

SCIENCE SHELL

TYPE-V

Our Bioreactor Type-V ScienceShell

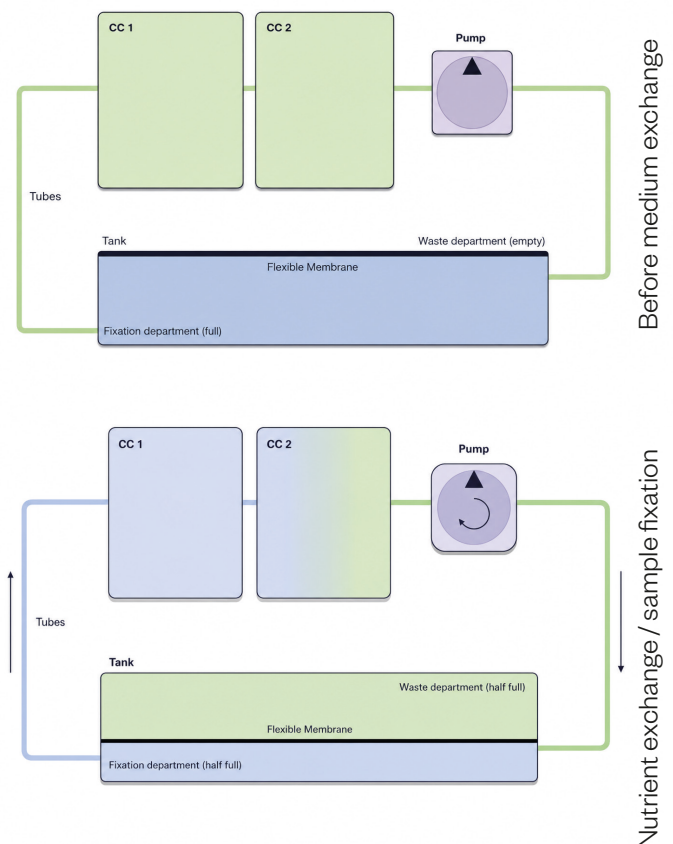
Currently operational on ISS in ScienceTaxi BioSpin

YURI



The **fully automated** Type-V ScienceShell enables experiments which shall either be preserved with fixative or enriched with nutrients in liquid form in a **single cycle of medium exchange**. Type-V consists of a support structure (housing made of PEEK) which includes two Culture Chambers (CCs), the pumping and canal system connecting to a **spacious tank** produced from an aluminium alloy enabling controlled fluid transfer. Each chamber can be sealed with polycarbonate windows, which can **optionally be equipped with LEDs** to provide tailored illumination according to specific scientific requirements. The medium exchange cycles and LED illumination are automatically controlled through the ScienceShell's onboard electronics and programmable schedule, ensuring fully autonomous operation during experiments in space or on Earth.

- Compatible OuterShell: 348
- Automation Level: Fully Autonomous
Operation Type: Active
- LoC: 3** ; 1 (InnerShell) + 2 (OuterShell)
- Maturity: Spaceflight Proven (**TRL 9**)
- Missions flew: Simbox, Cellbox-2, Cellbox-3, HUMB, Cellbox-45 (launch in 2026), **Last mission: HUMB**
- Material of CC and Tank: PEEK, Aluminium Alloy
Manufacturing Process: Machined, Assembled by Yuri
- Number of CCs: 2
Number of Tanks: 1
- Volume of CC: 10.8 ± 0.3 ml each
Volume of Tanks: 20 ± 0.5 ml
- Medium Exchange:**
By: Yuri Fluidic Pumping System
No. of exchanges: 1 (Nutrient / Fixative)
Duration of exchange: 7 Minutes
- Qualified Fixatives: Paraformaldehyde, RNAlater, Notoxhisto
- Compatibility of Facility: **ScienceTaxi Haven-1, ScienceTaxi BioSpin, SABL, Kubik**, through ScienceBox (TangoLab & ICE Cubes)
- Advanced accessories: LEDs
- Already flown biological material/cells: Rice Callus Cultures, Arabidopsis cell cultures, Caenorhabditis elegans, Haematococcus pluvialis, Euglena gracilis, Arabidopsis thaliana seedlings (wild type and gravity insensitive mutant), Human bone marrow spheroids, Flying in Cellbox-45 in 2026: Peripheral blood mononuclear cells from human donors



For any additional information regarding other fixatives and suitable biological material please contact Yuri.