Sodium-23 (²³Na)

Sodium-23 (²³Na) is the only stable and naturally occurring isotope of the chemical element sodium (Na).

 Key Properties: Atomic number: 11

Mass number: 23

Spin: 3/2 (quadrupolar nucleus, which influences MRI signal behavior)

Natural abundance: 100% of all sodium in the human body is ²³Na.

 Medical Relevance: ²³Na is biologically essential, playing a critical role in:

Maintaining osmotic balance

Cell membrane potential

Neuronal signaling

Muscle contraction

In MRI, ²³Na nuclei can be detected using sodium MRI (²³Na-MRI), allowing the assessment of tissue sodium concentration (TSC), which is linked to cell viability, edema, and tumor physiology.

 Summary: Sodium-23 is the MRI-detectable isotope of sodium that serves as a window into the cellular microenvironment, particularly useful in research and emerging clinical imaging techniques like ²³Na-MRI.