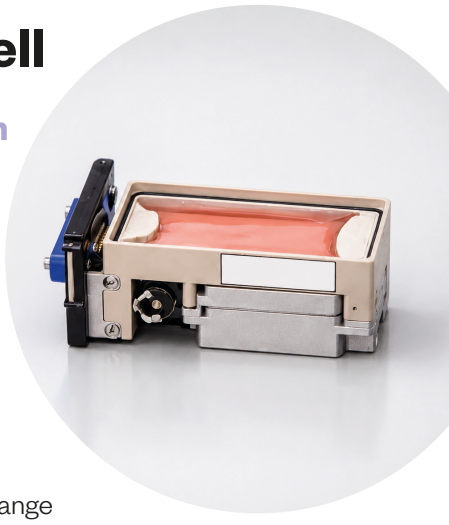
SCIENCE SHELL

TYPE-IV

YURI

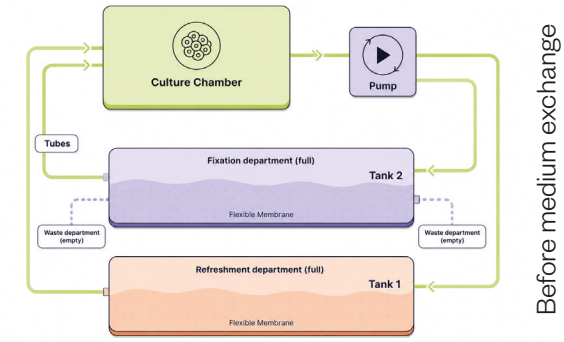
Our Bioreactor Type-IV ScienceShell

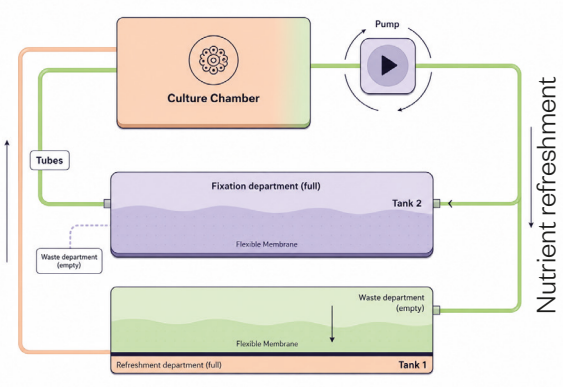
Currently operational on ISS in ScienceTaxi BioSpin

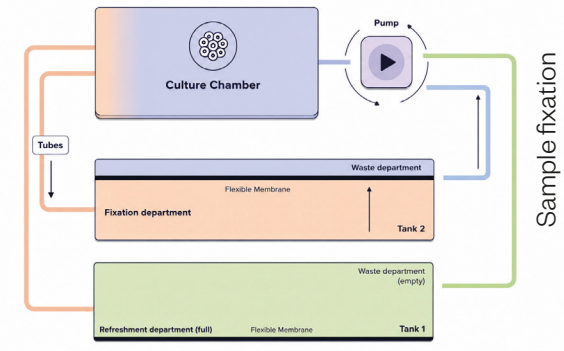


The **fully automated** Type-IV ScienceShell is designed to support sophisticated cell culture experiments in microgravity. It provides a single, self-contained Culture Chamber (CC) that maintains cells in a liquid medium while enabling automated **nutrient exchange and sample fixation**. Two integrated tanks can be filled with any desired fluids, which are automatically pumped into the Culture Chamber according to the experimental schedule. 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,
  Manufacturing Process: Machined, Assembled by Yuri
- Number of CCs: 1
  Number of Tanks: 2
- Volume of CC: 13.5 ± 0.3 ml
  Volume of Tanks: 11 ± 0.3 ml each
- **Medium Exchange:**
  By: Yuri Fluidic Pumping System
  No. of exchanges: 2 (1 Nutrient, 1 Fixative)
  Duration of exchange: 4 Minutes each
- Qualified Fixatives: Paraformaldehyde(PFA), RNAlater, Notoxhisto
- Compatibility of Facility: **ScienceTaxi Haven-1**, **ScienceTaxi BioSpin**, SABL, Kubik, through ScienceBox (TangoLab & ICE Cubes)
- Advanced accessories: LEDs, microscopic slides/custom-insert in CC
- Already flown biological material/cells: Human Thyroid Cancer Cells, Human Neuroglioma Cells (SH-SY5Y), Murine skeletal muscle cells and motoneurons, Flying in Cellbox-45 in 2026: Spheroids from human pancreas progenitor cells & from human prostate cancer cell line, Organoids from human neuromesodermal progenitors and Schwann cell precursors, from human hippocampus and from human liver and intestine cells, Human mesenchymal stem cells and hematopoietic stem cells







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

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