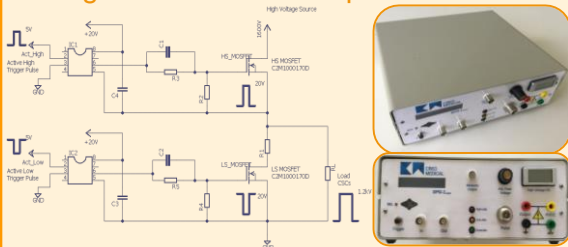


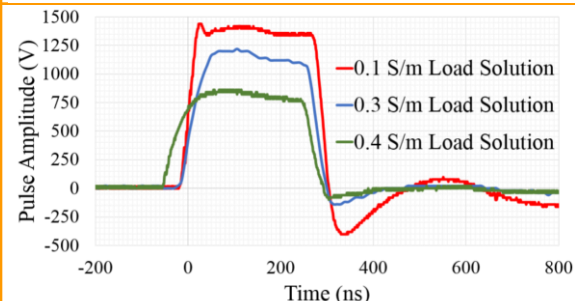
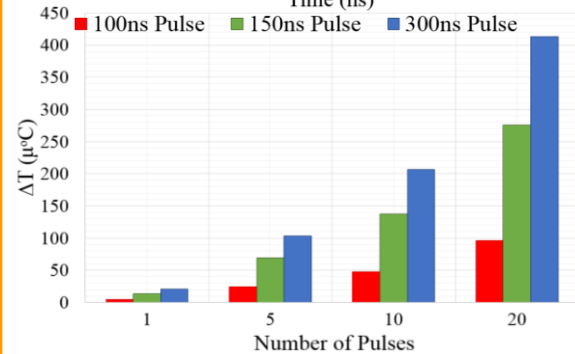
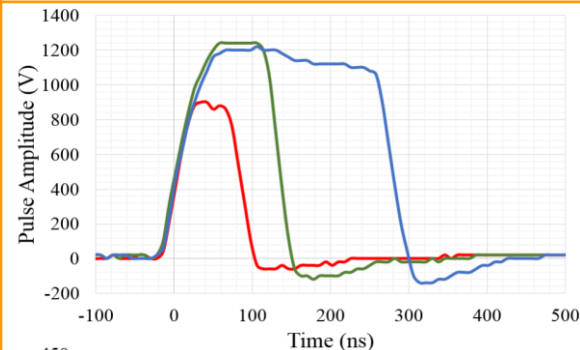
# Push-Pull Configuration of High Power MOSFETs for Generation of Nanosecond Pulses for Electroporation of Cancer Stem Cells

I. W. Davies, C. Merla, M. Tanori, A. Zambotti, J. Bishop, C. Palego and C. P. Hancock

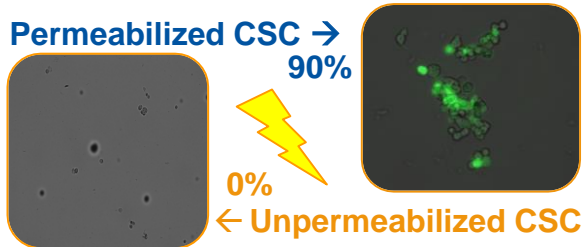
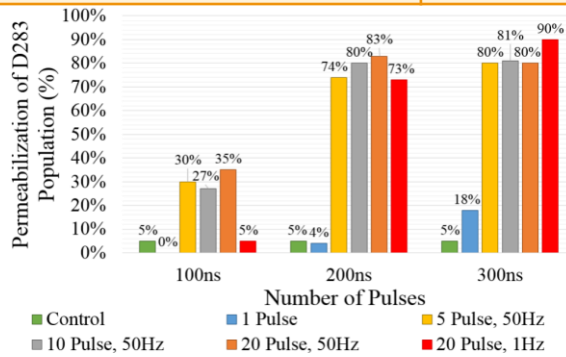
**Introduction:** Develop a high voltage (1kV+), 100ns-300ns nanosecond pulsed electric field generator for electroporation (neutralization) of Cancer Stem Cells (CSCs)



Figures include: Image of the nanosecond pulse generator and its modular design. Measured pulses on CSCs, non-thermal effect calculation and permeabilization results from CSCs exposure to generator pulse electric field



Parameter	Range
Repetition Frequency	1Hz – 50Hz
Pulse Width	80ns -1μs
Number of pulses generated successively	1 -1000 and Continuous
Pulse Amplitude	280V-1400V



## Conclusions

- Generate a **symmetrical pulses** ( $t_r=t_f$ ) of various pulse widths and amplitude in excess of 1kV.
- With **minimal overshoot and ringing**
- Performance exceeds simulation
- Non-thermal effect.**
- Irreversibly permeabilise 80 % of D283. Cancer Stem Cells population with 5 or more of 300ns pulses.**
- A **versatile generator is developed** with large range of pulse parameters to be selected.

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