



GART (h): 293T Lysate: sc-115506

BACKGROUND

Purines are critical for energy metabolism, cell signaling and cell reproduction and also function as precursors for coenzymes, energy transfer molecules, regulatory factors and proteins involved in RNA and DNA synthesis. GART (GAR transformylase), also referred to as AIRS, GARS, PAIS, PGFT, PRGS or GARTF, is 1,010 amino acids in length and is a key folate dependent trifunctional enzyme with phosphoribosylglycinamide formyltransferase, phosphoribosylglycinamide synthetase and AICAR (phosphoribosylaminoimidazole synthetase) activity required for *de novo* purine biosynthesis. Cancer cells require considerable amounts of purines to sustain their accelerated growth and GART is, therefore, a target for cancer chemotherapy. GART is highly conserved in vertebrates. Two isoforms of GART are expressed due to alternative splicing events.

REFERENCES

1. Smith, G.K., Mueller, W.T., Slieker, L.J., DeBrosse, C.W. and Benkovic, S.J. 1982. Direct transfer of one-carbon units in the transformylations of *de novo* purine biosynthesis. *Biochemistry* 21: 2870-2874.
2. Deacon, R., Chanarin, I., Lumb, M. and Perry, J. 1985. Role of folate dependent transformylases in synthesis of purine in bone marrow of man and in bone marrow and liver of rats. *J. Clin. Pathol.* 38: 1349-1352.
3. Daubner, S.C., Young, M., Sammons, R.D., Courtney, L.F. and Benkovic, S.J. 1986. Structural and mechanistic studies on the HeLa and chicken liver proteins that catalyze glycinamide ribonucleotide synthesis and formylation and aminoimidazole ribonucleotide synthesis. *Biochemistry* 25: 2951-2957.
4. Brodsky, G., Barnes, T., Bleskan, J., Becker, L., Cox, M. and Patterson, D. 1997. The human GARS-AIRS-GART gene encodes two proteins which are differentially expressed during human brain development and temporally overexpressed in cerebellum of individuals with Down syndrome. *Hum. Mol. Genet.* 6: 2043-2050.
5. Nixon, A.E., Warren, M.S. and Benkovic, S.J. 1997. Assembly of an active enzyme by the linkage of two protein modules. *Proc. Natl. Acad. Sci. USA* 94: 1069-1073.
6. Poch, M.T., Qin, W. and Caperelli, C.A. 1998. The human trifunctional enzyme of *de novo* purine biosynthesis: heterologous expression, purification, and preliminary characterization. *Protein Expr. Purif.* 12: 17-24.
7. Liu, C., Shim, J.H. and Benkovic, S.J. 2000. The unexpected catalytic properties of a heterodimer of GAR transformylase. *Bioorg. Chem.* 28: 316-323.
8. Boger, D.L., Marsilje, T.H., Castro, R.A., Hedrick, M.P., Jin, Q., Baker, S.J., Shim, J.H. and Benkovic, S.J. 2000. Design, synthesis, and biological evaluation of fluoronitrophenyl substituted folate analogues as potential inhibitors of GAR transformylase and AICAR transformylase. *Bioorg. Med. Chem. Lett.* 10: 1471-1475.
9. Dahms, T.E., Sainz, G., Giroux, E.L., Caperelli, C.A. and Smith, J.L. 2005. The apo and ternary complex structures of a chemotherapeutic target: human glycinamide ribonucleotide transformylase. *Biochemistry* 44: 9841-9850.

CHROMOSOMAL LOCATION

Genetic locus: GART (human) mapping to 21q22.11.

PRODUCT

GART (h): 293T Lysate represents a lysate of human GART transfected 293T cells and is provided as 100 µg protein in 200 µl SDS-PAGE buffer.

APPLICATIONS

GART (h): 293T Lysate is suitable as a Western Blotting positive control for human reactive GART antibodies. Recommended use: 10-20 µl per lane.

Control 293T Lysate: sc-117752 is available as a Western Blotting negative control lysate derived from non-transfected 293T cells.

STORAGE

Store at -20° C. Repeated freezing and thawing should be minimized. Sample vial should be boiled once prior to use. Non-hazardous. No MSDS required.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.