Introduction:
Our aim is to evaluate the impact of crystalloid fluids on immune cells. Intensive care unit (ICU) patients’ inflammatory status can switch from an early pro-inflammatory to a late anti-inflammatory phase, which favors infections. They can receive different crystalloids, either Normal Saline (NS), Ringer’s Lactate (RL) or Plasma-Lyte (PL). High chloride concentration present in NS has been associated with various complications [1], whereas high doses of NaCl have inflammatory effects on immune cells [2]. However, the immune consequences of crystalloids in humans are ill-defined.

Methods:
Using our comprehensive immunemonitoring platform, we assessed the immunological phenotype of peripheral blood mononuclear cells (PBMC) in humans. 11 healthy subjects received a liter of NS, RL and PL. Blood samples were taken before and 6h later. PBMC phenotypes were assessed by flow cytometry and cytokine concentrations were measured by a multiplex assay. 9 off-pump cardiac surgery patients were also randomized to receive either NS, RL or PL during surgery and their stay in the ICU. Blood samples were drawn at various time-points. All leucocytes were analyzed in a similar fashion. We are still recruiting.

Results:
Study of healthy subject’s PBMC suggested that RL reduced classical monocytes, whereas NS increased lymphocyte activation and IL-17 and MIP-1b levels. In cardiac surgery patients, our preliminary results suggested that RL and PL reduced classical monocytes and increased non-classical monocytes compared to NS. Neutrophils were also affected differently by crystalloids, where NS seemed to activate them more.

Conclusion:
Our results suggest that crystalloids have different immune consequences. A better understanding of their immune modulation will lead to personalization of their use according to the inflammatory status of patients to restore their immune homeostasis.

References:
1. Annane D et al. JAMA 310:1809-17, 2013