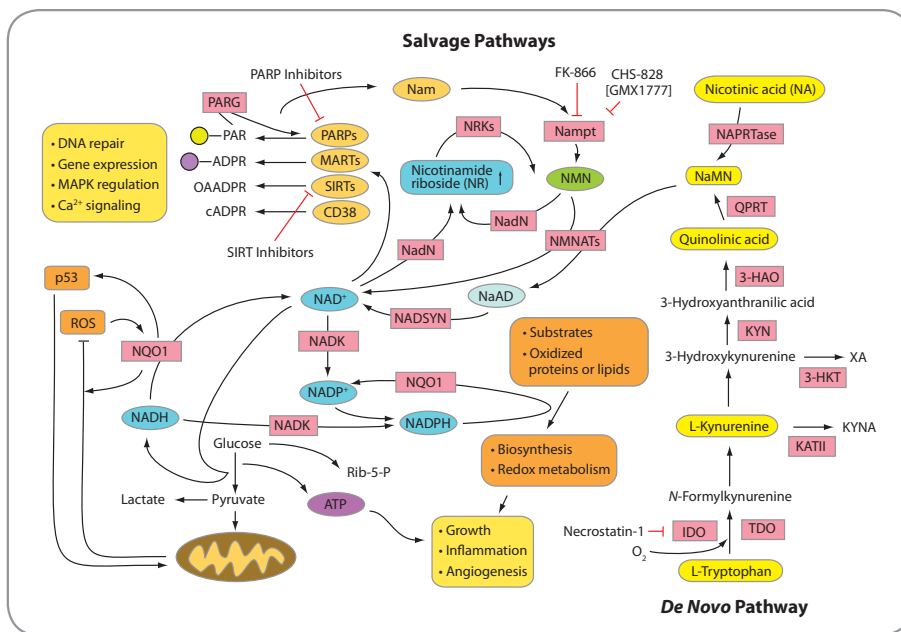


NAD⁺ Metabolome

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

