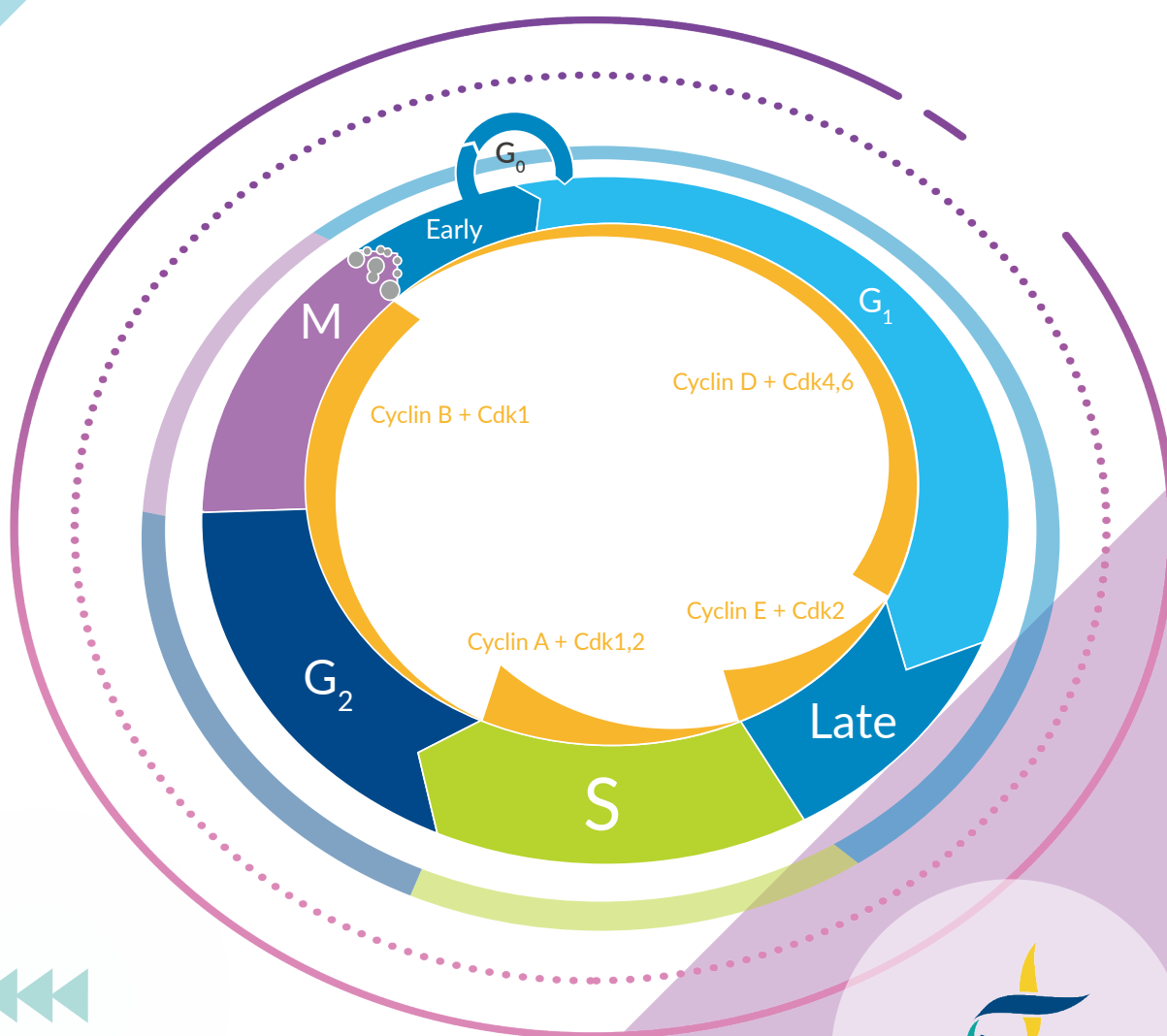


細胞週期與DNA損傷

CELL CYCLE & DNA Damage



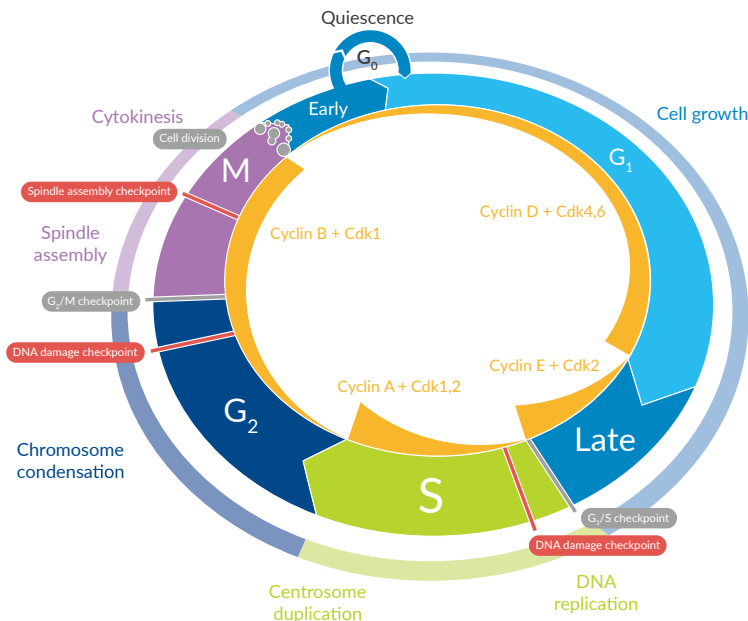
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細胞週期 Cell cycle

在細胞週期 (cell cycle) 中是透過週期蛋白依賴性激酶或週期素依賴性激酶 (cyclin-dependent kinases, CDKs) 來調控細胞生長 (cell growth)、DNA 複製 (DNA replication) 與細胞分裂 (cell division) 的所有過程。在整個細胞週期中有幾個檢查站 (checkpoint)，為錯誤的訊息或是訊號把關，例如：DNA 損傷、紡錘體 (spindle) 形成不當等，確保細胞週期能夠持續運轉。當細胞週期運轉異常時，可能會造成細胞異常增殖與基因組的不穩定性，最終導致癌症細胞的產生。



Cell cycle assay kit

Item No. 10009349

- Easy-to-use kit for flow cytometric analysis of cell cycle progression
- Determine the percentage of cells in G0/G1, G2, or S phase

Senescence-Associated β -Galactosidase Staining Kit

Item No. 602010

- Enables visual detection of senescent cells using a chromogenic substrate

貨號	品名
700160	Myeloperoxidase (MPO) Peroxidation Fluorometric Assay Kit
10006438	Myeloperoxidase (MPO) Chlorination Fluorometric Assay Kit
600450	Glycolysis Cell-Based Assay Kit
700470	Pyruvate Assay Kit
700510	L-Lactate Assay Kit
10011725	Glycerol Cell-Based Assay Kit
701350	α -Ketoglutarate Fluorometric Detection Assay Kit
10006908	Adipogenesis Assay Kit
10009381	Adipolysis Assay Kit
701490	Deubiquitinases (DUB) Activity Assay Kit
703202	Glutathione Reductase Assay Kit
703102	Glutathione Peroxidase Assay Kit



週期蛋白依賴性激酶 CDKs

CDKs 激酶與特定的細胞週期蛋白因子共同調控細胞週期中各個階段。當 CDKs 激酶功能異常時則會引發癌症細胞的產生。不同的 CDKs 激酶與其因子調控的階段如下：

Cdk4/cyclin D 和 Cdk6/cyclin D : G1 phase

Cdk2/cyclin E : S phase 初期

Cdk1/cyclin A 和 Cdk2/cyclin A : S phase

Cdk1/cyclin B : 有絲分裂 (mitosis)

貨號	品名	活性
21765	Butyrolactone I	An ATP-competitive inhibitor of Cdk1 (IC ₅₀ = 20 µg/ml in PC-14 cells); induces dose-dependent G2/M arrest, inhibits DNA synthesis, and decreases Cdk1 protein expression in vitro
18859	Cdk1/2 Inhibitor III	A cell-permeable inhibitor of Cdk1/cyclin B and Cdk2/cyclin A (IC ₅₀ s = 0.6 and 0.5 nM, respectively)
17666	LEE011	Targets Cdk4/cyclin D1 and Cdk6/cyclin D3 at nanomolar concentrations; prevents CDK-mediated G1/S phase transition, arresting the cell cycle in the G1 phase, suppressing DNA synthesis, and inhibiting cancer cell growth
21560	LY2835219	Orally bioavailable dual inhibitor of Cdk4 and Cdk6 (IC ₅₀ s = 2 and 10 nM, respectively); induces G1 arrest
13317	NU 6102	Inhibits Cdk1 and Cdk2 (IC ₅₀ s = 9.5 and 5.4 nM, respectively); delays cell entry into mitosis
21474	PHA-848125	An ATP-competitive inhibitor of Cdk2/cyclin A (IC ₅₀ = 45 nM); at least 3-fold less potent at Cdk1, -3, -4, -5, and -7
16273	PD 0332991 (hydrochloride)	An orally active, selective inhibitor of Cdk4 (IC ₅₀ = 11 nM) and Cdk6 (IC ₅₀ = 16 nM); induces G1 arrest
15149	Ro 3306	A cell-permeable, reversible inhibitor of Cdk1; selective for Cdk1/cyclin B1 (K _i = 35 nM) over Cdk1/cyclin A (K _i = 110 nM); induces reversible cell cycle arrest at the G2/M phase border
10009569	(R)-Roscovitine	An inhibitor of Cdk2/cyclin E (IC ₅₀ = 0.1 µM); also inhibits Cdk7/cyclin H, Cdk5/p35, and cell division cycle (cdc)/cyclin B (IC ₅₀ s = 0.49, 0.16, and 0.65 µM, respectively)



DNA 損傷劑 DNA damaging agents

內源性的壓力來源：活性氧類（ROS）、拓撲異構酵素抑制劑（topoisomerase inhibitors）、DNA 烷化劑（DNA alkylating）或交聯劑 crosslinking agents，以及核苷類似物（nucleoside analogs）等皆有可能會造成 DNA 損傷，進而影響細胞週期。

臨床上使用的化療藥物，是透過 S phase 的活化來引發 DNA 損傷，進而抑制癌症細胞 DNA 的複製，促進癌症細胞的老化與凋亡，抑制癌症細胞的生長。

DNA Topoisomerase Inhibitors

DNA 單股或雙股螺旋的裂解可以透過抑制 DNA topoisomerase 酵素活性完成

貨號	品名
11694	Camptothecin
15007	Doxorubicin (hydrochloride)
12092	Etoposide
14180	Irinotecan (hydrochloride hydrate)
14129	Topotecan (hydrochloride)

DNA Alkylating Agents

烷基與 DNA 鹼基對反應，誘導 DNA 雙股螺旋鏈接的分裂，抑制細胞分裂，促進細胞死亡

貨號	品名
23693	Bendamustine (hydrochloride)
19527	4-hydroperoxy Cyclophosphamide
16665	Melphalan
11435	Mitomycin C
14163	Temozolomide

DNA Crosslinking Agents

含鉑 (platinum) 的 DNA 交聯劑與 DNA 或是 DNA 蛋白交聯，干擾 DNA 和 RNA 的生成

貨號	品名
13112	Carboplatin
13119	Cisplatin
29001	Nedaplatin
13106	Oxaliplatin

Nucleoside Analogs

這些抗癌劑可以在複製過程中結合到 DNA 中，導致複製又停滯和鏈終止。多種核苷類似物也抑制關鍵的細胞酶

貨號	品名
16069	Cytarabine
14154	Floxuridine
14128	Fludarabine
14416	5-Fluorouracil
11690	Gemcitabine
21366	Trifluorothymidine

搜尋 www.exbio.com.tw 索取更多資訊

DNA/RNA Oxidative Damage (High Sensitivity) ELISA Kit

Item No. 589320

Measure the major oxidative damage markers 8-hydroxy-2'-deoxyguanosine, 8-hydroxyguanosine, and 8-hydroxyguanine in a variety of sample types.

DNA/RNA Oxidative Damage (Clone 7E6.9) ELISA Kit

Item No. 501130

Measure the DNA oxidative damage marker 8-hydroxy-2'-deoxyguanosine and the RNA damage marker 8-hydroxyguanosine with equal selectivity and sensitivity.



DNA 損傷檢查站與修復

DNA Damage Checkpoints & Repair

DNA 損傷的檢測可以激活 G1 期、S 期和 G2/M 過渡期的細胞週期檢查點，以阻止細胞週期並進行 DNA 修復。當 DNA 複製壓力增加時，Ataxia-telangiectasia 和 Rad3 相關蛋白 / 激酶 (ATR) 會被激活，使單股斷裂；而當 Ataxia-telangiectasia mutated kinase (ATM) 活化時，則使雙股螺旋斷裂。ATR 和 ATM 也會個別活化 Chk1 和 Chk2 激酶，進而調控下游的 CDK/cyclin complexes 與細胞週期的運轉。透過抑制 ATR/ATM-Chk1/Chk2 路徑，Wee1 蛋白或是 DNA 修復酵素可以加劇 DNA 的損傷，促進細胞減數分裂，最終導致有細胞死亡或衰老。

ATM inhibitors

貨號	品名
25648	AZD 0156
16336	Ku-55933
17502	Ku-60019

ATR inhibitors

貨號	品名
17589	AZ 20
21035	AZD 6738
17587	VE-821

Wee1 Inhibitors

貨號	品名
21266	MK-1775
35391	Wee1 Inhibitor

DNA Ligase Inhibitors

貨號	品名
18374	L189
22941	L67
18015	SCR7

Chk1 Inhibitors

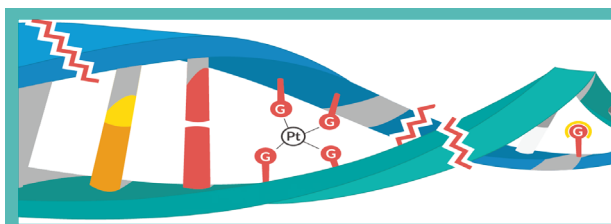
貨號	品名
34300	GDC-0575
20351	LY2603618
21490	LY2606368
17859	PF-477736
18131	SCH 900776
18130	UCN-01

Chk2 Inhibitors

貨號	品名
19178	CCT241533 (hydrochloride)
21184	Chk2 Inhibitor
19811	NSC 109555

PARP1 Inhibitors

貨號	品名
11505	ABT-888 (hydrochloride)
19782	BMN 673
20842	MK-4827 (tosylate)
10621	Olaparib
33182	Pamiparib
15643	Rucaparib



更多產品資訊，歡迎洽詢 Cayman Chemical 台灣獨家代理 - 昶安生技

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紡錘體組裝檢查點

Spindle Assembly Checkpoint

當有絲分裂期間存在未連接或不正確連接的著絲點 (kinetochores) 時，紡錘體檢查點 (spindle checkpoint) 被激活，進而抑制促後期複合體 (anaphase-promoting complex/cyclosome, APC/C)，且避免細胞週期進展至後期階段。Mad2、BubR1、Bub3 以及 APC/C 共激活因子 - Cdc20 聚集在有絲分裂檢查點複合體 (mitotic checkpoint complex)，與激酶：Bub1、Mps1、Aurora B 和 Plk1 共同參與 SAC 的調節。

Mitotic Checkpoint Complex Modulators

貨號	品名
17080	Apcin
22297	M2I-1
17550	N-4-Tosyl-L-arginine methyl ester (hydrochloride)
25835	proTAME

Plk1 Inhibitors

貨號	品名
17385	BI-2536
18193	BI-6727
18099	GSK461364
15553	ON-01910 (sodium salt)
21669	Ro 3280

Mps1 Inhibitors

貨號	品名
19991	AZ 3146
21660	BAY 12-17389
19175	Mps1-IN-1
25554	Mps1/TTK Inhibitor
31613	NMS-P715
10004412	Reversine

Aurora B Inhibitors

貨號	品名
13647	AZD 1152 (hydrochloride)
11602	AZD 1152-HQPA
24199	Hesperadin
13601	ZM 447439

Modulators of Microtubule Dynamics

微管抑制劑 (microtubule inhibitors) 結合 β -微管蛋白 (β -tubulin)，影響微管動力學和有絲分裂紡錘體結合，活化紡錘體組裝檢查點。紫杉醇類 (Taxanes) 穩定微管 (pre-existing microtubules)，而長春花生物鹼 (Vinca alkaloids) 則防止微管聚合 (microtubules polymerization)。

Taxanes

貨號	品名
22262	Cabazitaxel
11637	Docetaxel (hydrate)
10461	Paclitaxel
20741	7-epi Paclitaxel

Vinca Alkaloids

貨號	品名
11762	Vinblastine (sulfate)
11764	Vincristine (sulfate)
21262	Vinorelbine (tartrate)

