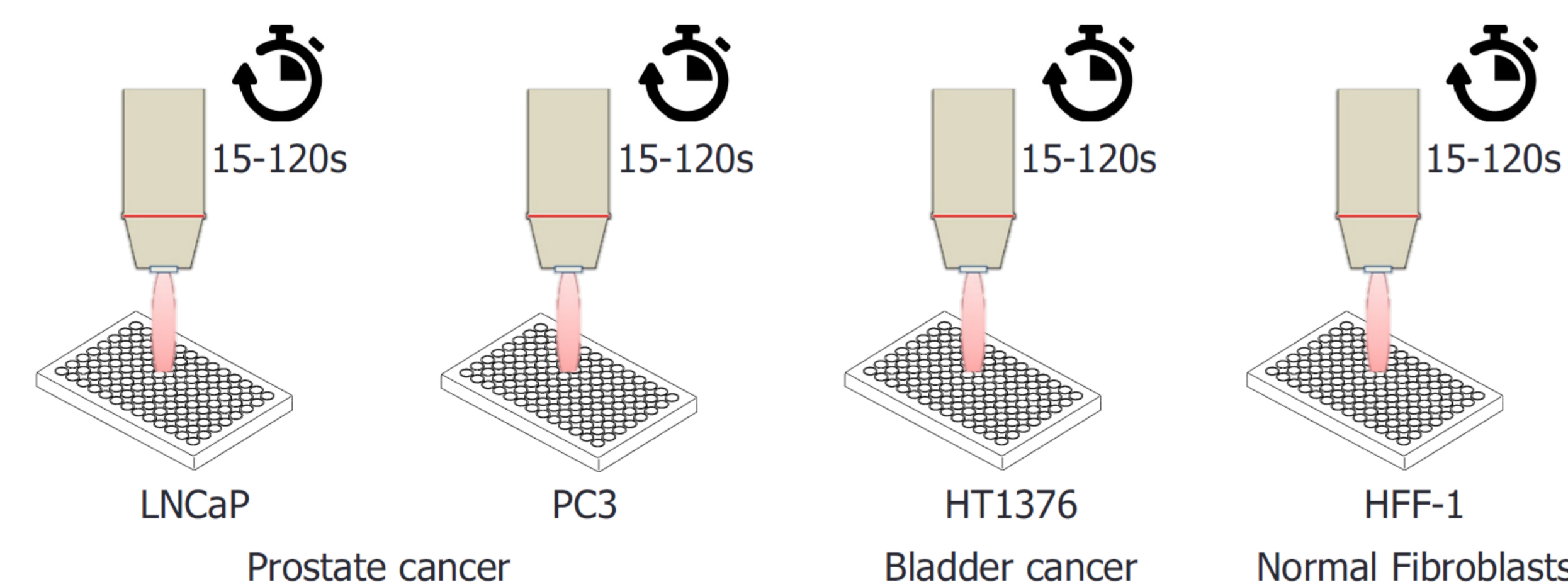


## BACKGROUND

- Plasma is also called the fourth state of matter
  - Ionized gas composed of reactive species, electrical and excited particles, among other properties
- Cold atmospheric plasmas (CAP) recently came into the attention of medical society
  - They are produced at a temperature below 40.°C → their use does not cause thermal damage
  - Non-inflammatory selective ablative effects in tumor cells
  - Effects result from interactions between plasma components with specific structural cell elements and cell functionalities – oxidative stress response, mitochondrial function, cell cycle regulation and cell death pathways
- Plasma therapy is still a developing field, but it seems to be effective against a wide range of tumors
  - Melanoma, Glioblastoma, Breast, colon, lung and cervix cancer
  - Knowledge of CAP effect on urological cancers is not yet well established
- Goal:** This work aims to evaluate cytotoxicity of CAP in prostate and urinary bladder cancer cell lines

## MATERIALS AND METHODS

- Our group developed an electronic device capable of generating high output voltage that can ionize a significant fraction of air particles producing cold atmospheric plasma (CAP)
- Cell lines - plated in a concentration of 50.000-100.000 cells/mL in 200pL of cell culture medium
  - Prostate adenocarcinoma - LNCaP and PC3
  - Urinary bladder carcinoma - HT1376
  - Phenotypically normal human fibroblasts cell line - HFF-1
- The device was designed to expose cell cultures seeded in multiwell plates to short periods of CAP
  - Range from 15 to 120 seconds

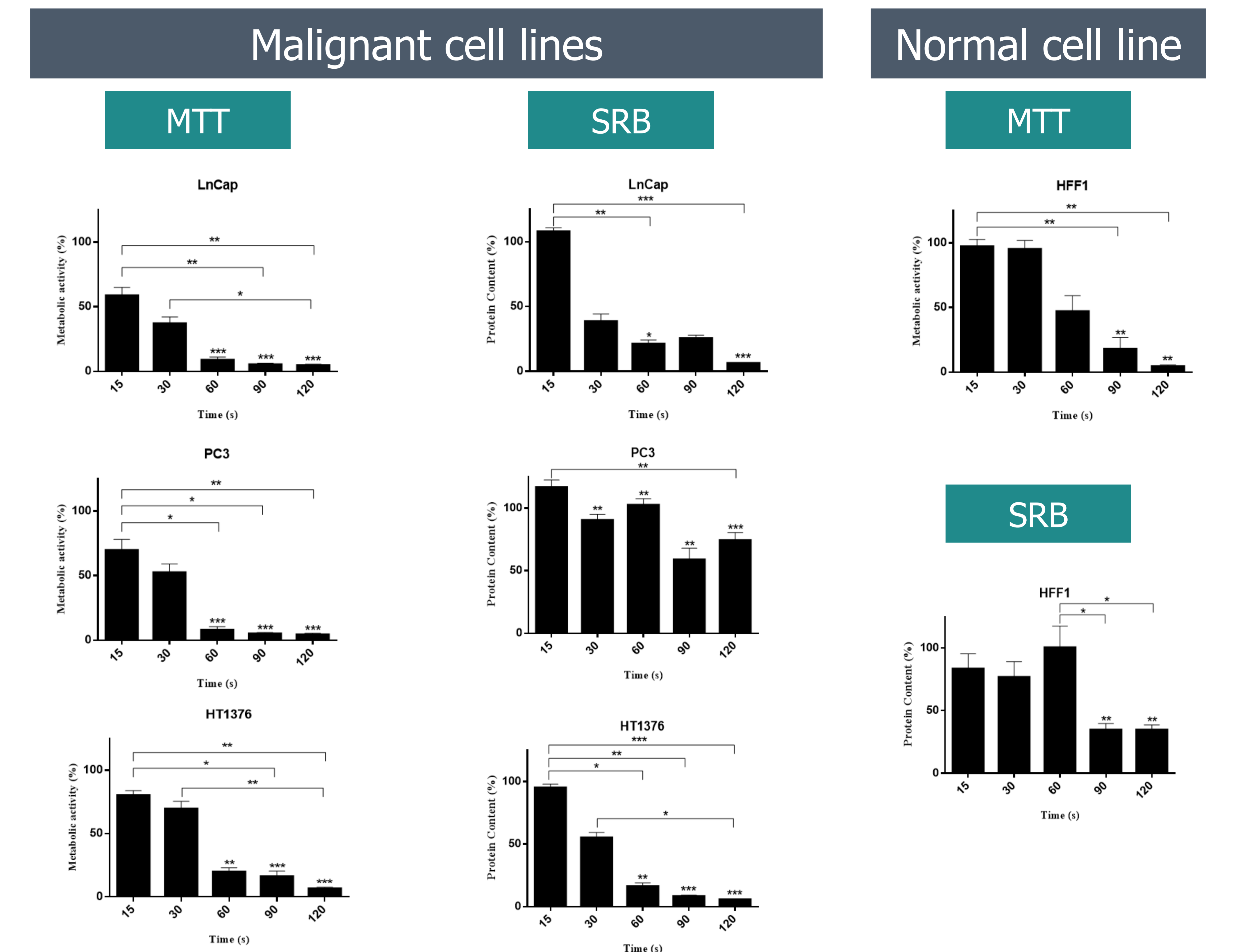


- Metabolic activity (MA) and protein content (P) were assessed with colorimetric assays MTT and SRB

## DISCUSSION/CONCLUSION

- CAP was able to reduce the MA of all 3 cancer cell lines by more than 80%.
  - PC was also greatly reduced in LNCaP and HT1376 lines, but in PC3 remained almost intact
  - This could be due to different cell functions derangement or due to activation of different cell death pathways
- CAP has shown a great anti-tumor effect
  - It may offer a selective anti-tumor therapy capable of providing tumors ablation after brief exposures → in a range of seconds or minutes
  - Spares normal adjacent tissues.
- In the future, with more studies, it could be used to treat superficial cancers, like bladder cancer, or to obtain an oncological sterilization of the surgical margins, like after a radical prostatectomy

## RESULTS



In figure MTT and SRB assay results 24 h after plasma therapy application in different human cell lines: prostate adenocarcinoma (PC3 and LNCaP), urinary bladder carcinoma (HT1376) and fibroblasts (HFF1) at distinct times: 15, 30, 60, 90 and 120 seconds (s)

Results are expressed as percentage of protein content normalized to control

Legend: \* p<0,05; \*\*p<0,01; \*\*\*p<0,001