**1. Using Paramecium (Pantoffeltierchen):**

* **Pros:**
  + Very **easy to grow** in large numbers (tap water + hay = culture).
  + **Big enough** (~200–300 µm) to see under a cheap microscope.
  + **Sensitive** to cold, low pressure, and radiation — **most will die**, allowing study of **damage and survival rates**.
  + **Simple to handle** and needs only a water droplet for observation.
* **Cons:**
  + **Fragile**: will **mostly die** when frozen and exposed to high radiation.
  + Single-cell organism: **no complex structures** to study (only membrane, nucleus).

**2. Using Tardigrades (Water Bears):**

* **Pros:**
  + **Extremely tough**: can survive freezing to -272°C, vacuum, high radiation, dehydration, and even space exposure.
  + **Bigger** (~300–1200 µm), easy to spot and film under low magnification.
  + **Complex animals**: you can study organs, muscle movements, even behavior after flight.
  + **Can go into "tun state"**: when dried out or frozen, they curl up and shut down metabolism to survive extreme environments.
* **Cons:**
  + **Harder to find and culture**: need to collect them from moss, lichens, or soil samples.
  + **More resistant**: may show **less visible damage**, so survival studies are less dramatic unless you push them really hard (high radiation, dehydration + freezing combined).

**3. How They Survive High-Altitude Conditions:**

| **Condition** | **Paramecium** | **Tardigrade** |
| --- | --- | --- |
| Freezing | Most will die from ice crystal damage | Will survive by going into "tun state" |
| Low Pressure | Stress and dehydration, likely lethal | Survive easily |
| UV Radiation | Causes DNA damage, usually fatal | Some survive even intense radiation |
| Thawing | Many cells rupture after freezing | Tardigrades can wake up and move again |

**4. How Easy Are They to Get?**

* **Paramecium**:
  + Super easy: Buy a culture online or even grow your own using pond water + old hay or lettuce water.
  + Cheap and fast (days to grow a lot).
* **Tardigrades**:
  + A little harder:
    - Collect moss, wet it, and squeeze the water out.
    - Search through droplets under a microscope to find them.
  + Takes more time and patience (and luck), but you can absolutely find them yourself almost anywhere in the world!
  + Also possible to buy cultures online, but usually more expensive than Paramecium.

**5. Which Should We Use?**

* **If the goal is to study death, damage, and extreme environment effects visibly:**  
  → **Use Paramecium.**
  + Easier, cheaper, dramatic results (most will die and show clear cell damage).
* **If the goal is to study survival, resilience, and revival after extreme exposure:**  
  → **Use Tardigrades.**
  + More challenging, but much cooler if you can catch one surviving and waking up after a flight!

Note: you can buy tardigrades for about 17 euros.