ESTABLISHMENT AND CHARACTERIZATION OF THREE-DIMENSIONAL CELL CULTURE METHOD FOR PHARMACOLOGIC STUDIES IN GASTRIC CANCER CELL LINES

Silva EL[1]; Valente VMS[1]; Andrade FRS[2]; Bezerra ECA[1]; Mesquita FP[1]; Aragão DR[1]; Lima OG[1]; de Oliveira LLB[1]; Nunes CFAM[1]; Jorge RJB[2]; Moraes MEA[1]; Montenegro RC[1]

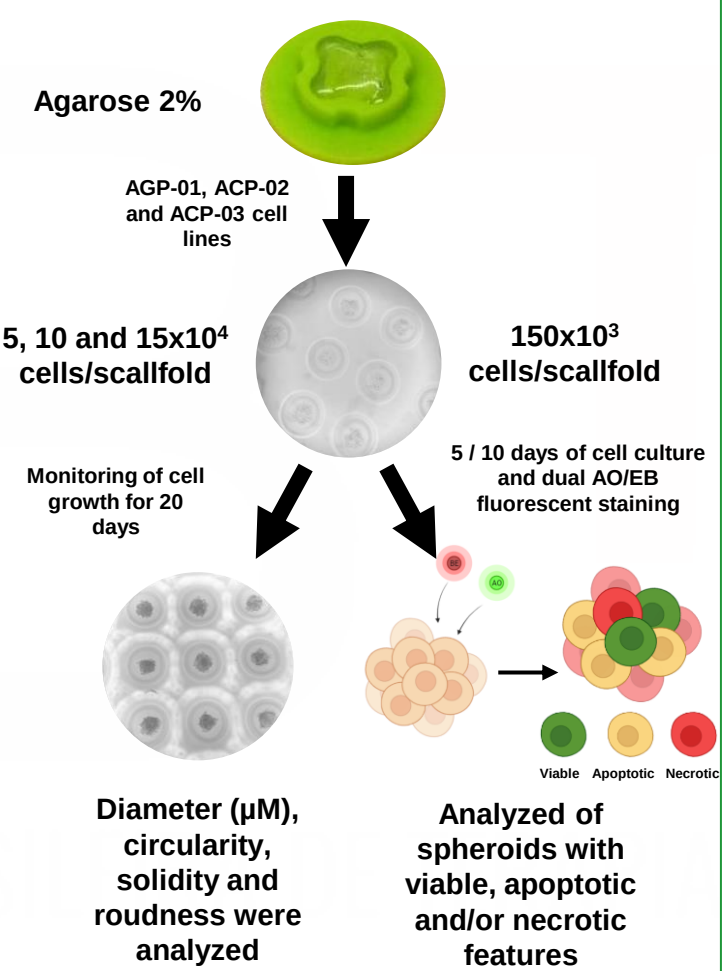
[1] Department of Physiology and Pharmacology, Laboratory of Pharmacogenetics, Drug Research and Development Center (NPDM), Federal University of Ceará, Fortaleza, Brazil.

[2] Department of Physiology and Pharmacology, Laboratory of Toxinology, Drug Research and Development Center (NPDM), Federal University of Ceará, Fortaleza, Brazil.

INTRODUCTION

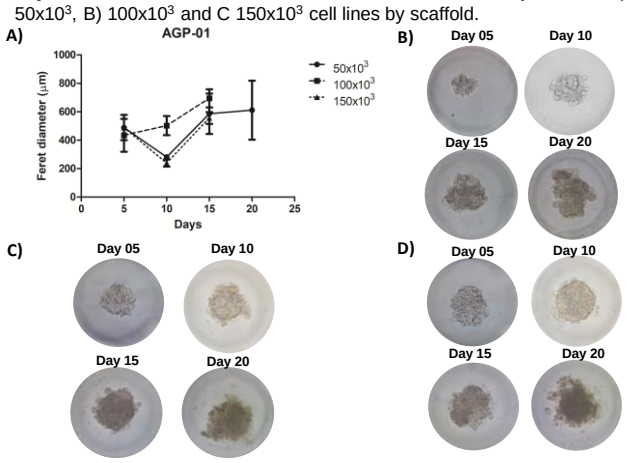
Gastric cancer (GC) is a major health problem, corresponding as the fifth most common kind of cancer in the world (5.6% of cases) and the fourth in the number of deaths (7.7%) (1). Several studies involving the antitumor potential of new chemotherapy are based on monolayer (2D) culture, which often fails to provide a tumor environment more similar to the in vivo environment, (3D) culture techniques aim to create a study model with greater similarity to the tumor microenvironment, being a more accurate tool in the screening and study of new drugs with antitumor potential (2). Thus, this study aims to establish and characterize the 3D cell culture model of adenocarcinoma gastric tumor cell lines AGP-01, ACP-02, and ACP-03 as a tool for future pharmacologic studies.

METHODS



RESULTS

Figure 1. Spheroids growth pattern of AGP-01 cell line up to 15/20 days of cell culture. AGP-01 cell line was cultivated until day 15/20 in B) $50x10^3$, B) $100x10^3$ and C $150x10^3$ cell lines by scaffold.



RESULTS

Figure 2. Spheroids growth pattern of ACP-02 cell line up to 15/20 days of cell culture. AGP-01 cell line was cultivated until day 15/20 in B) $50x10^3$, B) $100x10^3$ and C $150x10^3$ cell lines by scaffold.

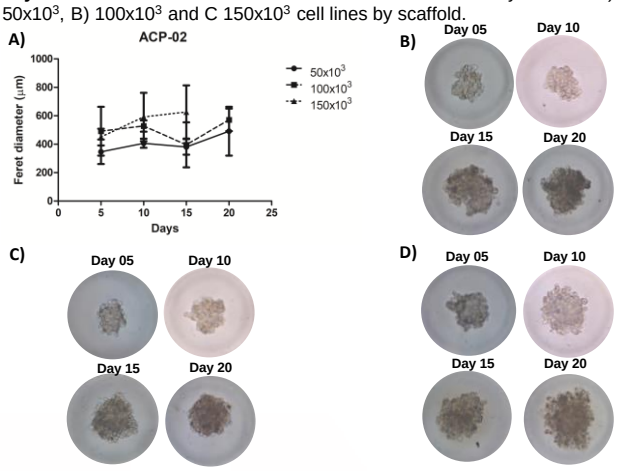


Figure 3. Spheroids growth pattern of ACP-03 cell line up to 15/20 days of cell culture. AGP-01 cell line was cultivated until day 15/20 in B) $50x10^3$, B) $100x10^3$ and C $150x10^3$ cell lines by scaffold.

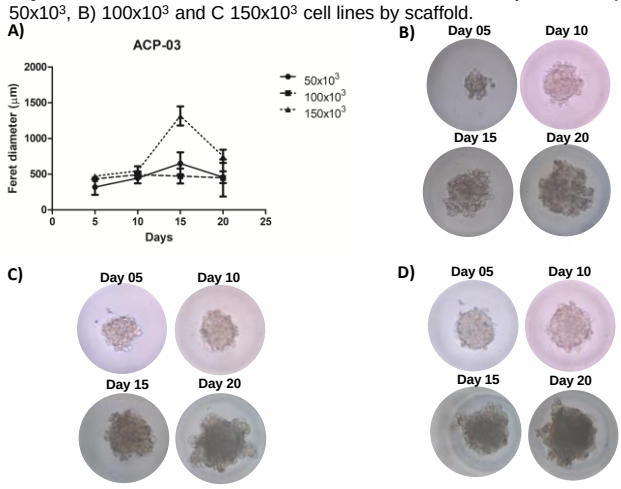
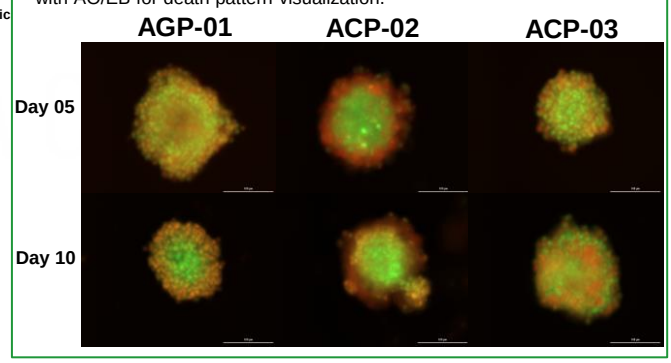


Figure 4. Dual staining with AO/EB after 05 and 07 days of spheroid cultivation. Spheroids of AGP-01, ACP-02, and ACP-03 cell lines were cultivated at $150x10^3$ cell/scaffold and after 5 and 10 days were stained with AO/EB for death pattern visualization.



CONCLUSION

Results evidenced the gastric cancer cell lines maintain regular cell growth in 3D cultivation method, the concentration of $150x10^3$ cells/scallfold and the period of 5-10 days were chosen for further analysis The ACP-03 cell line showed best visual results. However, more experiments should be perfomed to best validate these models in the screening of compounds with antitumor activity for the GC treatment and compare it with 2D models.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians [Internet]. [citado 27 de abril de 2021];n/a(n/a). Disponível em: https://acsjournals.onlinelibrary.wiley.com/doi/abs/10.3322/caac.21660
2. Lv D, Hu Z, Lu L, Lu H, Xu X. Three-dimensional cell culture: A powerful tool in tumor research and drug discovery (Review). Oncology Letters. 1o de dezembro de 2017;14(6):6999–7010.

CONTACT
Silva EL: lucenaemerson@hotmail.com
Valente VMS: vitoriamaurizia@hotmail.com

AKNOWLEDGMENT