

Characterization by Electrical Impedance of an In Vitro Model Based on Tumor Cell Spheroids

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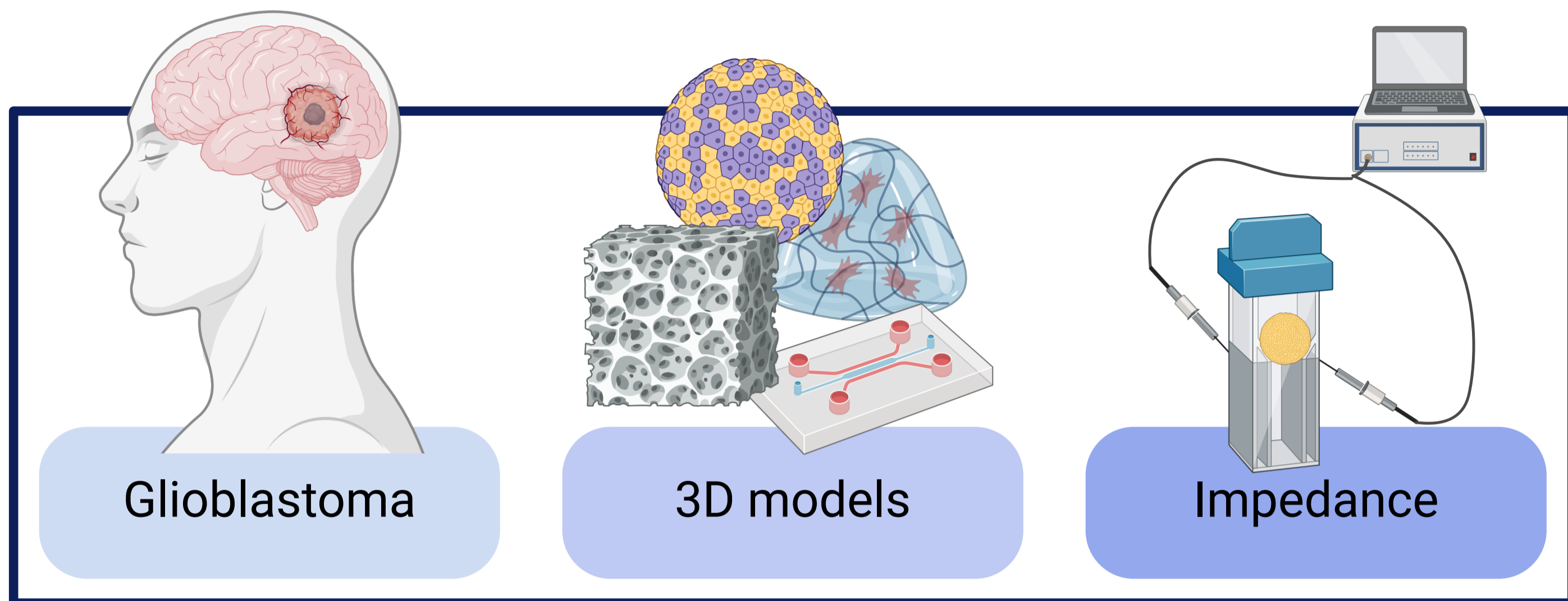
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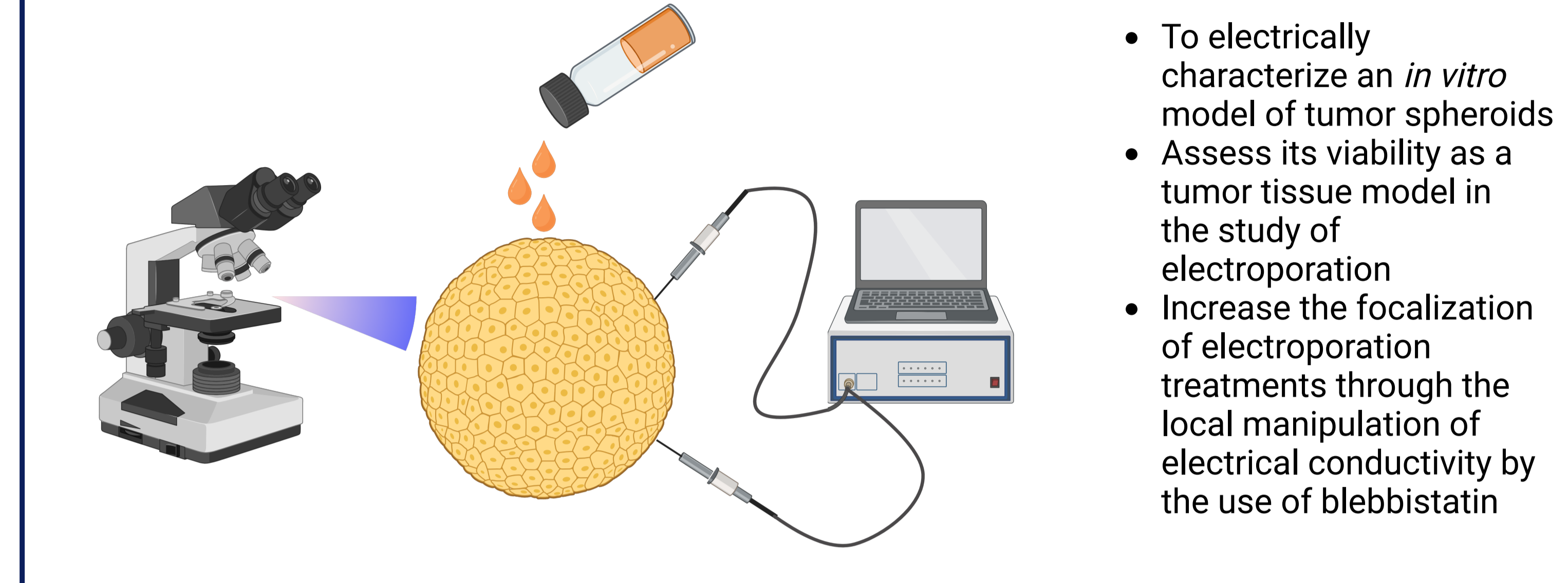
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INTRODUCTION



OBJECTIVES



METHODS

- U-251 MG cell line
- "Non-adherent surface" (NAS) method
 - 30,000 cells in round bottom wells
 - Antiadherent solution
 - Centrifugation
- Blebbistatin
 - 2 days after the spheroids seeding
 - Final concentration of 10 µg/mL
 - Medium refreshed after 3 days
 - Maintained for 3 days more
- Small modified electroporation cuvette
 - 1 µL hole
- Impedance LCR analyzer
- Spheroid immersed in its medium

RESULTS

SPHEROIDS REDUCE THEIR SIZE OVER TIME

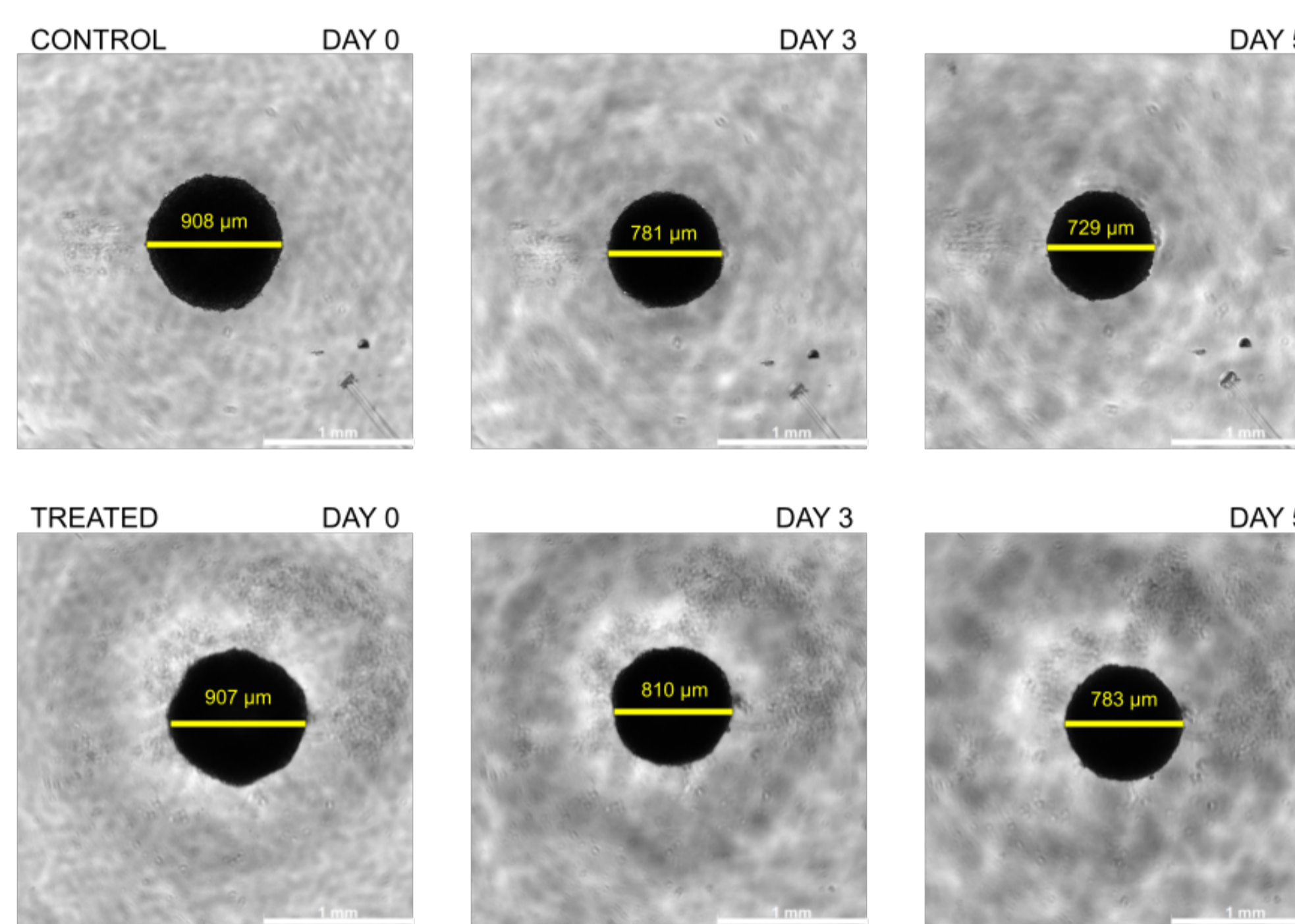


Figure 1: Evolution over time of two different spheroids (30,000 initial U-251 MG cells both) Phase contrast microscopy

BLEBBISTATIN SMOOTHENS THIS REDUCTION IN SIZE

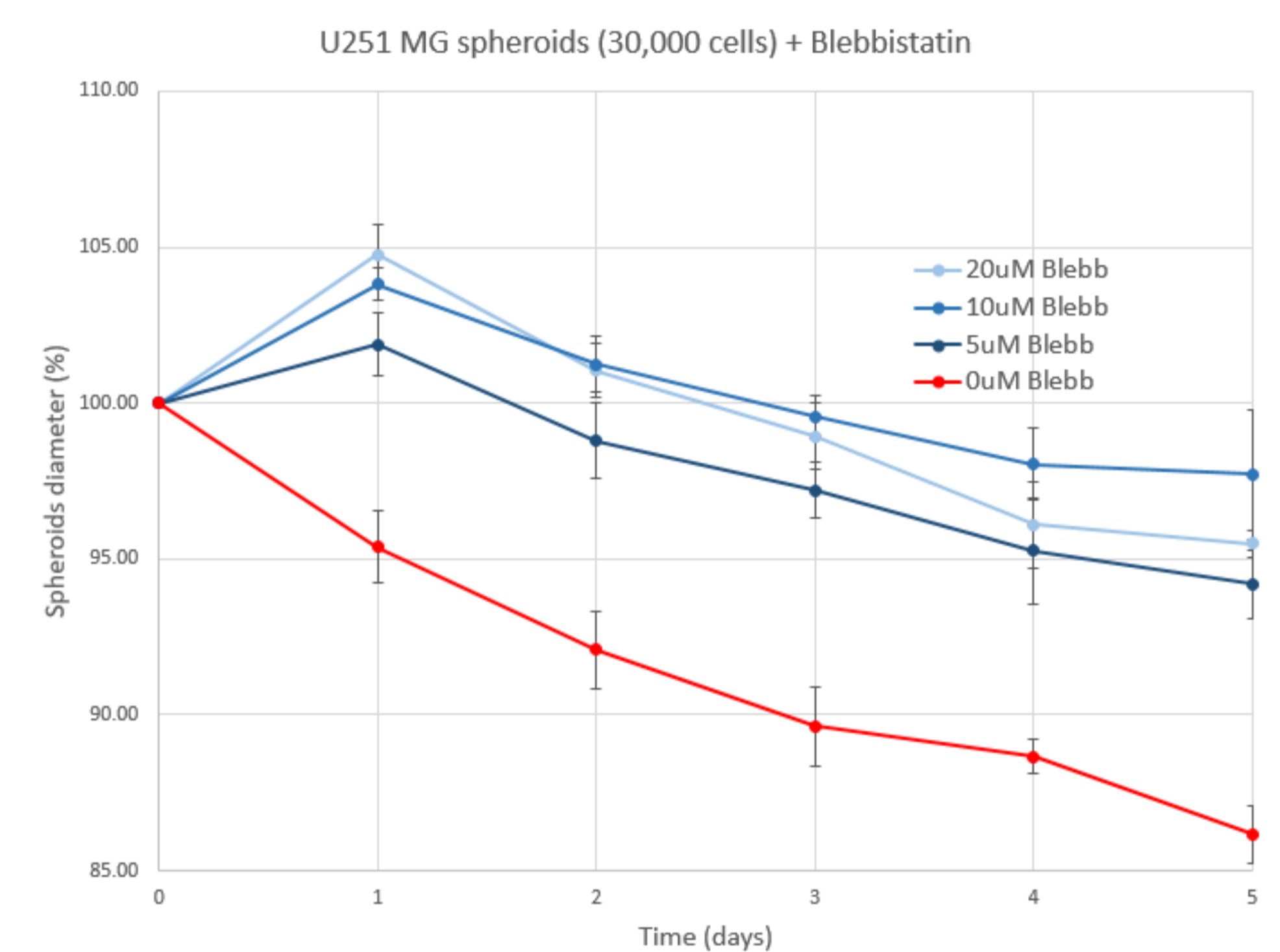


Figure 2: Evolution of the diameter of the spheroids, normalized respect the original size

BLEBBISTATIN INCREASES ELECTRICAL CONDUCTIVITY IN SPHEROIDS

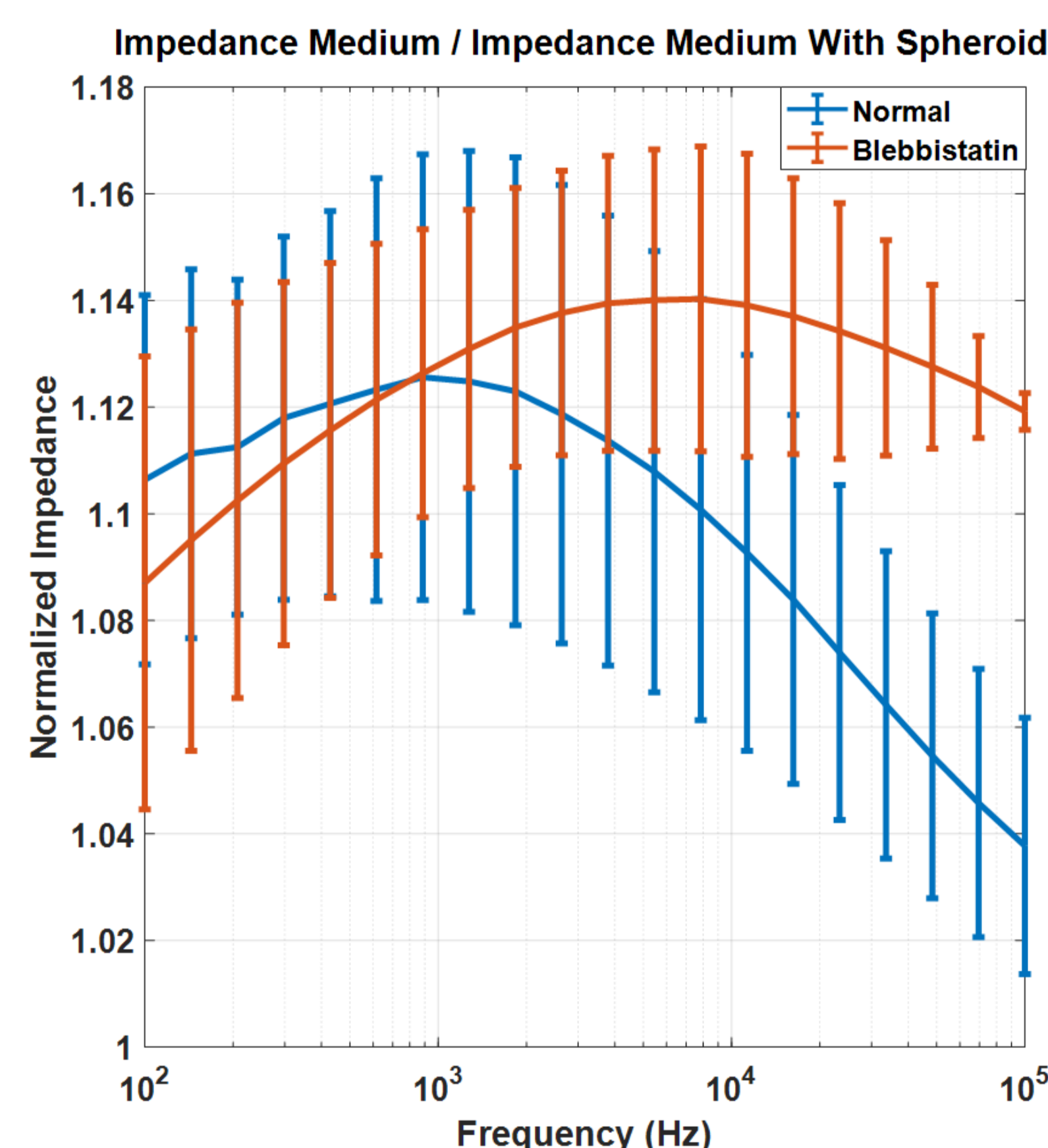


Figure 3: Impedance assay

BLEBBISTATIN CONCENTRATES THE ELECTRIC FIELD

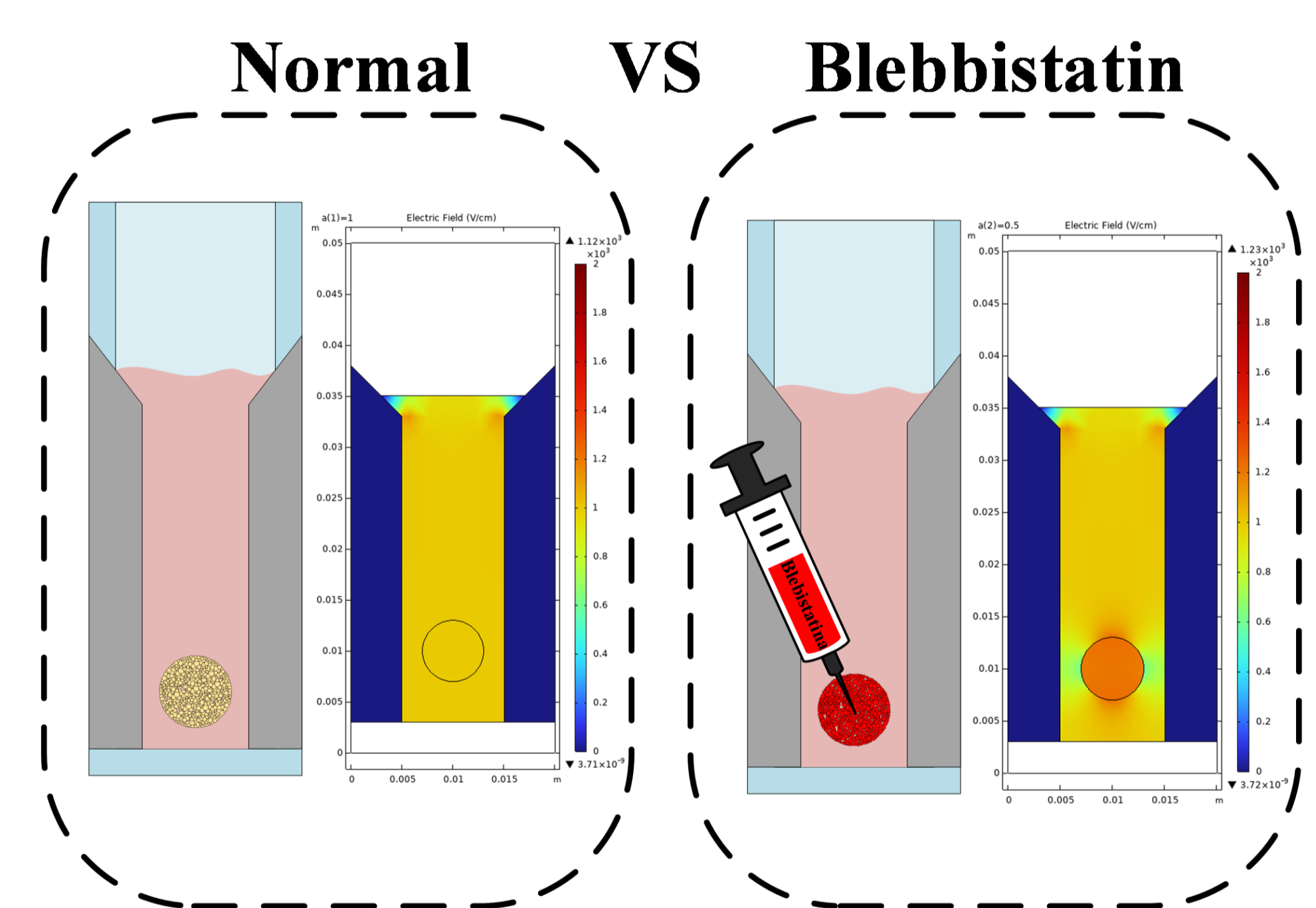
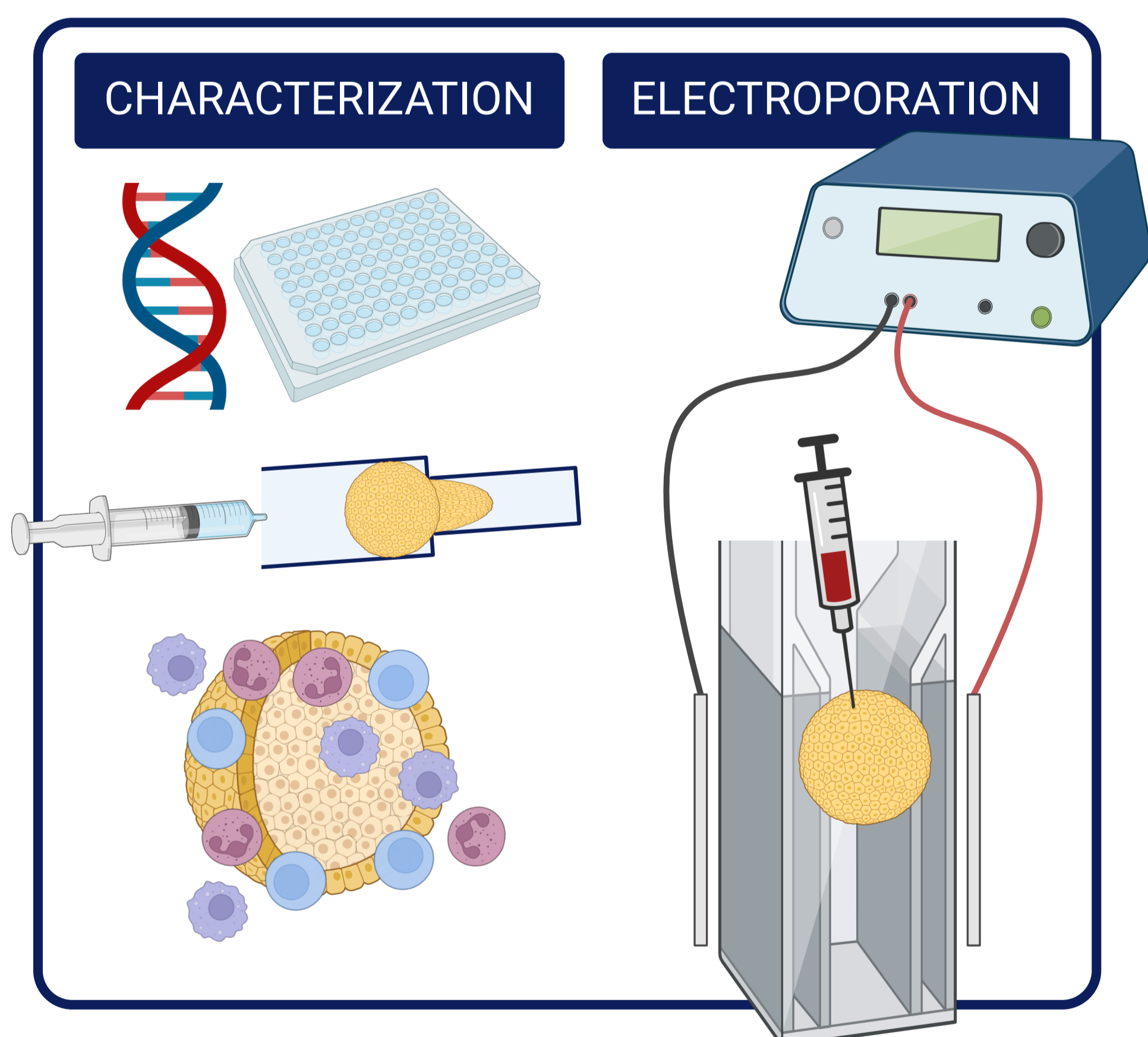


Figure 4: Computational simulation (*in silico* model) of the electric field in the designed microcuvette

NEXT STEPS



Blebbistatin has proven to be a molecule capable of **relaxing the intercellular forces** present in GBM spheroids, thereby reducing the **degree of compaction** of these spheroids.

Electrical impedance tests may be appropriate for estimating the magnitude of **physical changes** in tissue structure as they may modify its electrical parameters.