

# Celavie Biosciences Adopts Automated Cell Thawing System for their Neural Stem Cell Therapy Program



**Jessica Ochoa**

Research Associate at Celavie Biosciences. She graduated from University of California, Davis and has been in the field for 9 years.

## Introduction

Stem cell therapy is the name of the game at Celavie Biosciences, a small biotech company hoping to make it big on the cellular therapy scene. The privately owned company, which operates out of Oxnard, California, along with its sister company Celavet. Celavet applies proprietary stem cell research techniques toward tissue repair in the field of veterinary medicine.<sup>1</sup> Promising results at both Celavie and Celavet has prompted further development in order to benefit human and equine patients.

Celavie still has fewer than 10 full time employees, but their research thus far<sup>2</sup> has been quite promising. Jessica Ochoa, a research associate at the start up, has been with Celavie from the beginning. Though employees at small companies often have to wear many hats, Ms. Ochoa's area of expertise is Research and Development. Her research centers on the use of human neural tissue derived stem cells to treat neurological conditions such as Parkinson's Disease and ataxia. Ataxia is a general term for neurological disorders where the primary symptoms consist of a lack of voluntary coordination of muscle movements.

## The Importance of Cell Thawing

Ms. Ochoa and her colleagues use both human pluripotent stem cells and equine pluripotent stem cells for their research; cell types known to be fragile and prone to relatively low recovery rates post cryopreservation.<sup>3</sup> Ms. Ochoa considers cell thawing to be a crucial part of her in vitro studies, due to both the low availability of the cell types she works with, and their intrinsic fragility. With only a limited number of vials available, each one is precious.

Prior to acquiring the ThawSTAR® automated cell thawing system, scientists at Celavie were using a 37°C water bath for their cell thawing needs. When thawing cells, they had to constantly check that the vial seals were not compromised by contact with water. Since their samples are so precious, however, this method never sat well with the company. Water baths are prone to contamination, a risk Celavie was not willing to accept. They switched to the ThawSTAR system because it is water-free, eliminating the risk for vial contamination; the fact that the thawing process is automated added to the system's appeal, since it would remove any chance of variability in the thawing technique from operator to operator.

## Evaluating the ThawSTAR® System

Ms. Ochoa told us that when evaluating the new ThawSTAR® system, she was pleasantly surprised.

***"The ThawSTAR® system was small, easy to use, and totally automated. It exceeded my expectations. I was happy with how reliable the results were, and how it eliminated the risk of contamination."***

Ms. Ochoa used the system's confirmation vials to ensure that everything was working properly, then moved quickly on to testing real cell samples. She tested ThawSTAR® in side-by-side trials with the water bath, and found that her cell counts and viability rates were the same or better than the water bath, and that the results were consistent from operator to operator. Workflow also improved with the ThawSTAR integration. Ms. Ochoa described how straightforward the thawing process is;

***"I turn on the ThawSTAR®, prepare my culture flask, and locate the correct vial in our directory. Once the ThawSTAR is warmed up, I remove the vial from liquid nitrogen storage, wipe it down with alcohol, and insert it into the ThawSTAR. A few moments later, the vial pops up; I transport it to the flow hood, transfer the vial contents to the flask, and place it in the incubator for expansion."***

The scientists at Celavie thaw 3-5 vials a week on average. They regularly perform QC testing, checking cell viability at the time of thaw, as well as a few hours later.

## Downstream Impact

Successful and reproducible results in Ms. Ochoa's lab will potentially have an important impact on the cellular therapy industry. Celavie Biosciences has engineered a new type of human fetal brain derived, pluripotent neural stem cell line. These cells have the ability to migrate to the site of damage in a rat neurodegenerative model, and then differentiate in accordance with the type of lesion present. In animal studies, the company has had positive results in the ability of their specialized human stem cell lines to reduce structural and functional deficits in the brain. Celavie hope their research will eventually be used to help regenerate disease-damaged neural tissue for individuals with conditions like Parkinson's.

## Reference

- 1 Watts A. E., et al. Fetal derived embryonic-like stem cells improve healing in a large animal flexor tendonitis model. *Stem Cell Research & Therapy* 2 (4), 1-12. 2011.
- 2 Uppal S. K., et al. Human pluripotent stem cells ameliorate NMDA-induced hippocampal degeneration and related functional deficits. *Cytotherapy*. 16 (4) S61. April 2014.
- 3 Xu Y., et al. Sensitivity of human embryonic stem cells to different conditions during cryopreservation. *Cryobiology*. 71(3): 486-492. Dec 2015.