

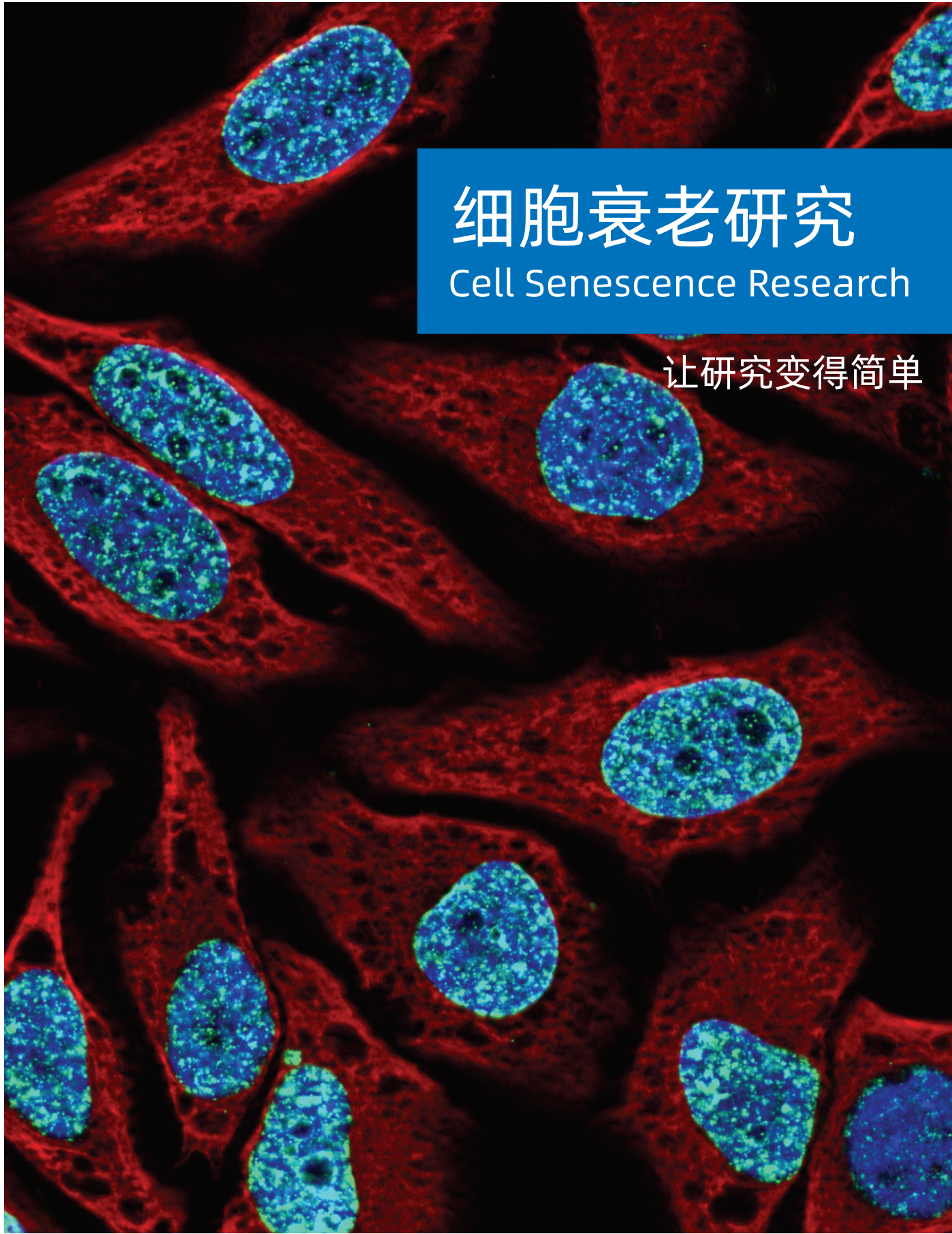


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细胞衰老研究

Cell Senescence Research

让研究变得简单

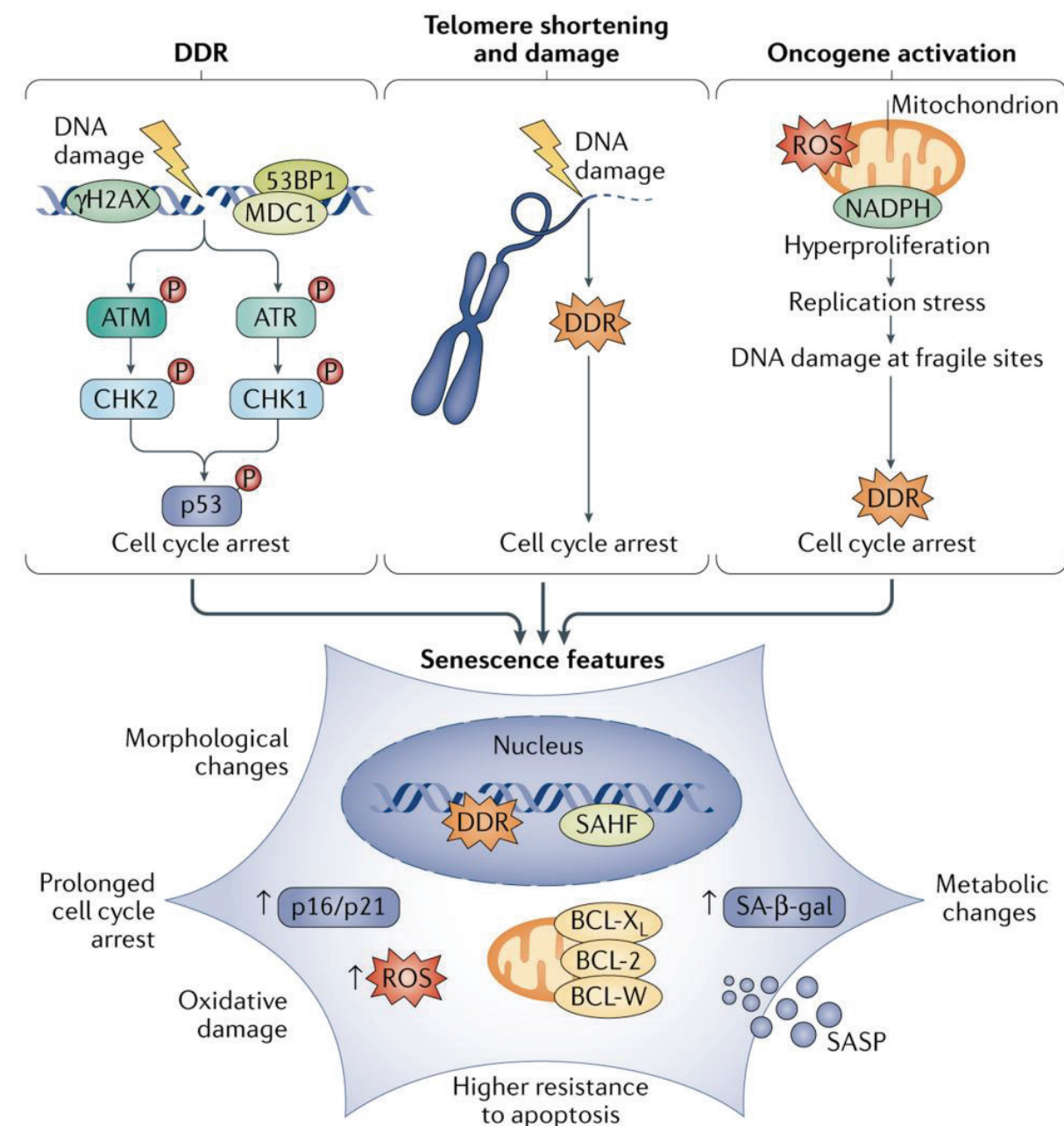


CONTENTS

录

1. 衰老信号的“双刃剑”效应	01-03
1.1 细胞衰老与心血管疾病	02
1.2 细胞衰老与癌症	02-03
1.3 细胞衰老与神经退行性疾病	03
2. 靶向衰老治疗相关疾病	04-05
3. 衰老研究的检测工具	05-10
3.1 细胞衰老的检测方法	05
3.2 抗体小包装	06
3.3 优质一抗	07
4. 客户文献引用案例	11-12

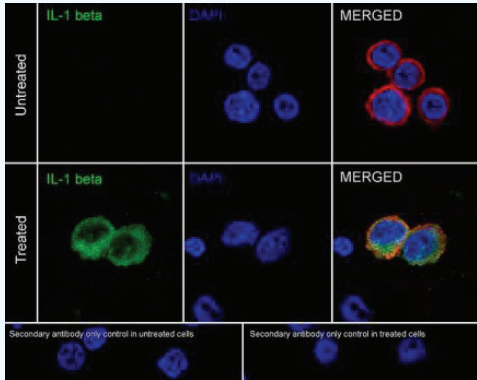
随着寿命的延长，机体应对各种应激（如DNA损伤，端粒缩短，癌基因诱导等）产生一类特殊的细胞，称为“衰老细胞”（Senescent Cells）。正常生理条件下，细胞衰老会停止分裂、增殖，有利于防止可能的恶性转化。然而，当体内衰老细胞未被及时清除时，会形成衰老相关分泌表型（SASP），扰乱组织微环境，进一步推动慢性炎症和相关疾病的进展。



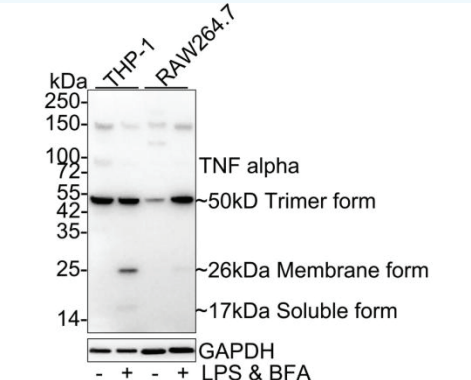
衰老的主要诱因及衰老细胞的特征
PMID: 33328614

细胞衰老与心血管疾病

SASP对心血管疾病的调控作用	
主要靶标	在衰老心肌细胞中的作用
IL-1	诱导心脏微环境局部炎症
IL-6	诱导心脏微环境局部炎症
TNF-α	诱导心脏微环境局部炎症
Edn3	诱导心脏成纤维细胞纤维化，激活肌纤维母细胞
GDF15	诱导心脏成纤维细胞纤维化，激活肌纤维母细胞
TGF-β	诱导心脏成纤维细胞纤维化，激活肌纤维母细胞



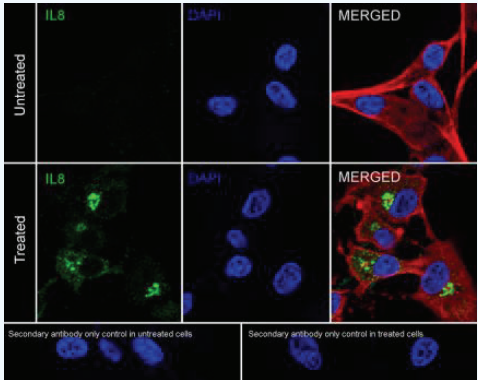
IL-1 beta rabbit mAb | ET1701-39
使用IL-1 beta 兔单抗（绿色）对依次用TPA、LPS、BFA处理的THP-1 细胞（TPA 80nM overnight; LPS 100ng/mL 6h; BFA 300ng/mL 3h）进行 IF-Cell 分析。肌动蛋白丝用Beta tubulin（M1305-2，红色）标记。



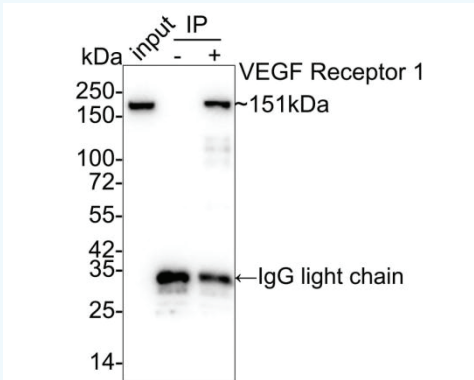
TNF alpha rabbit mAb | HA722022
使用TNF alpha 兔单抗对用LPS及BFA处理的THP-1细胞（LPS 500ng/mL 24h; BFA 300ng/mL 20h）和RAW264.7 细胞（LPS 100ng/mL 7h; BFA 300ng/mL 3h）进行 WB 分析。

细胞衰老与癌症

SASP对肿瘤调控的双面性	
主要靶标	在肿瘤细胞中的作用
IGFBP-7	加强细胞衰老，降低癌基因表达，从而抑制癌细胞转化与转移
IL-8	加强细胞衰老，降低癌基因表达，从而抑制癌细胞转化与转移
MCP-1	激活免疫系统，促进衰老细胞的清除，预防肿瘤细胞的发生发展
RAS	响应衰老信号对肿瘤的抑制调控作用，预防肿瘤细胞的发生发展
BRAF	响应衰老信号对肿瘤的抑制调控作用，预防肿瘤细胞的发生发展
CTACK	激活免疫系统，促进衰老细胞的清除，预防肿瘤细胞的发生发展
VEGF	促进肿瘤血管形成，协助肿瘤免疫逃逸
MMPs	降解胞外基质，重塑肿瘤微环境，有助于肿瘤运动、侵袭和转移



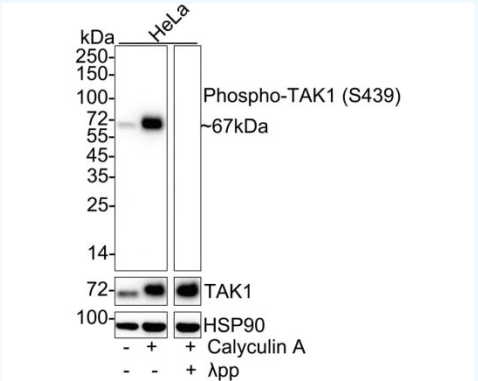
IL-8 rabbit pAb | ER1901-61
使用IL-8 兔多抗（绿色）对使用Thapsigargin处理的U-87 MG细胞（Thapsigargin 1μM 24h）进行 IF-Cell 分析。肌动蛋白丝用Beta tubulin（HA601187，红色）标记。



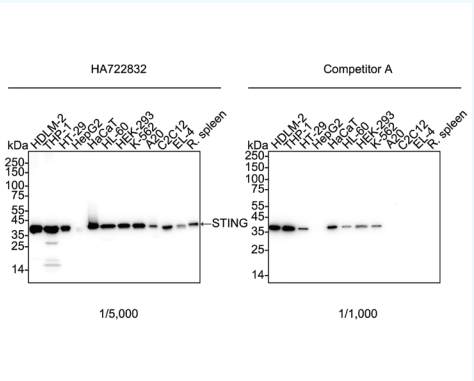
VEGF Receptor 1 rabbit mAb | ET1605-11
使用VEGF Receptor 1 兔单抗对MCF7细胞进行 IP 分析。
Lane 1: MCF7 cell lysate (input)
Lane 2: Rabbit IgG instead of ET1605-11 in MCF7 cell lysate
Lane 3: ET1605-11 IP in MCF7 cell lysate

细胞衰老与神经退行性疾病

衰老信号对神经退行性疾病的调控	
主要靶标	在神经退行性疾病中的作用
TBK1	是RIPK1介导的细胞死亡通路重要激酶的天然抑制因子
TAK1	表达受衰老信号抑制，减少其与TBK1突变体结合作用，使RIPK1活化，引发与衰老相关的神经退行性疾病
RIPK1	作为死亡信号调控的关键因子
mtDNA	衰老信号促进小胶质细胞mtDNA释放，激活cGAS-STING通路，诱导神经炎症
STING	衰老信号刺激下，参与cGAS-STING通路的激活，促进衰老相关神经退行性病的发生发展



Phospho-TAK1 (S439) rabbit mAb | HA722242
使用Phospho-TAK1（S439）兔单抗对用Calyculin A及λpp处理的 HeLa 细胞（Calyculin A 100ng/mL 30min; λpp 1h）进行 WB 分析。

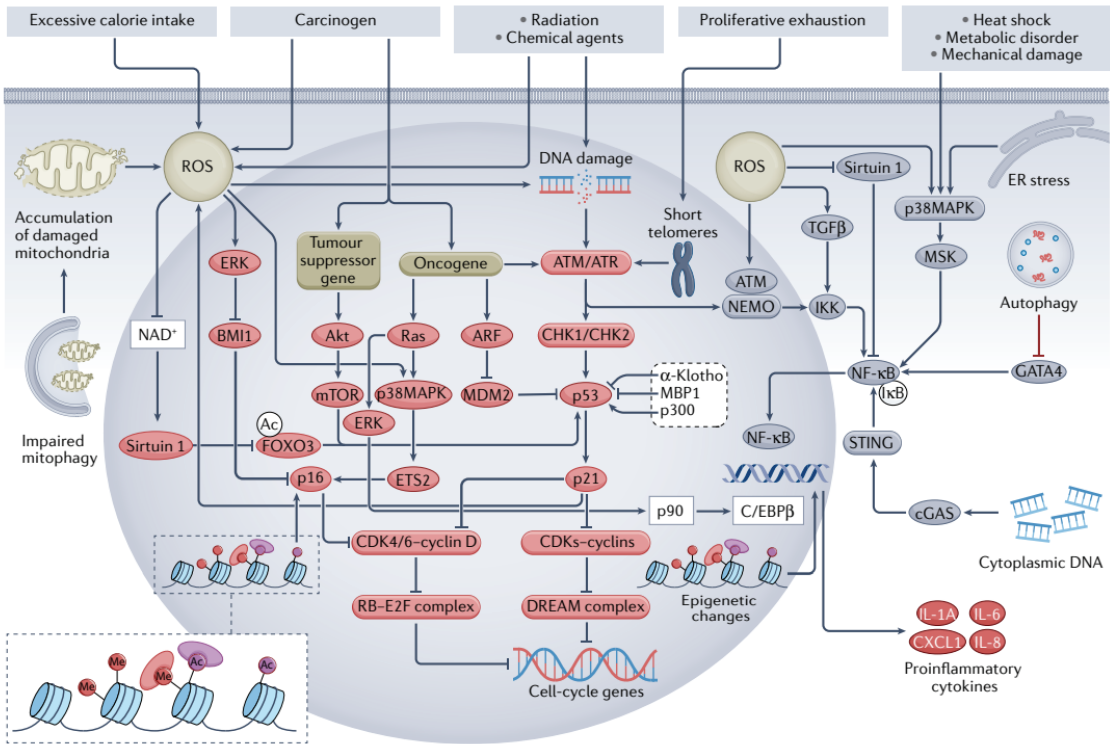


STING rabbit mAb | HA722832
使用STING 兔单抗（稀释比1/5，000）和竞品A（稀释比1/1，000）对不同类型的样本裂解液进行 WB 分析。

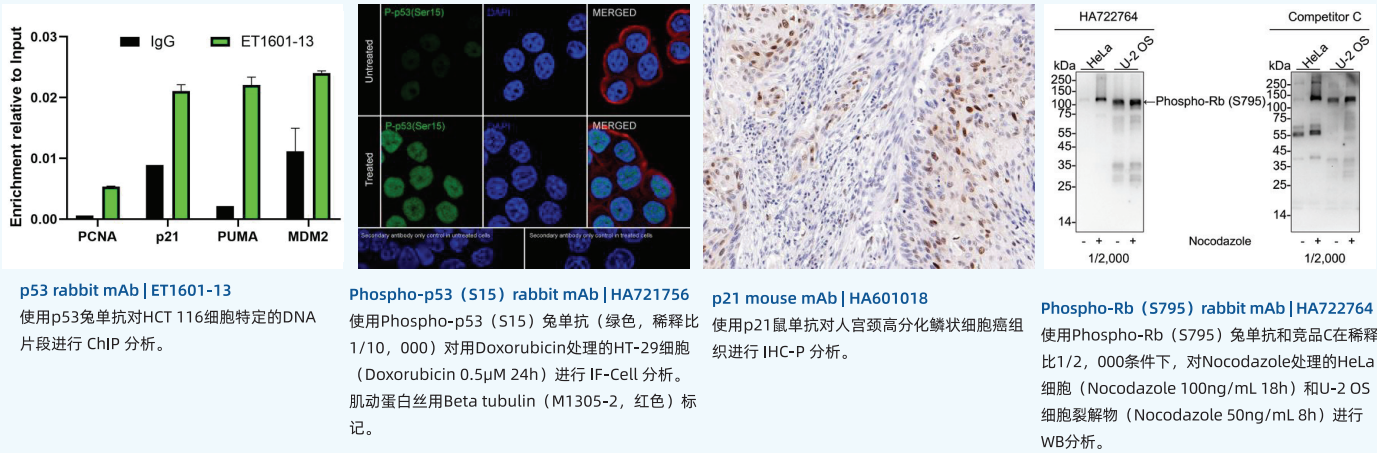
衰老的“双刃剑”效应带来的不可逆细胞周期阻滞，线粒体功能改变，活性氧水平增高，自噬失能及SASP等衰老信号，导致衰老细胞中形成一种高度稳定且不易分解的聚集体“脂褐素（Lipofuscin）”，其广泛分布于不同类型的衰老细胞，同时具有强烈的自体荧光特性。相比衰老细胞，脂褐素在正常细胞中的含量和分布极低，这使得它成为一种极具潜力的衰老细胞“定位标记”。最新研究发现，通过构建脂褐素结合域（Lipofuscin Binding Domain, LBD）、连接子（Linker）和清除药物（Senolytic Drug）的创新性化合物，靶向并精准清除衰老细胞（Senolysis），有望成为治疗衰老相关疾病，如癌症，心血管疾病，神经退行性疾病等的重要策略。

衰老研究的核心调控路径

衰老研究的核心调控路径		
主要调控路径	在衰老中的作用	核心调控靶点
p53-p21	主要负责端粒酶缩短及DNA损伤引起的衰老	CDKs, ATM, ATR, Chk1, Chk2, p53, p21
p16-pRB	pRB主要通过抑癌基因p16途径，促进细胞衰老	Cyclin D, CDK4, CDK6, pRB, p16
PTEN-p27	PTEN上调p27表达，并通过其蛋白磷酸酶活性，下调Cyclin D1，抑制细胞周期阻滞及细胞衰老	PI3K, AKT, Cyclin E, CDK2, Cyclin D1, PTEN, p27



细胞衰老调控通路图
PMID: 35922662



p53 rabbit mAb | ET1601-13
使用p53兔单抗对HCT 116细胞特定的DNA片段进行ChIP分析。

Phospho-p53 (S15) rabbit mAb | HA721756
使用Phospho-p53 (S15) 兔单抗（绿色，稀释比1/10,000）对用Doxorubicin处理的HT-29细胞（Doxorubicin 0.5μM 24h）进行IF-Cell分析。肌动蛋白丝用Beta tubulin (M1305-2, 红色) 标记。

p21 mouse mAb | HA601018
使用p21鼠单抗对人宫颈高分化鳞状细胞癌组织进行IHC-P分析。

Phospho-Rb (S795) rabbit mAb | HA722764
使用Phospho-Rb (S795) 兔单抗和竞品C在稀释比1/2,000条件下，对Nocodazole处理的HeLa细胞（Nocodazole 100ng/mL 18h）和U-2 OS细胞裂解物（Nocodazole 50ng/mL 8h）进行WB分析。

衰老研究的检测工具

细胞衰老的检测方法

筛选衰老细胞	细胞形态的改变： 细胞更大、更扁平	检测方法： SEM电镜，光学显微镜
	代谢改变： SA-B-Gal, a-fucosidase, Lipofuscin水平增加	检测方法： IF, ELISA
	细胞周期阻滞： p15 ^{INK4B} , p16 ^{INKA} , p21 ^{CIP1} , p53, pRb水平增加；Ki67, Brdu, EdU水平降低	检测方法： WB, IHC, IF
使用衰老相关标记进行验证	凋亡阻滞： Caspases, Bcl-2, Cleaved PARP	检测方法： WB, IHC, IF
		Annexin V-FITC/PI assay
使用衰老特定标记进行最终验证	DNA损伤： p-γH2AX, 53BP, ATM, ATR	检测方法： WB, IHC, IF, ChIP
	衰老相关分泌表型： IL-6, IL-8, TNF-α, MCP-1, MMP-3等水平增加	检测方法： WB, IHC, IF, ELISA

抗体小包装

Senescence Marker Antibody Sampler Kit | HAK21082

Product Includes	Catalog#	Quantity	Reactivity	Tested applications
p16	HA601131	20µl	Human	IHC-P,WB,IF-Cell
p21	HA722685	20µl	Human	WB,IF-Cell,IHC-P,IP
Phospho-Histone H2A.X (S139)	ET1602-2	20µl	Human,Mouse,Rat	WB,IHC-P,IF-Cell
Lamin B1	ET1606-27	20µl	Human,Mouse,Rat	WB,IF-Tissue,IHC-P,CUT&Tag-seq
HMGB1	ET1601-2	20µl	Human,Mouse,Rat	WB,IF-Cell,IF-Tissue,IHC-P,FC
IL-6	R1412-2	20µl	Human,Mouse,Rat	WB,IF-Cell,IHC-P,FC
TNF alpha	HA722022	20µl	Human,Mouse	WB
MMP-3	ET1705-98	20µl	Human,Mouse,Rat	WB,IHC-P
Goat Anti-Rabbit IgG (H+L)	HA1001	100µl	Rabbit	WB,ELISA,IHC-P
Goat Anti-Mouse IgG (H+L)	HA1006	100µl	Mouse	WB,ELISA,IHC-P

Senescence Associated Secretory Phenotype (SASP) Antibody Kit | HAK21006

Product Includes	Catalog#	Quantity	Reactivity	Tested applications
IL-1 beta	HA601036	20µl	Human,Mouse,Rat	WB,ELISA,IHC-P
RANTES	ET1705-70	20µl	Human,Mouse	WB,IHC-P,IF-Cell,IF-Tissue
IP10	ET1704-27	20µl	Human	WB,IF-Cell,IF-Tissue,IHC-P
PAI1	HA601152	20µl	Human,Mouse,Rat	WB,IHC-P,IF-Tissue,FC
IL-6	R1412-2	20µl	Human,Mouse,Rat	WB,IF-Cell,IHC-P,FC
TNF alpha	HA722022	20µl	Human,Mouse	WB
MMP-3	ET1705-98	20µl	Human,Mouse,Rat	WB,IHC-P
CCL2/MCP1	HA500042	20µl	Human	WB,IHC-P,IF-Cell
Goat Anti-Rabbit IgG (H+L)	HA1001	100µl	Rabbit	WB,ELISA,IHC-P
Goat Anti-Mouse IgG (H+L)	HA1006	100µl	Mouse	WB,ELISA,IHC-P

优质一抗

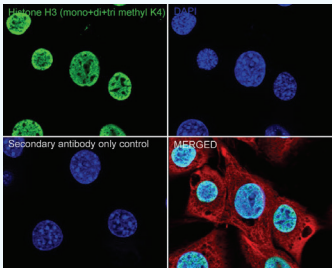
Product name	Catalog#	Reactivity	Tested applications	Antibody type
AMPK gamma 1	HA722691	H,Ms,R	WB,IP	Rabbit mAb
ATM	ET1606-20	H,R	WB,IF-Cell,IF-Tissue,IHC-P	Rabbit mAb
Phospho-ATM (S1981)	ET1705-50	H,Ms	WB,IF-Cell,IF-Tissue,IHC-P,IP,FC	Rabbit mAb
ATR	HA500176	H,R	WB,IHC-P	Rabbit pAb
Phospho-ATR (T1989)	HA721190	H	WB,IF-Cell	Rabbit mAb
Bcl-2	ET1603-11	H	WB,IF-Cell,IF-Tissue,IHC-P,IP,FC	Rabbit mAb
Bcl-2	ET1702-53	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,FC	Rabbit mAb
Bcl-2	HA720210F	H,Ms	FC	Rabbit mAb
Bcl-XL	ET1603-28	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,FC,IP	Rabbit mAb
Brd4	HA722785	H,Ms,R	WB,IHC-P,IF-Cell	Rabbit mAb
GLB1 / Beta-galactosidase	HA721562	H,Ms,R	WB,FC,IHC-P	Rabbit mAb
CCL2/MCP1	HA500042	H	WB,IHC-P,IF-Cell	Rabbit pAb
CD26	ET1703-93	H,Ms,R	WB	Rabbit mAb
E2F1	ET1701-73	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,IP,FC	Rabbit mAb
E2F2	ET1611-88	H,Ms,R	WB,FC	Rabbit mAb
Histone H2A.X	ET1705-97	H,Ms,R	WB,IF-Tissue,IHC-P,IP	Rabbit mAb
Phospho-Histone H2A.X (S139)	ET1602-2	H,Ms,R	WB,IHC-P,IF-Cell	Rabbit mAb
Histone H3	ET1701-64	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,ChIP,IP	Rabbit mAb
Histone H3	M1309-1	H,Ms,R,Z	WB,IF-Cell,IHC-P,IF-Tissue	Mouse mAb
Histone H3 (mono methyl K18)	ET1601-14	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P	Rabbit mAb
Phospho-Histone H3 (S10)	ET1601-30	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,IP,FC,ChIP	Rabbit mAb
Histone H3 (mono+di+tri methyl K79)	HA723068	H,Ms,R,Mk	WB,IHC-P,IF-Cell,ChIP	Rabbit mAb
Histone H3 (mono methyl K36)	ET1602-48	H,Ms	WB,IF-Cell,IF-Tissue,ChIP	Rabbit mAb
Histone H3 (mono methyl R2)	ET1609-8	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,ChIP	Rabbit mAb
Histone H3 (di methyl K9)	ET1611-51	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P	Rabbit mAb
Histone H3 (tri methyl K27)	HA722231	H,Ms,R	WB,IF-Cell,IHC-P,IF-Tissue,ChIP	Rabbit mAb
Histone H3 (mono methyl K14)	HA722232	H,Ms,R	WB,IF-Cell,ChIP,Dot Blot	Rabbit mAb
Histone H3 (mono methyl K9)	HA722350	H,Ms,R,Mk	WB,IF-Cell,IHC-P,FC,ChIP,IF-Tissue,Dot Blot	Rabbit mAb
Histone H3 (mono methyl K27)	HA722376	H,Ms,R	WB,IF-Cell,FC,ChIP	Rabbit mAb
Histone H3 (di methyl K27)	HA722486	H,Ms,R	WB,IF-Cell,ChIP	Rabbit mAb
Histone H3 (mono+di+tri methyl K4)	HA722662	H,Ms,R	WB,IHC-P,IF-Cell,FC,ChIP	Rabbit mAb
Histone H3 (mono+di+tri methyl K36)	HA722802	H,Ms,R	WB,IHC-P,IF-Cell,FC,ChIP	Rabbit mAb

Product name	Catalog#	Reactivity	Tested applications	Antibody type
Histone H3 (mono methyl K79)	HA722848	H,Ms,R,Mk	WB,IF-Cell,IHC-P,FC,ChIP	Rabbit mAb
Histone H3 (tri methyl K9)	M1112-3	H,Ms,R	WB,IF-Cell,IHC-P,IF-Tissue	Mouse mAb
Histone H3 (mono methyl K4)	R1110-1	H,Ms,R	WB,IF-Cell,IHC-P,FC,Dot Blot	Rabbit pAb
Histone H3 (mono methyl K4)	HA722803	H,Ms,R	WB,IF-Cell,ChIP,Dot Blot	Rabbit mAb
Histone H3 (di methyl K4)	R1110-3	H,Ms,R	WB,IF-Cell,IHC-P,FC,Dot Blot	Rabbit pAb
Histone H3 (di methyl K4)	HA722135	H,Ms,R,Mk	WB,IF-Cell,ChIP,Dot Blot,IHC-P	Rabbit mAb
Histone H3 (mutated K27 M)	HA722200	H,Ms	WB,IF-Cell,IHC-P,ChIP	Rabbit mAb
HMGB1	ET1601-2	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,FC	Rabbit mAb
HP1 alpha	ET1602-8	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P,IP	Rabbit mAb
IL-1 beta	ET1701-39	H	WB,IF-Cell,IF-Tissue,IHC-P,FC	Rabbit mAb
IL-1 beta	HA601002	H,Ms,R	WB,ELISA,IF-Cell	Mouse mAb
IL-1 beta	HA601036	H,Ms,R	WB,ELISA,IHC-P	Mouse mAb
IL-6	R1412-2	H,Ms,R	WB,IF-Cell,IHC-P,FC	Rabbit pAb
IL-6	M1303-3	Ms	WB,IF-Cell,FC,ELISA	Mouse mAb
IL-8	ER1901-61	H	WB,IHC-P,IF-Cell,FC	Rabbit pAb
IP10	ET1704-27	H	WB,IF-Cell,IF-Tissue,IHC-P	Rabbit mAb
ICAM1	ET1609-46	H	WB,IF-Tissue,IHC-P	Rabbit mAb
ICAM1	M1505-7	H	WB,IF-Cell,FC	Mouse mAb
Ki67	HA721115	H,Ms,R	IHC-P,IF-Tissue,mIHC,IF-Cell,FC,IHC-Fr	Rabbit mAb
Ki67	IRS036	H	mIHC	Rabbit mAb
Lamin B1	ET1606-27	H,Ms,R	WB,IF-Tissue,IHC-P,CUT&Tag-seq	Rabbit mAb
Lamin B1	HA720172F	H,Ms,R	IF-Tissue	Rabbit mAb
MMP-3	ET1705-98	H,Ms,R	WB,IHC-P	Rabbit mAb
p16INK4a	ET1608-62	H	WB,IF-Cell,IF-Tissue,IHC-P,FC,IP	Rabbit mAb
p21	HA722685	H	WB,IF-Cell,IHC-P,IP	Rabbit mAb
p21	HA722065	Ms	WB,IF-Cell,IHC-P,FC	Rabbit mAb
p53	ET1601-13	H	WB,IF-Cell,ChIP	Rabbit mAb
p53	ET1605-16	H	WB,IF-Cell,IF-Tissue,IHC-P,IP,FC	Rabbit mAb
p53 (acetyl K370)	ET1602-38	H,Ms,R	WB,IF-Cell,IF-Tissue,IP,FC	Rabbit mAb
Phospho-p53 (S392)	ET1606-24	H,Ms,R	WB,IHC-P,IP	Rabbit mAb
Phospho-p53 (T55)	ET1609-13	H	WB,IHC-P	Rabbit mAb
Phospho-p53 (S376)	ET1609-14	H,Ms	WB	Rabbit mAb
Phospho-p53 (S15)	HA721756	H	WB,IF-Cell	Rabbit mAb

Product name	Catalog#	Reactivity	Tested applications	Antibody type
Phospho-p53 (S33)	HA722703	H,Ms,R	WB,IF-Cell,IHC-P	Rabbit mAb
Phospho-p53 (S20)	HA722761	H	WB	Rabbit mAb
p53 (acetyl K382)	ET1612-71	H,Ms	WB,IF-Cell,IHC-P	Rabbit mAb
p53 (acetyl K382)	HA722763	H	WB,IF-Cell	Rabbit mAb
PAI1	HA601152	H,Ms,R	WB,IHC-P,IF-Tissue,FC	Mouse mAb
RANTES	ET1705-70	H,Ms	WB,IHC-P,IF-Cell,IF-Tissue	Rabbit mAb
Rb	ET1607-9	H,Ms	WB,IF-Cell,IF-Tissue,IHC-P,IP	Rabbit mAb
Phospho-Rb (S807)	ET1602-36	H,Ms,R	WB,IF-Cell,IF-Tissue,IHC-P	Rabbit mAb
Phospho-Rb (S780)	HA721513	H,Ms,R	WB	Rabbit mAb
Phospho-Rb (S795)	HA722764	H	WB,IF-Cell	Rabbit mAb
Phospho-Rb (S608)	HA723271	H,Mk	WB	Rabbit mAb
TNF alpha	HA722022	H,Ms	WB	Rabbit mAb
Human TNF alpha	HA721286	H	IHC-P,mIHC	Rabbit mAb

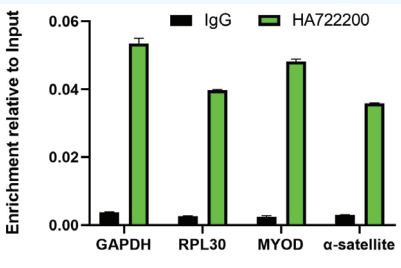
*H: Human; Ms: Mouse; R: Rat; Mk: Monkey; Z: Zebrafish

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“细胞衰老研究” 产品信息

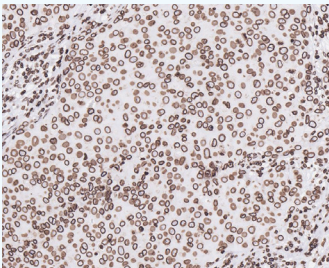


Histone H3 (mono+di+tri methyl K4) rabbit mAb | HA722662

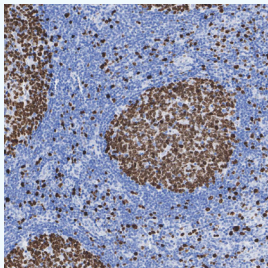
使用Histone H3 (mono+di+tri methyl K4) 兔单抗（绿色，稀释比1/500）对NIH/3T3细胞进行 IF-Cell 分析。
肌动蛋白丝用Beta tubulin（M1305-2，红色）标记。



Histone H3 (mutated K27 M) rabbit mAb | HA722200
使用Histone H3 (mutated K27 M) 兔单抗对293T细胞特定的DNA片段进行 ChIP 分析。



Lamin B1 rabbit mAb | ET1606-27
使用Lamin B1兔单抗对人乳腺癌组织进行 IHC-P 分析。



Ki67 rabbit mAb | HA721115
使用Ki67兔单抗对人扁桃体组织进行 IHC-P 分析。

Case 1

标题：A UTP3-dependent nucleolar translocation pathway facilitates pre-rRNA 5'ETS processing

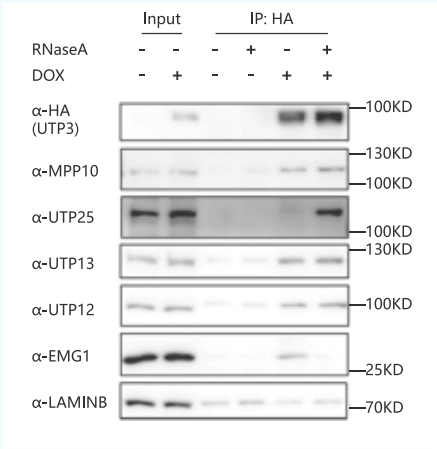
PMID: 39036955 IF: 16.6

期刊：Nucleic Acids Res. 2024 Sep 9;52(16):9671-9694.

产品名称：Lamin B1 rabbit mAb | ET1606-27

应用：WB

科研单位：浙江大学



Western blot showing the effect of RNase treatment on the interaction between UTP3 and the endogenous MPP10, UTP25, UTP12, UTP13 or EMG1. Total proteins were extracted from the DOX-inducible HA-UTP3 overexpression cells.

Case 2

标题：CD147-K148me2-Driven Tumor Cell-Macrophage Crosstalk Provokes NSCLC Immunosuppression via the CCL5/CCR5 Axis

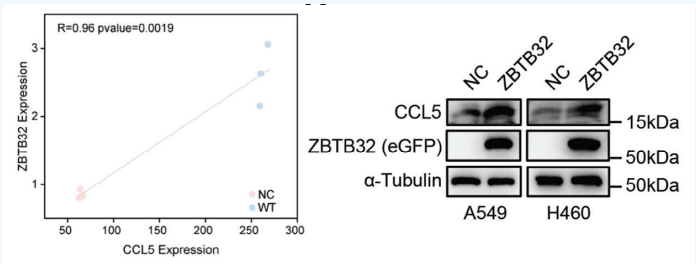
PMID: 38873823 IF: 15.1

期刊：Adv Sci (Weinh). 2024 Aug;11(29):e2400611.

产品名称：RANTES rabbit mAb | ET1705-70

应用：WB

科研单位：第四军医大学



The correlation between ZBTB32 and CCL5 (RANTES) expression was analyzed in the NC and WT groups using RNA-seq data (R = 0.96, P = 0.0019); CCL5 expression was determined in the ZBTB32-overexpressing cells (A549 and H460) by western blot.

Case 3

标题：Injectable hydrogel encapsulating siMMP13 with anti-ROS and anti-apoptotic functions for osteoarthritis treatment

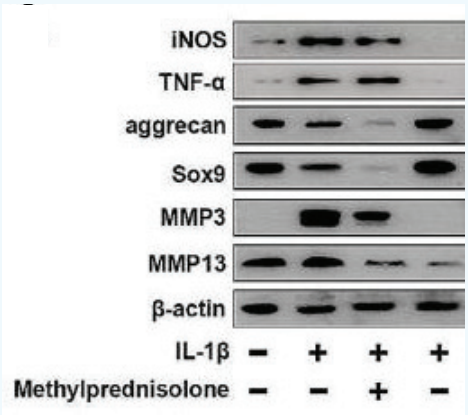
PMID: 39095867 IF: 10.6

期刊：J Nanobiotechnology. 2024 Aug 2;22(1):466.

产品名称：MMP-3 rabbit mAb | ET1705-98

应用：WB

科研单位：浙江大学



WB validation of iNOS, TNF-α, aggrecan, Sox9, Adamts5, MMP13, and MMP3 expression levels in chondrocytes after treatment with methylprednisolone and composite hydrogel (n = 4).

Case 4

标题：Nuclear KRT19 is a transcriptional corepressor promoting histone deacetylation and liver tumorigenesis

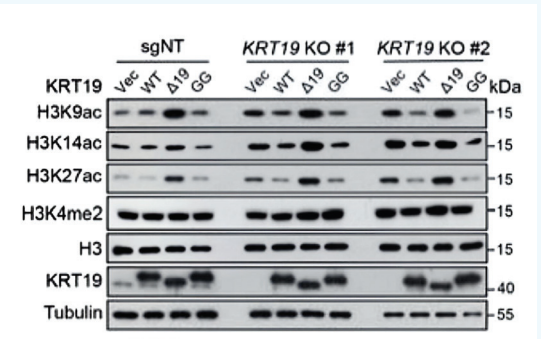
PMID: 38557414 IF: 12.9

期刊：Hepatology. 2024 Apr 1.

产品名称：Histone H3 (di methyl K4) rabbit pAb | R1110-3

应用：WB

科研单位：浙江大学



Normalized reads distribution profiles of KRT19 and HDAC1 ChIP-seq from HepG2 cells spanning gene bodies. ChIP was done in duplicates.

