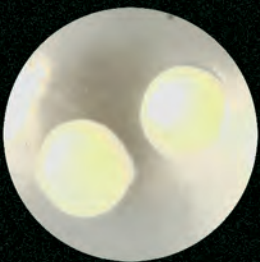
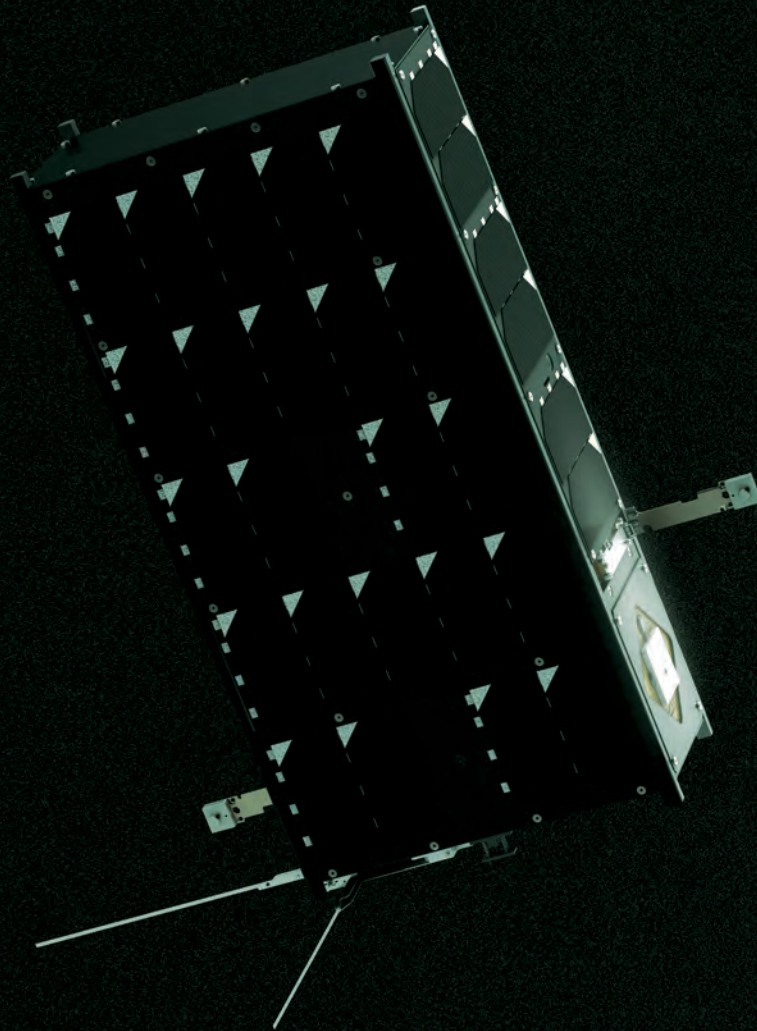


8U BIO PLATFORM

An advanced CubeSat platform for space medicine and biotechnology research, providing a stable microgravity environment, precise thermal management, high power capacity and adaptable interfaces for a wide range of biological payloads



BioCabinet experiment, developed by Hallym University under the leadership of Chan Hum Park, was operated aboard the CAS500-3 satellite on a Kairospace 8U platform.

The mission successfully demonstrated biological experiments in microgravity, including magnetic stimulation and differentiation of cells, as well as 3D bioprinting using magnetic bioinks.

KAIROSPACE

BIO-PAYLOAD 8U PLATFORM

An 8U CubeSat platform designed for biological and life-science experiments, offering a stable, controlled environment in space. It features high power capacity, precise thermal control, and flexible interfaces for sensitive payloads like cell cultures, microfluidics, and biosensors. Its modular design supports easy integration and standard launch compatibility, enabling reliable and flexible microgravity research in space medicine and biotechnology.

CubeSat form factor: 8U

Platform composition: Structure, OBC, PCPU, MPPT, battery, six solar panels, UHF transceiver, S-band transceiver, UHF patch antenna, S-band patch antenna

Mass / 4 kg without payload
Dimensions / 226.3 x 100 x 454 mm

Average power / 20W
Peak power / 60W
Battery capacity / 96Wh
available configuration: 4S, 2S2P, 4P
Bus Voltage / 3.3V, 5V, 12V, Battery raw

ADCS

Pointing Knowledge / $<5^\circ$ (1σ)
Pointing Accuracy / $<10^\circ$ (1σ)
GPS Accuracy (optional) / PPS accuracy 20 ns
Position accuracy / 12 m (3σ)
Velocity accuracy / 0.9 m/s (3σ)
Slew Rate (2.5mNms reaction wheel assembly) / 5.15 deg/s on each axis / 5.5 deg/s simultaneous on all three axes

OS / Real time OS - FreeRTOS
Encryption / AES-256-GCM/CBC (On-board)
Design Life / 1 year (no propulsion)

Communication (UHF)

Mod. FM, AFSK, FSK, J/B
Uplink VHF (1200 bps AFSK) / Downlink UHF (9600 bps GMSK)
Uplink UHF (1200 bps AFSK) / Downlink VHF (1200 bps AFSK)
AX.25 Protocol (Custom Protocol available)
Transmission Power: Max. 2W
Beacon: UHF (20 WPM @ 500 mW)

Communication (S-Band)

Mod. BPSK / QPSK / OQPSK (High efficiency)

Frequencies:
Uplink: 2025–2110 MHz (S-band)
Downlink: 2200–2290 MHz (S-band)

Data rates:
Uplink: 32 kbps to 256 kbps (Typical)
Downlink: 1 Mbps to 5 Mbps (Standard) / Up to 10 Mbps (High Speed)

Protocol: CCSDS (Consultative Committee for Space Data Systems) / Custom AX.25 Encapsulation

Transmission Power: Adjustable 0.5W to 2W (Max 4W peak for 8U thermal limits)

Antenna System: Patch Antenna (Directional) or Quadrifilar helix (Broadbeam)

Price range: 250K - 1.5M USD

with flight software: 410K - 2.15M USD

Biological Payload

Mass / Up to 12 kg
Envelope / Up to 4U (configurable) + tunacan (depending on dispenser)
Power for payload (peak) / 15 W

Payload Interface
Data: I2C/CAN/SPI/UART
TMTC: UHF, S-BAND
Power / 3.3V, 5V, 12V, Battery raw
Payload Data Transmission / S-band
Data Storage / up to 32 GB

