DYRK Inhibitors, Product Flyer

Interest in any of the products, request or order them at Bio-Connect.
DYRK Inhibitors

DYRK (dual-specificity tyrosine-regulated kinase) family members constitute an evolutionarily conserved family of protein kinases that have been identified in different organisms such as yeast, Drosophila and human.

Seven mammalian DYRK-related kinases have been identified: DYRK1A, DYRK1B, DYRK1C, DYRK2, DYRK3, DYRK4A and DYRK4B. The DYRK proteins are dual-specificity protein kinases that autophosphorylate a conserved tyrosine (Y) residue in their own activation loop but phosphorylate their substrates at serine (S) or threonine (T) residues. The Y autophosphorylation occurs during translation and induces kinase activation; however, once the protein is fully translated, kinase activity becomes restricted to S and T residues and no longer depends on Y phosphorylation.

An increasing number of substrates involved in signal transduction pathways is being reported for DYRKs. These substrates of DYRKs have diverse effects such as enhancement of transcription factor activity, modulation of subcellular protein distribution and regulation of enzyme activity. Some DYRKs also control protein stability by inducing the proteasome system or by stabilizing short-lived proteins. One characteristic feature of several DYRK kinases is their function as priming kinases, meaning that the phosphorylation of a given residue by a DYRK is a prerequisite for the subsequent phosphorylation of a different residue by another protein kinase (GSK3 or PLK). Phosphorylation by protein kinases is the most universally used mechanism by cells to control their structural proteins and enzymes. All major physiological phenomena are regulated by phosphorylation and many diseases are associated with abnormal phosphorylation. Therefore, the search for pharmacological inhibitors has become a major area of research for the discovery and development of new therapies.

DYRK1A (‘dual specificity, tyrosine phosphorylation regulated kinase 1A’) is the most extensively studied among this family of kinases because its gene maps to human chromosome 21 within the Down syndrome critical region (DSCR) and may play a significant role in developmental brain defects, early neurodegeneration and cancer susceptibility of individuals with this syndrome. Recent studies have shown that abnormalities in DYRK1A dosage are associated with cognitive disorders observed in Down Syndrome: A. Duchon & Y. Herault; Front. Behav. Neurosci. 10, 104 (2016) • Novel factors modulating human β-cell proliferation: J. Shirakawa & R.N. Kulkarni; Diabetes Obes. Metab. 18, 71 (2016)
β-Carbol ine Class DYRK1A Inhibitors

**Harmine**

Formula: C_{13}H_{12}N_{2}O | MW: 212.3 | CAS: 442-51-3
DYRK Activity: DYRK1A | DYRK2 | DYRK3 (IC_{50}=0.08 | 0.9 | 0.8μM)
Other Kinase Activity: CLK2, PIM3, CK1, MAO-A

**NEW**

**DYRK1A/B Inhibitor AnnH31**

Formula: C_{19}H_{17}N_{3}O | MW: 271.7
DYRK Activity: DYRK1A (IC_{50}=81nM) | DYRK1B
Other Kinase Activity: CLK1, CLK4, Haspin/GSG2

**NEW**

**DYRK1A/B Inhibitor AnnH75**

Formula: C_{19}H_{13}ClN_{2}O | MW: 277.3
DYRK Activity: DYRK1A (IC_{50}=181nM) | DYRK1B
Other Kinase Activity: CLK1, CLK2, CLK4

**Control Compound:**

**DYRK1 Inhibitor Negative Control AnnH79**

Formula: C_{13}H_{15}O_{2}N_{2}S | MW: 295.3
DYRK Activity: DYRK1A | DYRK1B

**INDY Class DYRK Inhibitors**

**INDY**

Formula: C_{19}H_{15}NO_{2}S | MW: 300.801-52-9
DYRK Activity: DYRK1A | DYRK1B
Other Kinase Activity: CLK1, CLK2, CLK4

**TG003**

Formula: C_{13}H_{19}NO_{2}S | MW: 277.3 | CAS: 719277-30-2
DYRK Activity: DYRK1A | DYRK1B

**TG007 [ProINDY]**

Formula: C_{19}H_{13}NO_{2}S | MW: 249.3 | CAS: 300801-52-9
DYRK Activity: DYRK1A | DYRK1B

**NEW**

**FINDY**

Formula: C_{13}H_{19}NO_{2}S_{2}Si | MW: 347.5 | CAS: 1507367-37-4
DYRK Activity: Suppressor of DYKR1A intramolecular Ser^{97}-autophosphorylation.
Other Kinase Activity: GSK3β, MARK4, PIM1, PIM3, PLK3
**TBI (Tetrabromo-benzimidazole) Derivatives & Analogs**

**TBB**  
*AG-CR1-3660*  
**Formula:** C₆HBr₄N₃  
**MW:** 434.7  
**CAS:** 17374-26-4  
**DYRK Activity:** DYRK1A (IC₅₀=4.4μM)  
**Other Kinase Activity:** CK2, CCK2/cyclin A, GSK3β  

**DMAT**  
*AG-CR1-3654*  
**Formula:** C₅H₂Br₃N₃  
**MW:** 476.8  
**CAS:** 749234-11-5  
**DYRK Activity:** DYRK1A (IC₅₀=0.4μM) | DYRK2 (IC₅₀=0.4μM)  
**Other Kinase Activity:** CK2, PIM1, PIM3, HIPK2, HIPK3, PKD1, CDK2  

**Other DYRK1A Inhibitors**

**(-)-Epigallocatechin gallate [EGCG]**  
*AG-CN2-0063*  
**Formula:** C₁₈H₁₄O₇  
**MW:** 348.4  
**CAS:** 989-51-5  
**DYRK Activity:** DYRK1A (IC₅₀=330nM)  
**Other Kinase Activity:** PRAK  

**Purvalanol A**  
*AG-CR1-2903*  
**Formula:** C₁₉H₂₀ClN₅O  
**MW:** 388.9  
**CAS:** 1084893-56-0  
**DYRK Activity:** DYRK1A (IC₅₀=300nM)  
**Other Kinase Activity:** CDK1, CDK2/cyclin A, Cdc2/cyclin B, CDK2/cyclin E, CDK4/cyclin D1, CDK5/p35  
**Lit:** K. Bettayeb, et al.; Oncogene 27, 5797 (2008)

**(S)-CR8**  
*AG-MR-C0004*  
**Formula:** C₁₆H₂₂N₆O₅  
**MW:** 388.9  
**CAS:** 1084893-56-0  
**DYRK Activity:** DYRK1A (IC₅₀=2.8 μM)  
**Other Kinase Activity:** CDK1, CDK2, CDK5, CDK9, CK1δ/ε  
**Lit:** K. Bettayeb, et al.; Oncogene 27, 5797 (2008)

**UNIQUE (S)-Perharidine 1**  
*AG-MR-C0012*  
**Formula:** C₁₆H₂₆N₆O₅  
**MW:** 431.5  
**CAS:** 1133437-81-6  
**DYRK Activity:** DYRK1A (IC₅₀=2.8 μM)  
**Other Kinase Activity:** CDK1, CDK2, CDK5, CDK9, CK1δ/ε  

**NU6102**  
*AG-CR1-0020*  
**Formula:** C₁₉H₁₉N₆O₅S  
**MW:** 402.5  
**CAS:** 1347164-57-0  
**DYRK Activity:** DYRK1A (IC₅₀=2.8 μM)  
**Other Kinase Activity:** CDK1, CDK2, CDK4, PDK1, ROCK-II  

**SMI-16a**  
*CDX-P0110*  
**Formula:** C₂₀H₁₄N₅O₅  
**MW:** 431.5  
**CAS:** 1084893-56-0  
**DYRK Activity:** DYRK1A (IC₅₀=2.8 μM)  
**Other Kinase Activity:** CDK1, CDK2, CDK4, PDK1, ROCK-II  

**SB216763**  
*AG-CR1-3659*  
**Formula:** C₁₆H₁₂ClN₂O₂  
**MW:** 371.2  
**CAS:** 280744-09-4  
**DYRK Activity:** DYRK1A (IC₅₀=0.8μM)  
**Other Kinase Activity:** GSK3α, GSK3β  

**SB415286**  
*AG-CR1-3658*  
**Formula:** C₁₆H₁₂ClN₂O₂  
**MW:** 371.2  
**CAS:** 280744-09-4  
**DYRK Activity:** DYRK1A (IC₅₀=0.8μM)  
**Other Kinase Activity:** GSK3α, GSK3β  

**Staurosporine**  
*AG-CN2-0022*  
**Formula:** C₁₈H₁₆N₄O₃  
**MW:** 466.5  
**CAS:** 62996-74-1  
**DYRK Activity:** DYRK1A (IC₅₀=20nM)  
**Other Kinase Activity:** PDK1, CaMK, MLCK, PKC, PDK1, CDK1/cyclin B, CDK2/cyclin A, CDK4/cyclin D1, CDK5/p25, GSK-3β, Pim-1  

---

**Note:** All indicated IC₅₀ Values are from Literature References.

For updated prices and additional information visit [www.adipogen.com](http://www.adipogen.com) or contact your local distributor.
Leucettamine DYRK1A Inhibitor

Leucettine L41
Formula: C_{17}H_{13}N_{3}O_{3} | MW: 307.3 | CAS: 1112978-84-3
DYRK Activity: DYRK1A (IC_{50}=40nM) | DYRK2 (IC_{50}=35nM)
Other Kinase Activity: CLK1, CLK3, GSK-3α/β, PIM1

Potent DYRK1A Inhibitors

A-443654
Formula: C_{16}H_{15}N_{5}O | MW: 397.5 | CAS: 552325-16-3
DYRK Activity: DYRK1A (IC_{50}=17nM)
Other Kinase Activity: DYRK1A, DYRK2

CX-4945 . HCl
Formula: C_{17}H_{13}ClN_{3}O_{2} . HCl | MW: 349.8 | CAS: 1009820-21-6 (free acid)
DYRK Activity: DYRK1A (IC_{50}=6.8nM) | DYRK1B (IC_{50}=6.4nM) | DYRK3 (IC_{50}=18nM)
Other Kinase Activity: CK2, CLks

DYRK1B/DYRK2-4 Inhibitors

Note: All indicated IC_{50} Values are from Literature References.

NEW AZ191
Formula: C_{16}H_{14}BrN_{3}O_{4} | MW: 356.2 | CAS: 916440-85-2
DYRK Activity: DYRK1A (IC_{50}=1.9 μM) | DYRK2 (IC_{50}=1.3 μM)
Other Kinase Activity: Aurora B Kinase, Aurora C Kinase, Flt3

NEW CK2 Inhibitor 10
Formula: C_{16}H_{14}BrN_{3}O_{4} . 0.5H_{2}O | MW: 354.4 | CAS: 1361229-76-6
DYRK Activity: DYRK1B
Other Kinase Activity: CK2α, Flt3

7BIO
Formula: C_{16}H_{14}BrN_{3}O_{4} | MW: 356.2 | CAS: 916440-85-2
DYRK Activity: DYRK1A (IC_{50}=1.9 μM) | DYRK2 (IC_{50}=1.3 μM)
Other Kinase Activity: Aurora B Kinase, Aurora C Kinase, Flt3

ID-8
Formula: C_{16}H_{14}BrN_{3}O_{4} | MW: 356.2 | CAS: 916440-85-2
DYRK Activity: DYRK2 | DYRK4