



## Technical Data Sheet: CHIR99021

Catalog Number	SML01B
Synonyms	CT 99021, CHIR-99021, CHIR 99021
Size	10 mg
Description	CHIR99021 is a highly-potent and -selective inhibitor of GSK3 $\alpha$ (IC <sub>50</sub> of 10) and GSK3 $\beta$ (IC <sub>50</sub> of 6.7), exhibiting over 500-fold selectivity when compared to its nearest homologs. CHIR99021 has been an effective component within differentiation protocols of pluripotent stem cells (PSCs) into human pancreatic beta cells (Pagliuca, et al.), neural progenitor cells (Li, et al. & Qi, et al.), cardiovascular progenitor cells (Cao, et al.), and functional cardiomyocytes (Lian, et al. & Burridge, et al.). Additionally, CHIR99021 has been shown to promote the induction of human PSCs (Li, W. et al.) and self-renewal of PSCs for maintenance purposes (Ying, et al.).
Molecular Weight	465.34
Molecular Formula	C <sub>22</sub> H <sub>18</sub> Cl <sub>2</sub> N <sub>8</sub>
Chemical Name	3-Pyridinecarbonitrile, 6-[[2-[[4-(2,4-dichlorophenyl)-5-(5-methyl-1H-imidazol-2-yl)-2-pyrimidinyl]amino]ethyl]amino]-
CAS Number	252917-06-9
Target	GSK3; Autophagy
Appearance	White to yellow (Solid)
Purity	≥95% by NMR
Solubility and Reconstitution	Soluble in DMSO up to 20mM, for example: 10 mg/107.448 mL = 0.093 mg/mL = 0.2 mM 10 mg/21.489 mL = 0.465 mg/mL = 1 mM 10 mg/4.298 mL = 2.330 mg/mL = 5 mM 10 mg/2.149 mL = 4.650 mg/mL = 10 mM
Storage Temperature and Stability	Powder: -20°C 3 years 4°C 2 years In solvent: -80°C 6 months -20°C 1 month
References	Burridge, et al. 2015. Chemically defined culture and cardiomyocyte differentiation of human pluripotent stem cells. <i>Curr Protoc Hum Genet.</i> 87(1): 1-15.  Cao, et al. 2013. Highly efficient induction and long-term maintenance of multipotent cardiovascular progenitors from human pluripotent stem cells under defined conditions. <i>23:1119-11132.</i>  Li, et al. 2011. Rapid induction and long-term self-renewal of primitive neural precursors from human embryonic stem cells by small molecule inhibitors. <i>PNAS.</i> 108(20): 8299-304.



Li, W., et al. 2009. Generation of human-induced pluripotent stem cells in the absence of exogenous Sox2. *Stem Cells* 27: 2992-3000. PMID: 19839055.

Lian, et al. 2013. Directed cardiomyocyte differentiation from human pluripotent stem cells by modulating Wnt/ $\beta$ -catenin signaling under fully defined conditions. *Nature Protocols* 8(1): 162-175.

Pagliuca, et al. 2014. Generation of functional human pancreatic  $\beta$  cells in vitro. *Cell* 159: 428-439.

Qi, et al. 2017. Combined small-molecule inhibition accelerates the derivation of functional cortical neurons from human pluripotent stem cells. *Nature Biotechnology* 35(2): 154-163.

Ying, Q., et al. 2008. The ground state of embryonic stem cell self-renewal. *Nature* 453: 519-523. PMID: 18497825.