

<https://3d.nih.gov/entries/3DPX-017520>

The shipping dewar positional cooling device (SDPCD, known as the 'Cajun Ejector') is a 3-D printable device that can assist cryopreservation with various standard cooling rates by use with existing standard shipping dewars. Efforts in development of germplasm repositories to preserve genetic resources of aquatic species are impeded globally by a lack of standardized, inexpensive, reproducible, and portable cryopreservation technologies. The present work demonstrates a 3-D printed standardizable freezing device that can be used with nitrogen vapor shipping dewars for on-site sperm cryopreservation for aquatic species and be distributed as open-hardware. This device could hold 22 French straws (0.25-mL or 0.5-mL) and a quick-release ring design could eject straws directly into a canister inside a dewar by pressing a button after freezing. The final prototypes produced cooling rates of 1 to 68°C/min for 0.25-mL straws, and 3 to 37°C/min for 0.5-mL straws with a material cost of 3.5 USD for a single device

Instructions for (1) assembling and (2) usage are provided as user manuals separately to meet the needs of different users. Details for the development and testing can be found in the publication: Childress, William M., Yue Liu, and Terrence R. Tiersch. "Design, alpha testing, and beta testing of a 3-D printed open-hardware portable cryopreservation device for aquatic species." *Journal of Applied Aquaculture* (2021): 1-24. DOI: 10.1080/10454438.2021.1955805

Please click the 'DOCUMENTATION' tab to download user manuals and video instructions.

The compression spring can be found here:

[https://www.amazon.com/gp/product/B008RG54YG/ref=ewc\\_pr\\_img\\_2?smid=ATVPDKIKX0DER&psc=1](https://www.amazon.com/gp/product/B008RG54YG/ref=ewc_pr_img_2?smid=ATVPDKIKX0DER&psc=1)

Development by the Aquatic Germplasm and Genetic Resources Center (AGGRC) at the Louisiana State University Agricultural Center. Original design by Bill Childress, and colleagues, in partnership with the International Zebrafish Resource Center (ZIRC) and USDA National Animal Germplasm Program (NAGP). This work was funded in part by NIH Office of Research Infrastructure Program (ORIP). This device is part of a multi-year project to develop a series of open hardware to support development of standardized and reproducible tools for the research communities that use aquatic models to study human diseases.

Please visit our website ([aggrc.com](http://aggrc.com)) to learn more about our works.