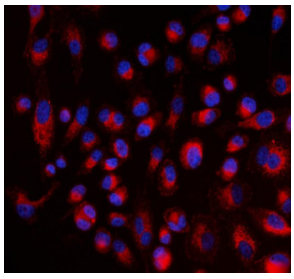
# ALDH1A2 Antibody / Retinal dehydrogenase 2 (R32466)

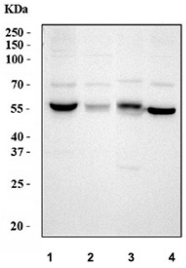
| Catalog No. | Formulation | Size |
|---|---|---|
| R32466 | 0.5mg/ml if reconstituted with 0.2ml sterile DI water | 100 ug |

**Bulk quote request**

| | |
|---|---|
| **Availability** | 1-3 business days |
| **Species Reactivity** | Human, Monkey |
| **Format** | Antigen affinity purified |
| **Host** | Rabbit |
| **Clonality** | Polyclonal (rabbit origin) |
| **Isotype** | Rabbit IgG |
| **Purity** | Antigen affinity |
| **Buffer** | Lyophilized from 1X PBS with 2% Trehalose |
| **UniProt** | O94788 |
| **Applications** | Western Blot : 0.5-1ug/ml<br>Immunofluorescence : 5ug/ml |
| **Limitations** | This ALDH1A2 antibody is available for research use only. |



Immunofluorescent staining of FFPE human PC-3 cells with ALDH1A2 antibody (red) and DAPI nuclear stain (blue). HIER: steam section in pH6 citrate buffer for 20 min.




Western blot testing of 1) human K562, 2) human 293T, 3) monkey kidney and 4) human A549 cell lysate with ALDH1A2 antibody. Predicted molecular weight ~56 kDa.

## Description

ALDH1A2 antibody recognizes Retinal dehydrogenase 2, a cytosolic enzyme encoded by the ALDH1A2 gene on chromosome 15q21.3. This enzyme belongs to the aldehyde dehydrogenase family and catalyzes the oxidation of retinaldehyde to retinoic acid, a critical signaling molecule in embryogenesis, tissue differentiation, and metabolic regulation. ALDH1A2 is highly expressed in developing mesoderm, somites, neural tube regions, heart, lung, and selected adult tissues including liver, kidney, and reproductive organs. Its spatially regulated production of retinoic acid helps establish anterior-posterior patterning, organogenesis, and signaling gradients required for early developmental processes. The protein localizes to the cytoplasm and cytosolic enzyme complexes that co-localize with retinoid-binding proteins and components of retinoic acid biosynthetic pathways.

Retinal dehydrogenase 2 functions as a rate-limiting enzyme in the retinoic acid synthesis pathway. By converting retinaldehyde to biologically active retinoic acid, ALDH1A2 influences a wide range of developmental and postnatal signaling cascades, including differentiation of cardiac precursors, limb patterning, neural crest development, and epithelial-to-mesenchymal transitions. In adult tissues, ALDH1A2 supports metabolic roles in retinoid homeostasis, immune regulation, and cellular stress responses. Its activity is essential for maintaining appropriate levels of retinoic acid in physiological niches that support tissue maintenance and regeneration. Enzyme function is modulated by substrate availability, cofactor binding, protein-protein interactions, and post-translational modifications affecting catalytic efficiency.

Mutations or altered expression of ALDH1A2 are associated with several developmental disorders and disease contexts. Disrupted ALDH1A2 activity contributes to congenital heart defects, craniofacial abnormalities, and limb malformations due to impaired retinoic acid gradients during embryonic development. Reduced expression has been reported in inflammatory and metabolic disorders, where retinoic acid deficiency affects immune tolerance and tissue remodeling. Conversely, in some cancers, ALDH family members including ALDH1A2 have been studied for their roles in cell differentiation, retinoid metabolism, and stem-like cell states. Isoform diversity arises from alternative transcriptional and splicing mechanisms that can influence enzymatic activity, tissue distribution, and postnatal expression patterns.

Subcellular localization studies place ALDH1A2 primarily in the cytosol, with partial co-localization to retinoid metabolic hubs and intracellular structures involved in redox homeostasis. During embryogenesis, ALDH1A2 expression is tightly regulated in developing somites and cardiac progenitor fields, where its retinoic acid production shapes tissue patterning. In adult tissues, expression increases in metabolically active environments and in selected immune cell subsets that utilize retinoic acid for regulatory signaling.

This ALDH1A2 antibody is suitable for detecting Retinal dehydrogenase 2 in research focused on retinoic acid biosynthesis, embryonic development, cardiac and neural patterning, immune regulation, metabolic homeostasis, and disease models involving altered retinoid signaling. NSJ Bioreagents includes this reagent within its metabolism and developmental biology antibody portfolio.

## Application Notes

Optimal dilution of the ALDH1A2 antibody should be determined by the researcher.

## Immunogen

Amino acids M1-A110 from the human protein were used as the immunogen for the ALDH1A2 antibody.

## Storage

Prior to reconstitution, store at 4oC. After reconstitution, the ALDH1A2 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.