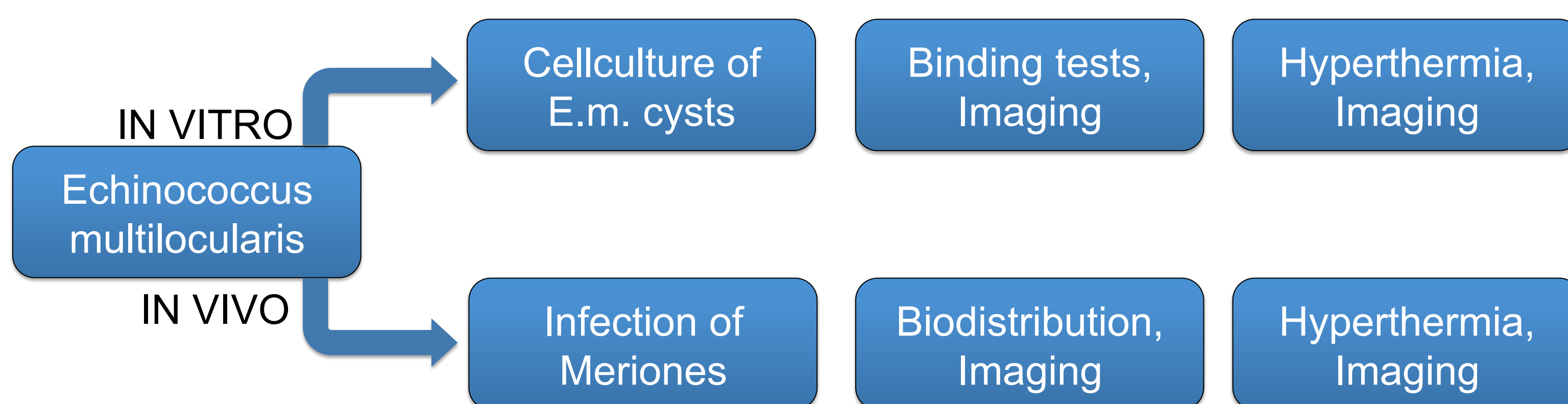
AIM: **diagnostic** (MRI) and **treatment** (hyperthermia) of **lymph node metastases** of prostate cancer = **Theranostics**

## Experimental Results and Challenges

### Tumor model & marker: MatLyLu, PSMA, LNCap, VX2

- The definition of a suitable tumor marker is difficult because the limiting factor is the small size of the affected lymphnodes in animal tumor models. With special "Micro Coils" we are able to scan rodents in a 3 Tesla MRI.
- A lot of different animal models and species are discussed. It seem to be feasible to use a PSMA, LNCap or a MatLyLu model in rats as well as a VX2 rabbit tumor model in rabbits.

### Proof of principle: Echinococcus multilocularis



- Positioning of Gerbils (Meriones spp.) for MRI scan in between special "MicroCoils"
- 2-4) T2 weighted Image of a Gerbil after 2 months of intraperitoneal infection with Echinococcus multilocularis in different orientation and location
- 5) Image of a Gerbil during dissection with massive abdominal cysts of Echinococcus multilocularis
- 6) Image of a culture flask with Echinococcus multilocularis cysts 1.5month after cultivation

