Detection of Circulating Tumor Cells for cancer screening in atherosclerosis

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Objective: To evaluate circulating tumor cells (CTC) detection for early diagnosis of smoking-associated cancers in high-risk patients

Methods: DETECTOR Project is an ongoing prospective cohort study in two French University hospitals, started in January 2017.
- Patient population: smokers or former smokers (≥30 pack-years, quitted ≤15 years), ≥55–80 years, with atherosclerotic peripheral arterial disease or abdominal aortic aneurysm.
- Three screening rounds with low-dose chest CT (LDCT) and CTC search with ISET, at one-year interval.
- The Isolation by Size of Epithelial Tumor cells (ISET) = a blood filtration-based approach detecting rare circulating non-hematologic cells on a 10mL blood sample
- In case of incidental lung nodule => diagnostic management according to nodule volume, volume doubling time and CTC+
- In case of negative LDCT and presence of CTC => contrast enhanced whole-body PET/CT for extra-pulmonary malignancy screening.

Conclusion: By considering CTCs detection in high-risk selected population for tobacco-induced cancer, we expect to detect earlier pulmonary and extra-pulmonary malignancies, at a curable stage.

Figure CTC
Malignant features in cytopathological analysis (4 of the following criteria): anisonucleosis, large nuclei, irregular nuclei, presence of tridimensional sheets and a high nuclear/cytoplasmic ratio

We expect the inclusion of 300 patients to be completed in December 2019.
124 patients have already been included, among whom 31 presented with CTC (26%). Three cancers have been diagnosed (one parotid cancer and 2 lung cancers).