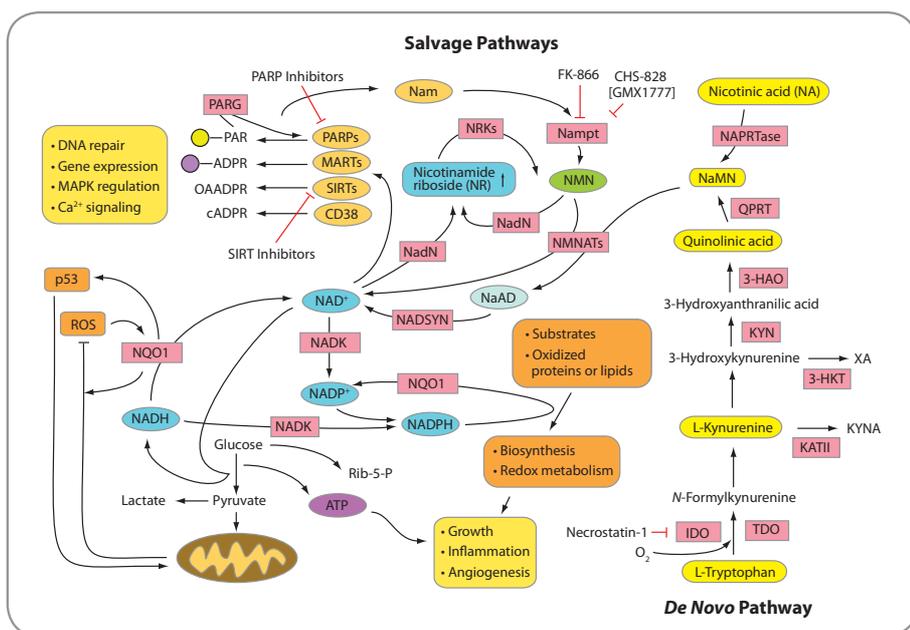


NAD⁺ Metabolome

NAD⁺ – From De Novo to Salvage Pathways



Tryptophan (Trp) is an essential amino acid that cannot be synthesized by the organism and therefore must be part of our diet. It acts as building block in protein biosynthesis and is the only precursor for the endogenous *de novo* biosynthesis of nicotinamide adenine dinucleotide (NAD⁺). The first, rate-limiting step in the biosynthesis of NAD⁺ is the conversion of tryptophan to N-formylkynurenine, catalyzed by two enzymes, either indoleamine 2,3-dioxygenase (IDO) or tryptophan 2,3-dioxygenase (TDO), both requiring molecular oxygen.

NAD⁺ and its phosphorylated and reduced forms (NADP⁺, NADH and NADPH) have central roles in cellular metabolism, energy production. NAD⁺-dependent protein deacetylases, poly(ADP-ribose) polymerases and transcription factors affect a large array of cellular functions.

LITERATURE REFERENCES: The Secret Life of NAD⁺: An Old Metabolite Controlling New Metabolic Signaling Pathways: R.H. Houtkooper, et al.; *Endocr. Rev.* 31, 194 (2010) • The NAD metabolome—a key determinant of cancer cell biology: A. Chiarugi, et al.; *Nat. Rev. Cancer* 12, 741 (2012)

Newly Released Enzymes of the NAD⁺ Biosynthesis Pathways

| PID | PRODUCT NAME | SIZE | SOURCE | PURITY (SDS-PAGE) | BIOLOGICAL ACTIVITY |
|-------------|---|-------|---------|-------------------|--|
| AG-40T-0100 |  3-Hydroxykynurenine Transaminase (<i>Anopheles gambiae</i>) (rec.) | 50 µg | E. coli | ≥99% | 33 µmol/min/mg protein |
| AG-40T-0101 |  TDO (<i>Anopheles gambiae</i>) (rec.) (His) | 50 µg | E. coli | ≥98% | 87.0 µmol/hr/mg protein |
| AG-40T-0102 | Kynurenine Aminotransferase II (human) (rec.) (His) | 50 µg | E. coli | ≥97% | N/A |
| AG-40T-0104 |  NAPRTase (<i>B. subtilis</i>) (rec.) | 50 µg | E. coli | ≥98% | ~0.8 U/mg protein |
| AG-40T-0105 | NAPRTase (human) (rec.) (His) | 50 µg | E. coli | ≥98% | ~0.27 U/mg protein |
| AG-40T-0106 |  NAD Kinase (<i>B. subtilis</i>) (rec.) | 50 µg | E. coli | ≥98% | ~2.6 U/mg protein |
| AG-40T-0107 |  NAD Kinase (<i>M. tuberculosis</i>) (rec.) (His) | 50 µg | E. coli | ≥98% | ~1.2 U/mg protein ¹ ~3.8 U/mg protein ² |
| AG-40T-0108 |  NAD Synthetase (<i>M. tuberculosis</i>) (rec.) (His) | 50 µg | E. coli | ≥98% | ~0.1 U/mg protein |
| AG-40T-0109 |  NAD Synthetase (<i>B. subtilis</i>) (rec.) | 50 µg | E. coli | ≥98% | ~0.3 U/mg protein |



For anti-Malaria Research



Robust and economic enzymes to produce end products

¹ Substrate: NAD⁺ + (ATP)

² Substrate: NAD⁺ + poly(P)

Visit our website www.adipogen.com for a comprehensive product and size overview!

www.adipogen.com

NAD Nucleotidase – An economic way to Nicotinamide Riboside

Nicotinamide riboside (NR) enhances levels of mitochondrial NAD⁺. It was shown to have unique and beneficial properties in neuroprotection, sirtuin activation, protection against weight gain on high fat diet and improvement of blood glucose and insulin sensitivity. NAD nucleotidase plays a central role by degrading NAD⁺ into adenosine and NR, nicotinamide mononucleotide (NMN) to nicotinamide riboside and AMP to adenosine. It can be used as an economically alternative to produce NR.

LIT: The NAD(+) precursor nicotinamide riboside enhances oxidative metabolism and protects against high-fat diet-induced obesity: C. Cantó, et al.; Cell Metab. 15, 838 (2012)

| PID | PRODUCT NAME | SIZE | SOURCE | PURITY (SDS-PAGE) | BIOLOGICAL ACTIVITY |
|-------------|---|-------|---------|-------------------|--|
| AG-40T-0110 | NAD Nucleotidase (<i>H. influenzae</i>) (rec.) | 50 µg | E. coli | ≥98% | With NMN: 110.3 nmol of NR/min/mg of protein |

Biologically Active IDO and TDO

The tryptophan catabolism is a key factor in the immunobiology of cancer that suppresses antitumor immune responses. It has been proposed that the essential amino acid tryptophan is catabolized in tumor tissue by the rate-limiting enzymes indoleamine-2,3-dioxygenase (IDO) and tryptophan-2,3-dioxygenase (TDO) expressed in tumor cells or antigen-presenting cells. This metabolic pathway creates an immunosuppressive milieu in tumors and in tumor-draining lymph nodes by inducing T cell anergy and apoptosis through depletion of tryptophan and accumulation of immunosuppressive tryptophan catabolites.

| PID | PRODUCT NAME | SIZE | SOURCE | PURITY (SDS-PAGE) | BIOLOGICAL ACTIVITY |
|-------------|---|---------------|---------|-------------------|----------------------|
| AG-40A-0028 | IDO (human) (rec.) (His) | 50 µg | E. coli | ≥90% | >100'000U/mg protein |
| AG-40A-0030 | IDO (mouse) (rec.) (His) | 50 µg | E. coli | ≥90% | >100'000U/mg protein |
| AG-40A-0193 | TDO (human) (rec.) (His) | 10 µg 50 µg | E. coli | ≥90% | Highly Active! |
| AG-40A-0151 | TDO (heme-free) (human) (rec.) (His) | 10 µg 50 µg | E. coli | ≥90% | Control! |

Specific IDO and TDO Antibodies

| PID | PRODUCT NAME | SIZE | SOURCE/ ISOTYPE | APPLICATION | SPECIES |
|--------------|---------------------------------------|----------------|-----------------|----------------------|---------|
| AG-20A-0035 | anti-IDO (human), mAb (ID 177) | 50 µg 100 µg | Ms IgG1κ | ELISA, WB | Hu |
| AG-25A-0029 | anti-IDO (human), pAb | 100 µg | Rb | ELISA, FACS, ICC, WB | Hu |
| AG-25A-0029R | anti-IDO (human), pAb (R-PE) | 50 µg | Rb | ELISA, FACS, ICC, WB | Hu |
| AG-25A-0032 | anti-IDO (mouse), pAb | 100 µg | Rb | ELISA, ICC, IHC, WB | Ms |
| AG-25A-0106 | anti-TDO (human), pAb | 100 µg | Rb | ELISA, WB | Hu |

IDO Inhibitor

Necrostatin-1

AG-CR1-2900-M005
AG-CR1-2900-M025

5 mg
25 mg

Formula: C₁₃H₁₃N₃O₃
MW: 259.3
CAS: 4311-88-0

