In The Name Of GOD

Types of cell death and its application in cancer treatment

Presented by: Niloufar Rezazadegan

Master Student Of Medical Immunology

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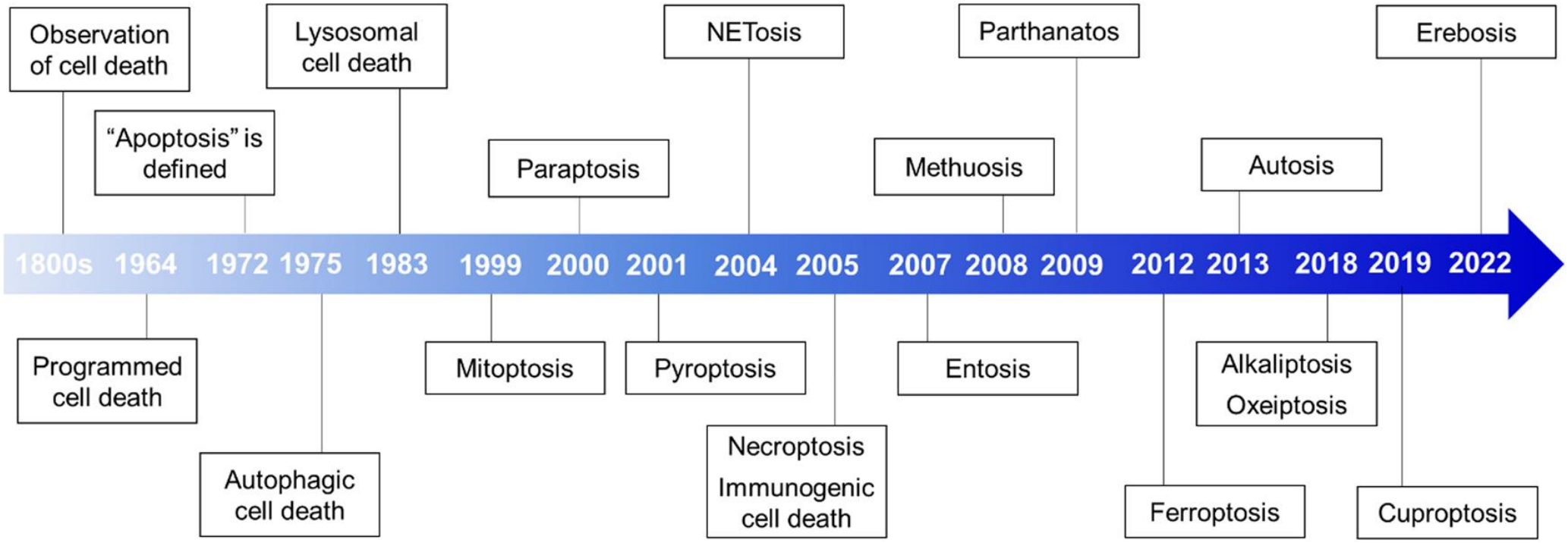
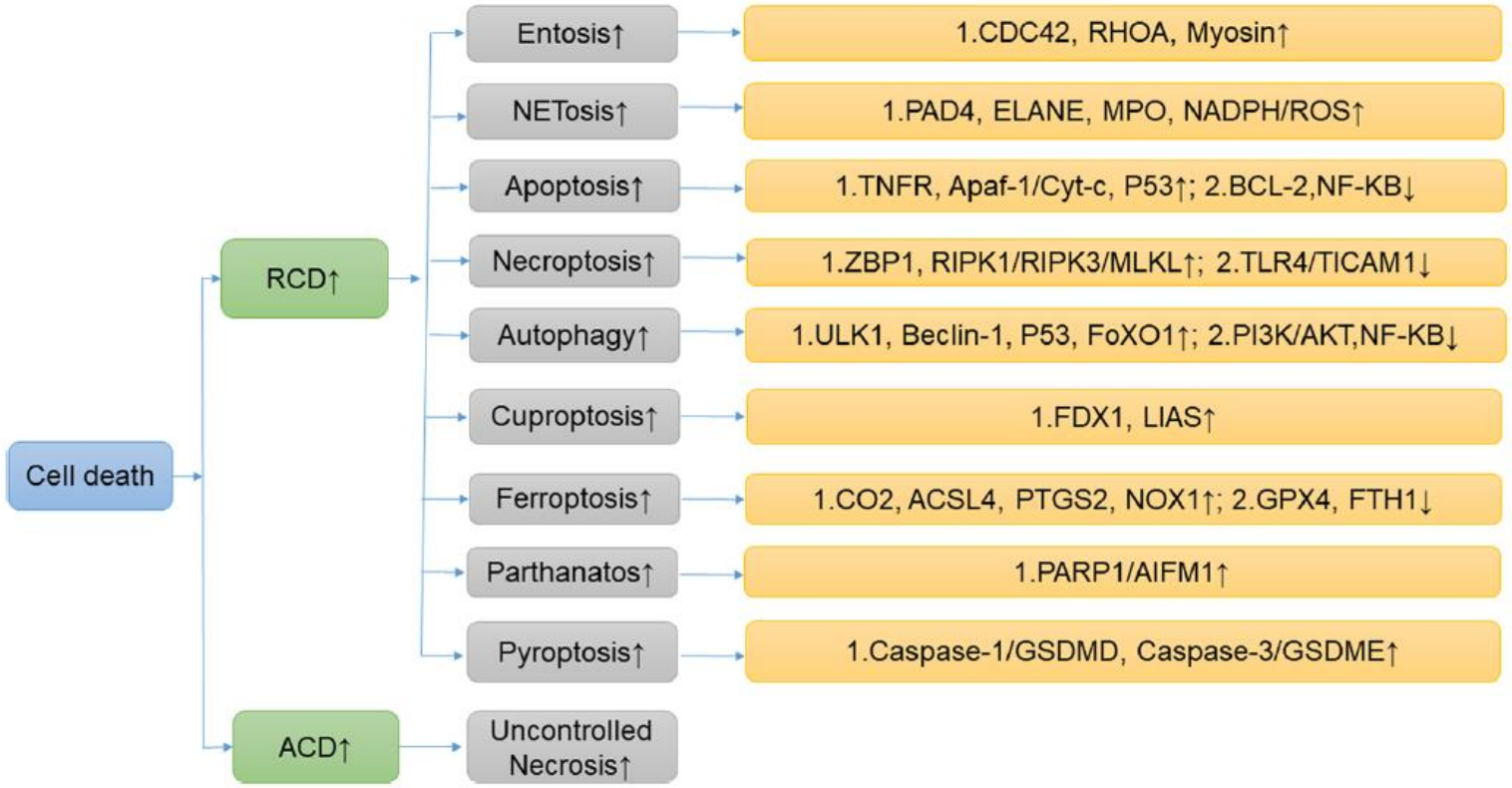
History



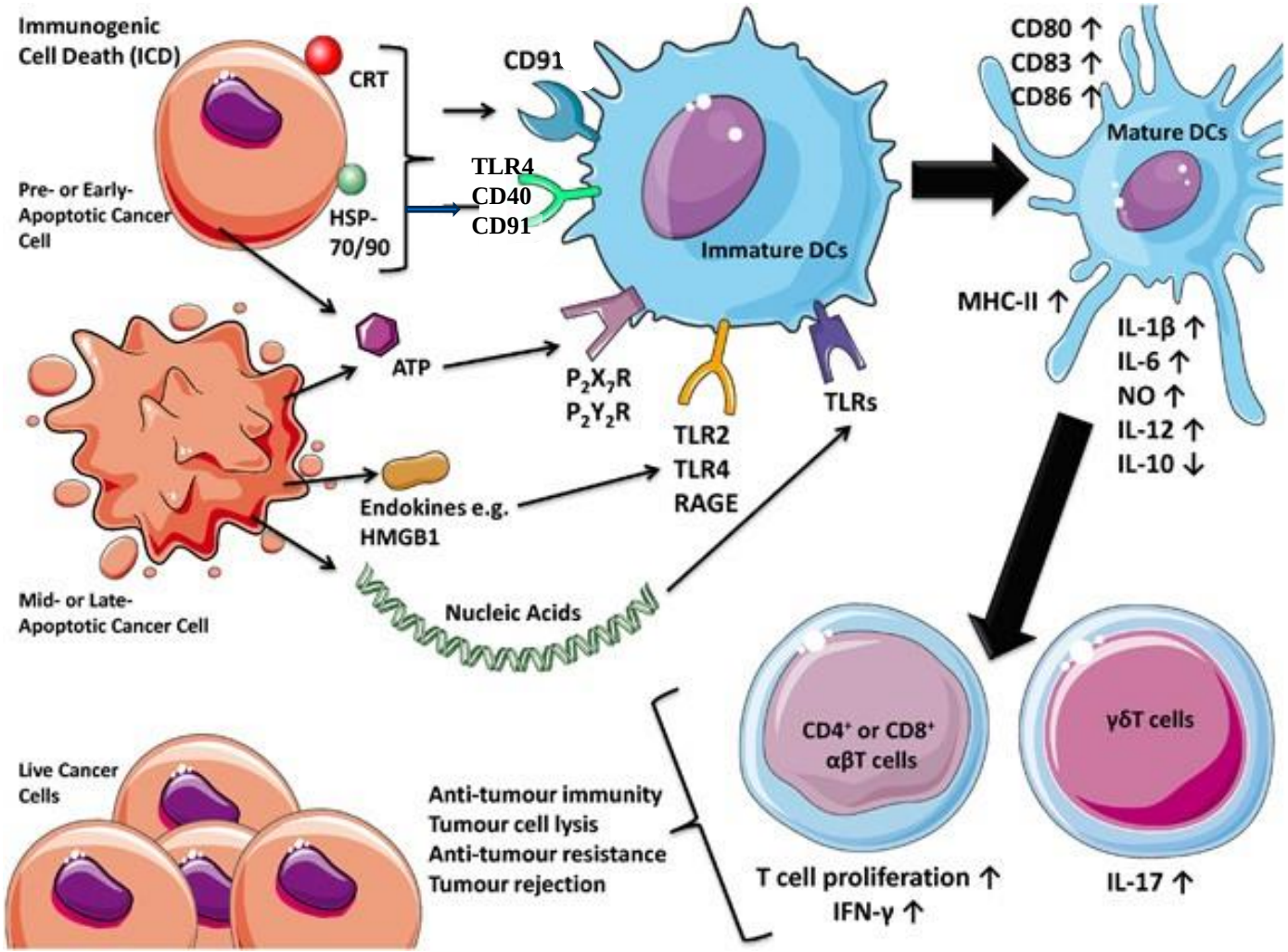
PARK. Experimental & Molecular Medicine, 2023

INTRODUCTION



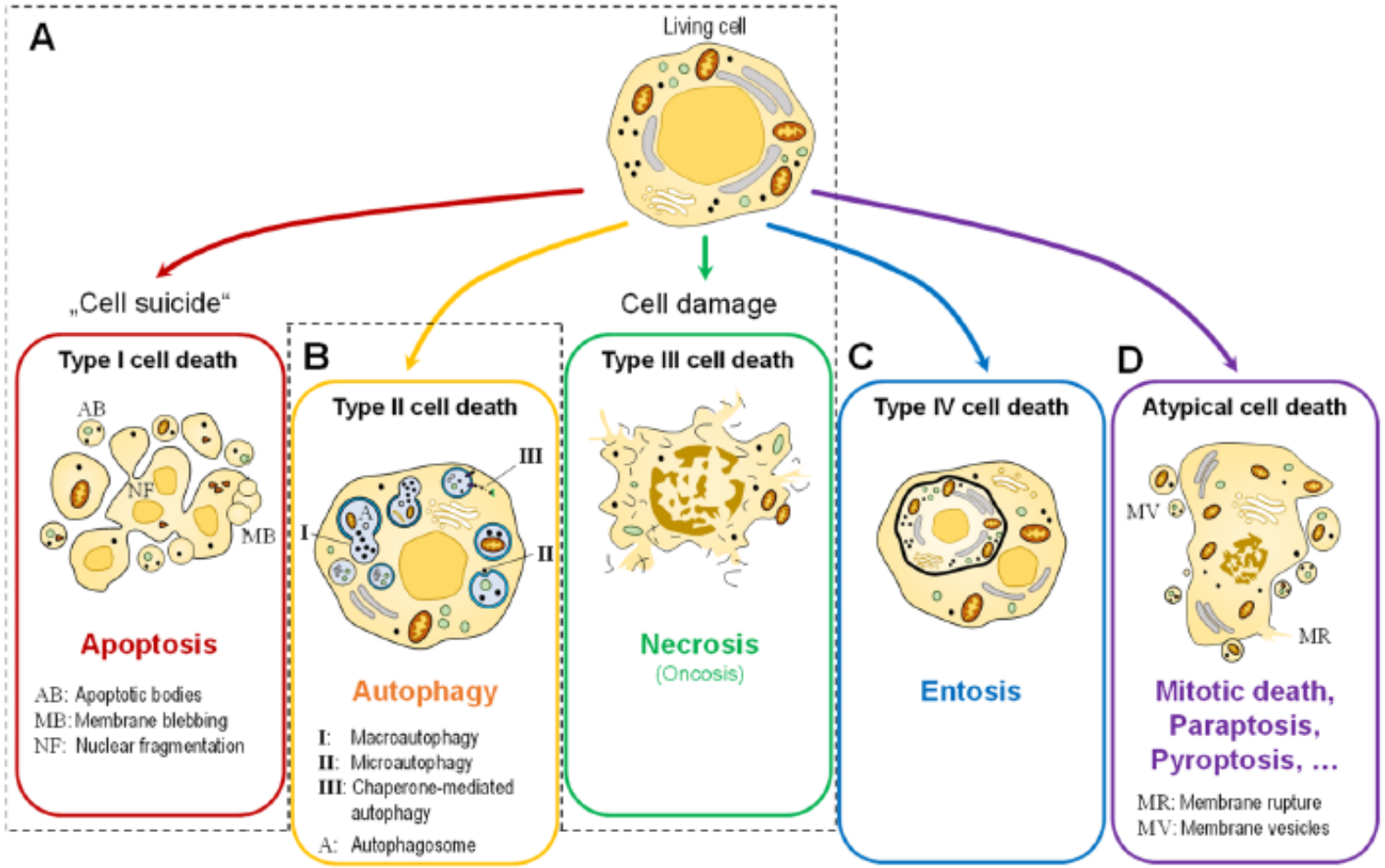
Di wang .Biomedicine & Pharmacotherapy . 2023

DAMPs



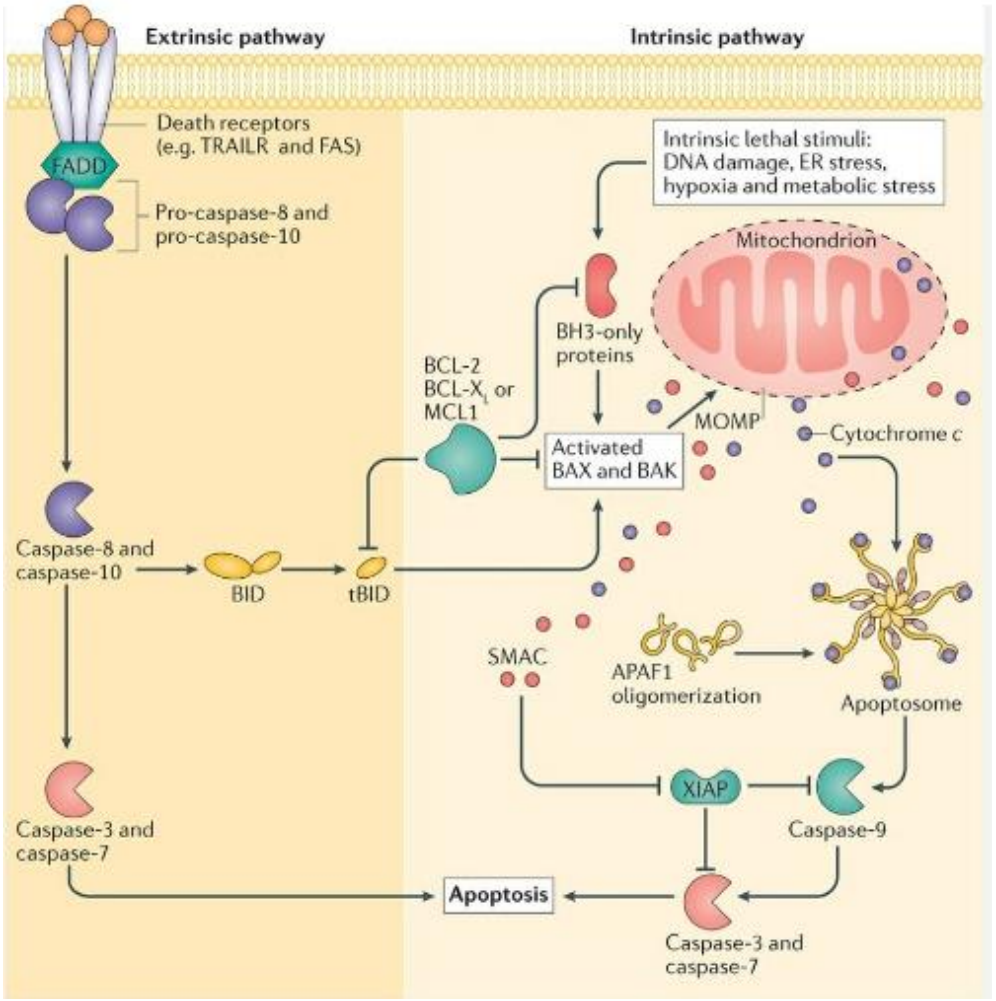
A D Garg, Cell Death & Differentiation. 2020

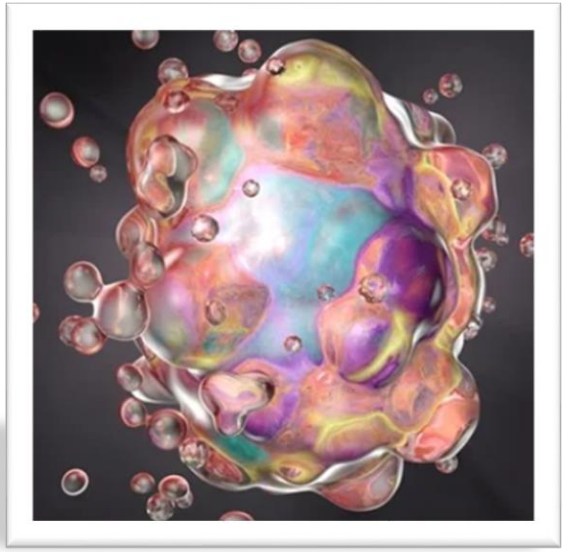
INTRODUCTION



Marcus Krüger. International Journal of Molecular Sciences, 2022

apoptosis

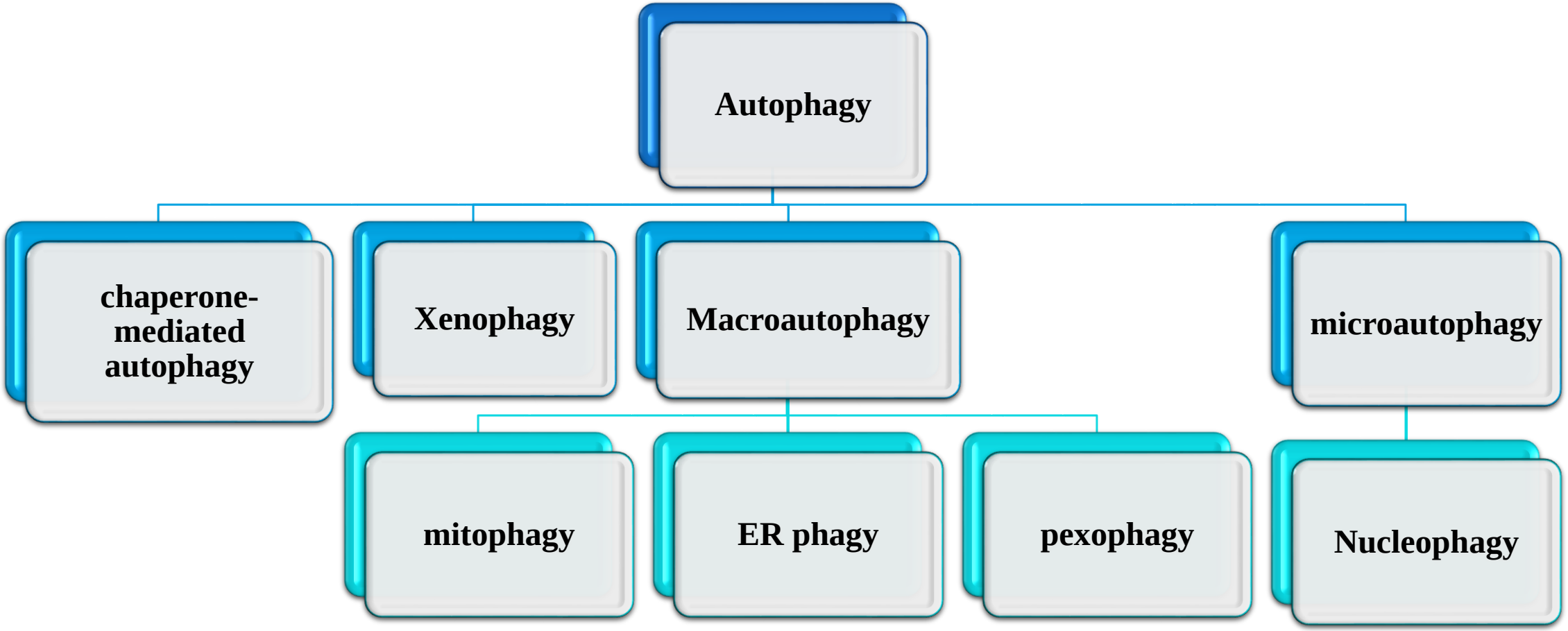




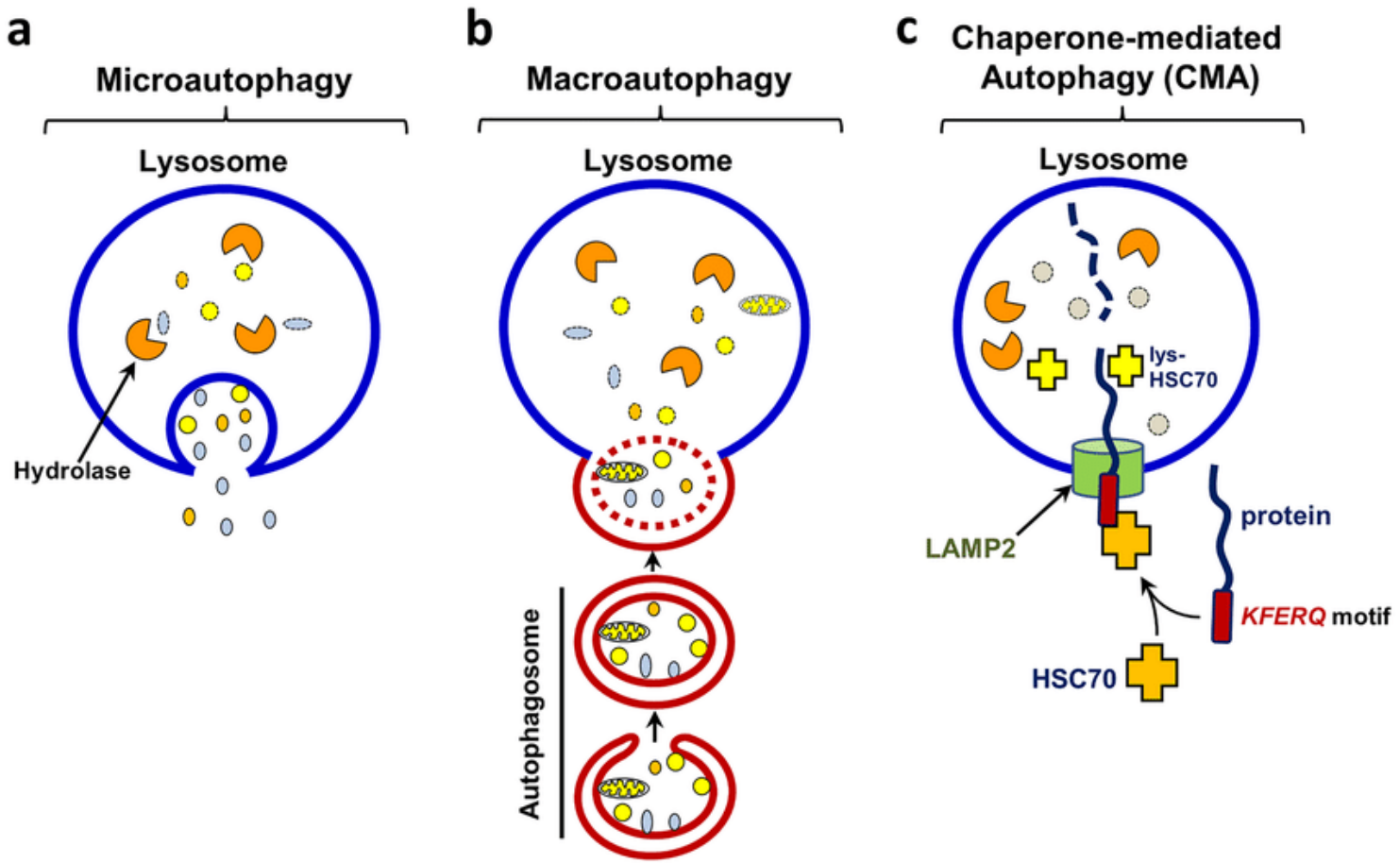
Major DAMPs

HMGB1, histones,
exRNAs, cfDNA
ATP

Autophagy

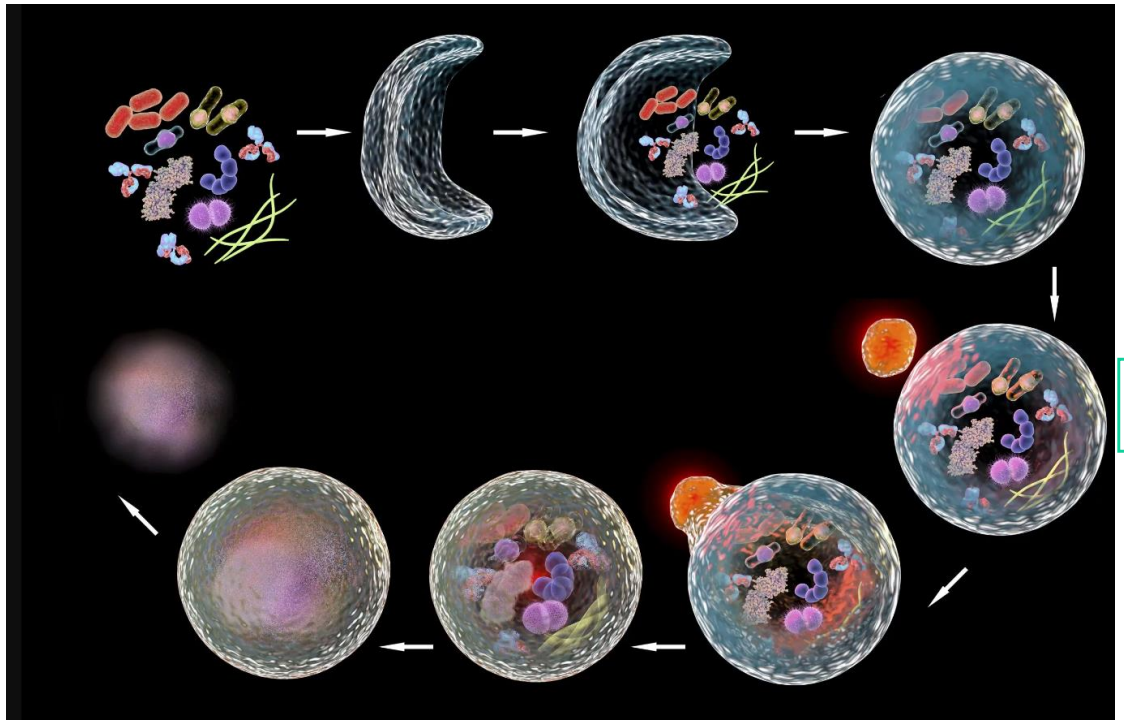

Autophagy
chaperone-mediated autophagy
Xenophagy
Macroautophagy
microautophagy
mitophagy
ER phagy
pexophagy
Nucleophagy

Autophagy



SAIKIA. Journal of Molecular Medicine, 2021

Autophagy



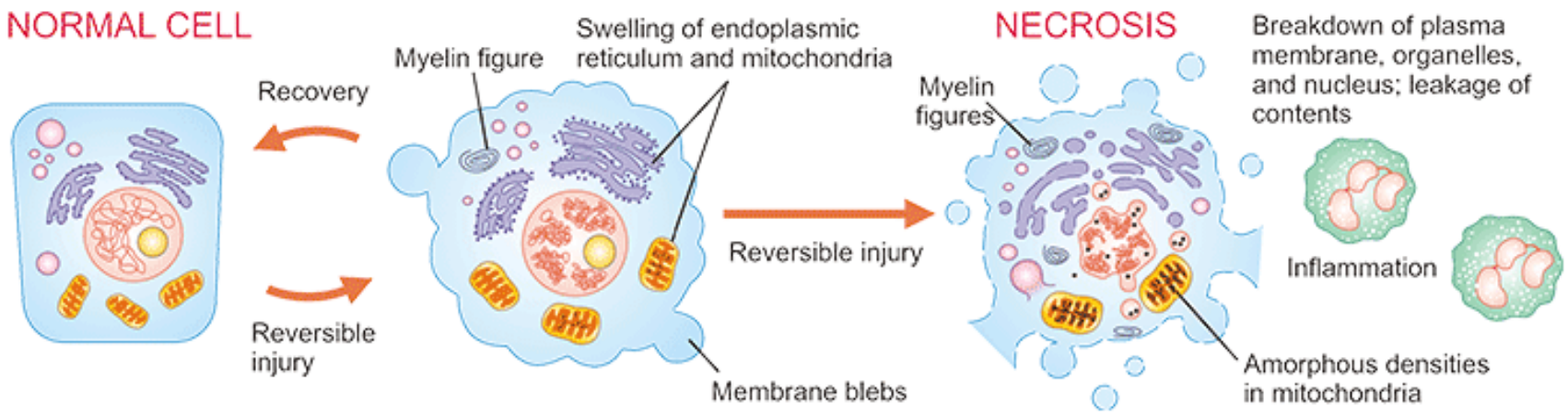
Major DAMPs

HMGB1, ATP,
RNA-binding
proteins
and small noncoding
RNAs

Dr. Paul Janssen.BLOG.November 2016

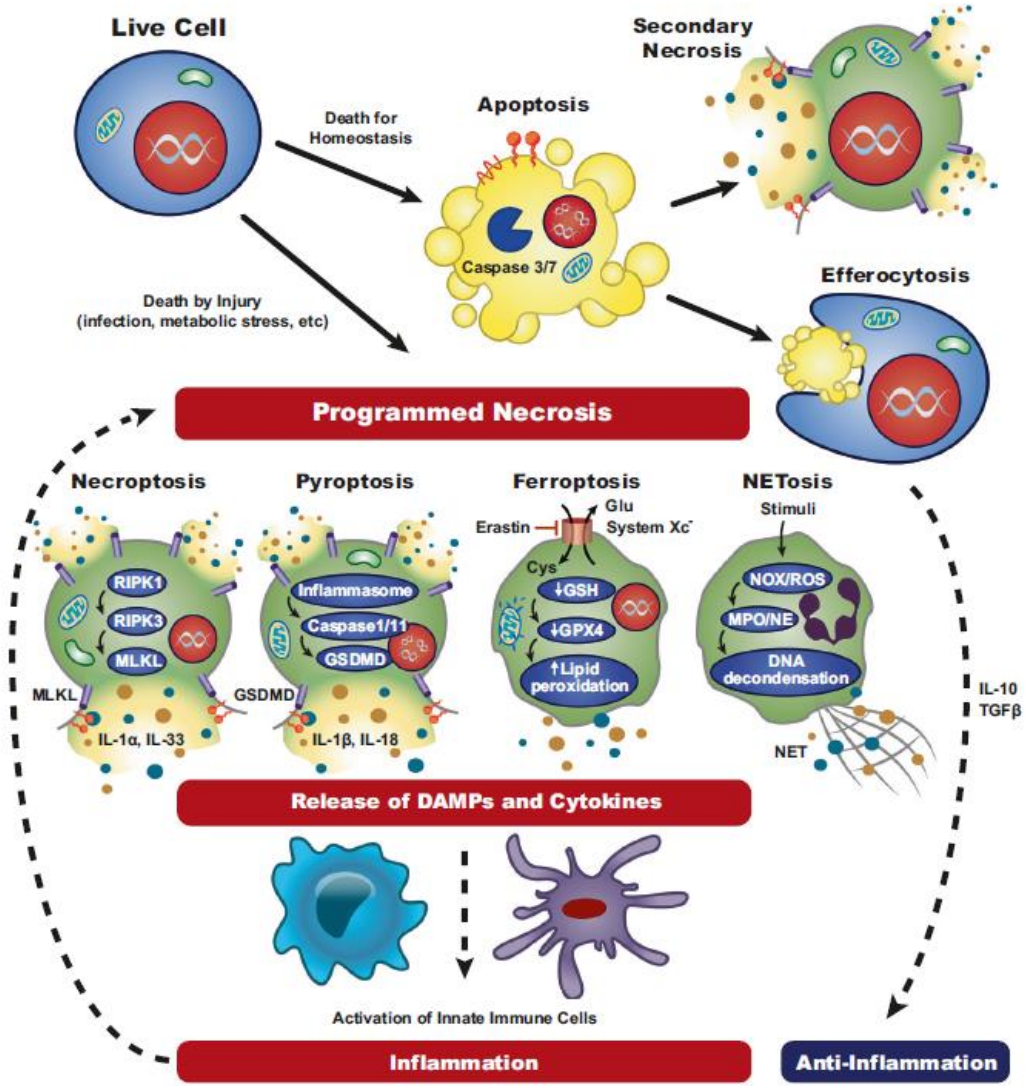
Necrosis

HMGB1, ATP, histones, HSPs, exRNAs, cfDNA



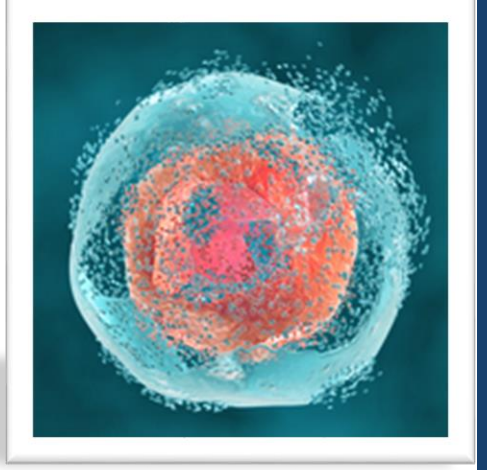
Get an Overview of Necrosis Research- CUSABIO

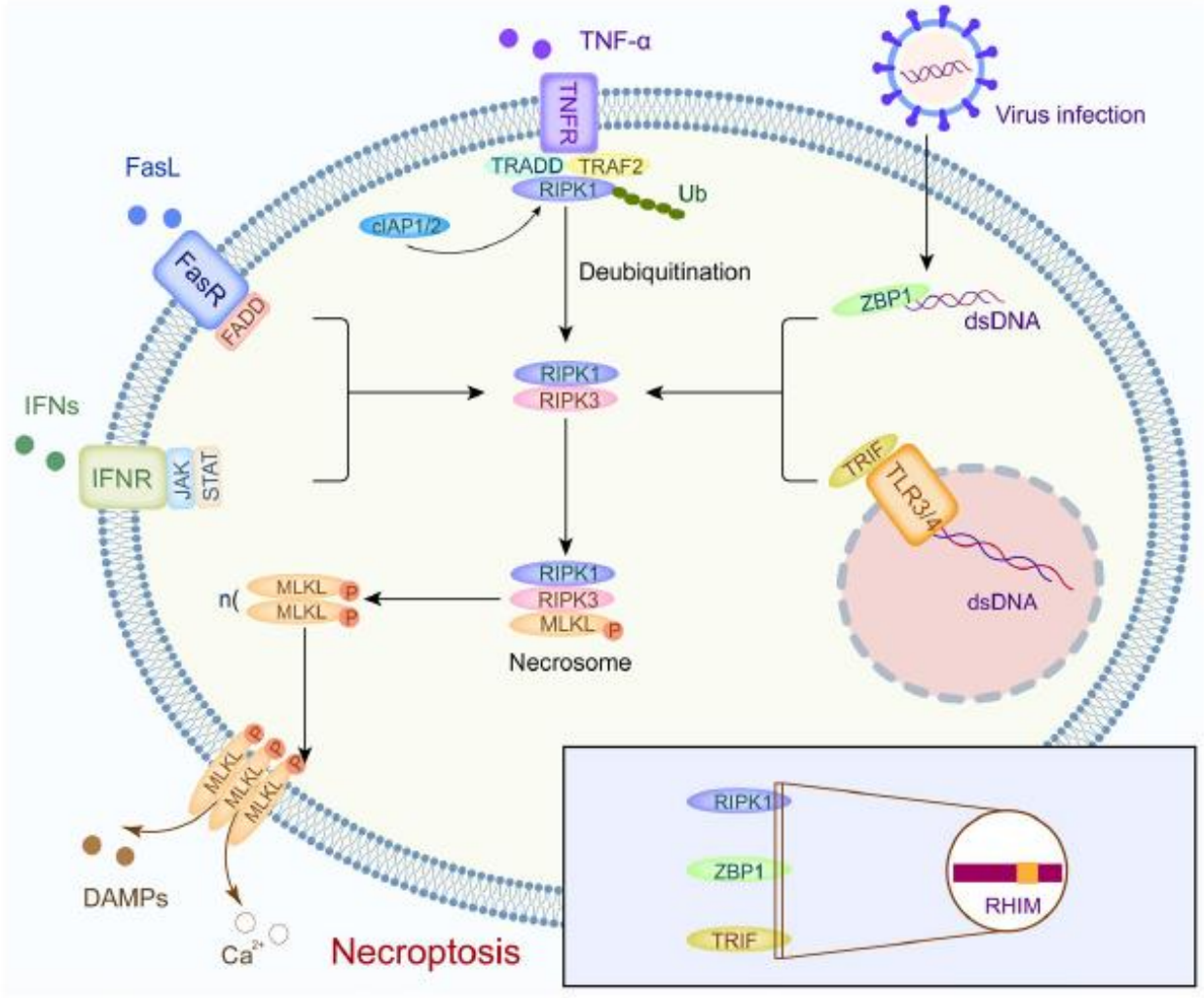
Programmed Necrosis



KIM. Cell Death & Differentiation (2019)

necroptosis

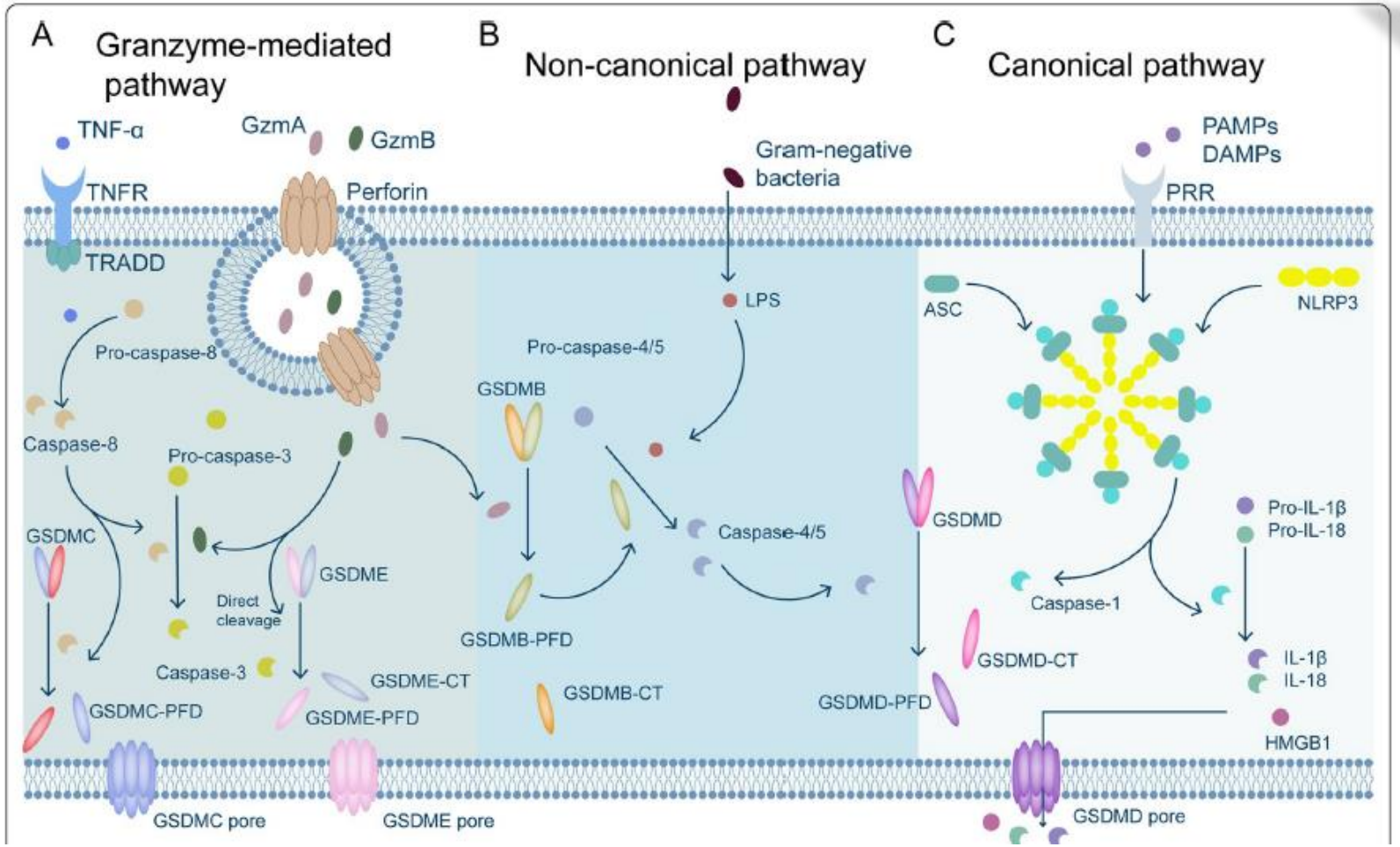




HMGB1, nucleic acids, IL-1, ATP, uric acid, and S100 protein, HSP, IL-33

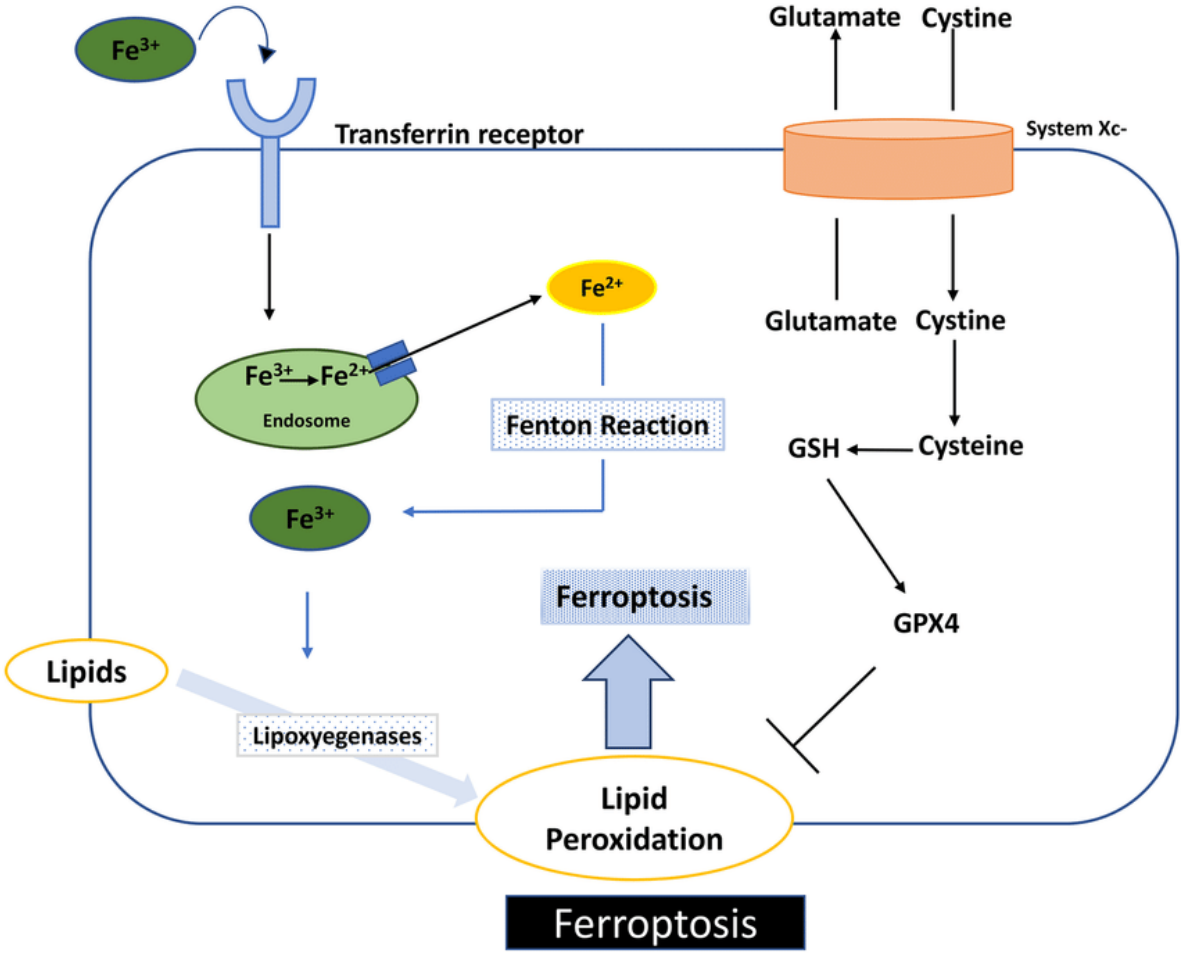
Xuhui Tong. Journal of Hematology & Oncology. 2022

Pyroptosis



Xuhui Tong. Journal of Hematology & Oncology. 2022

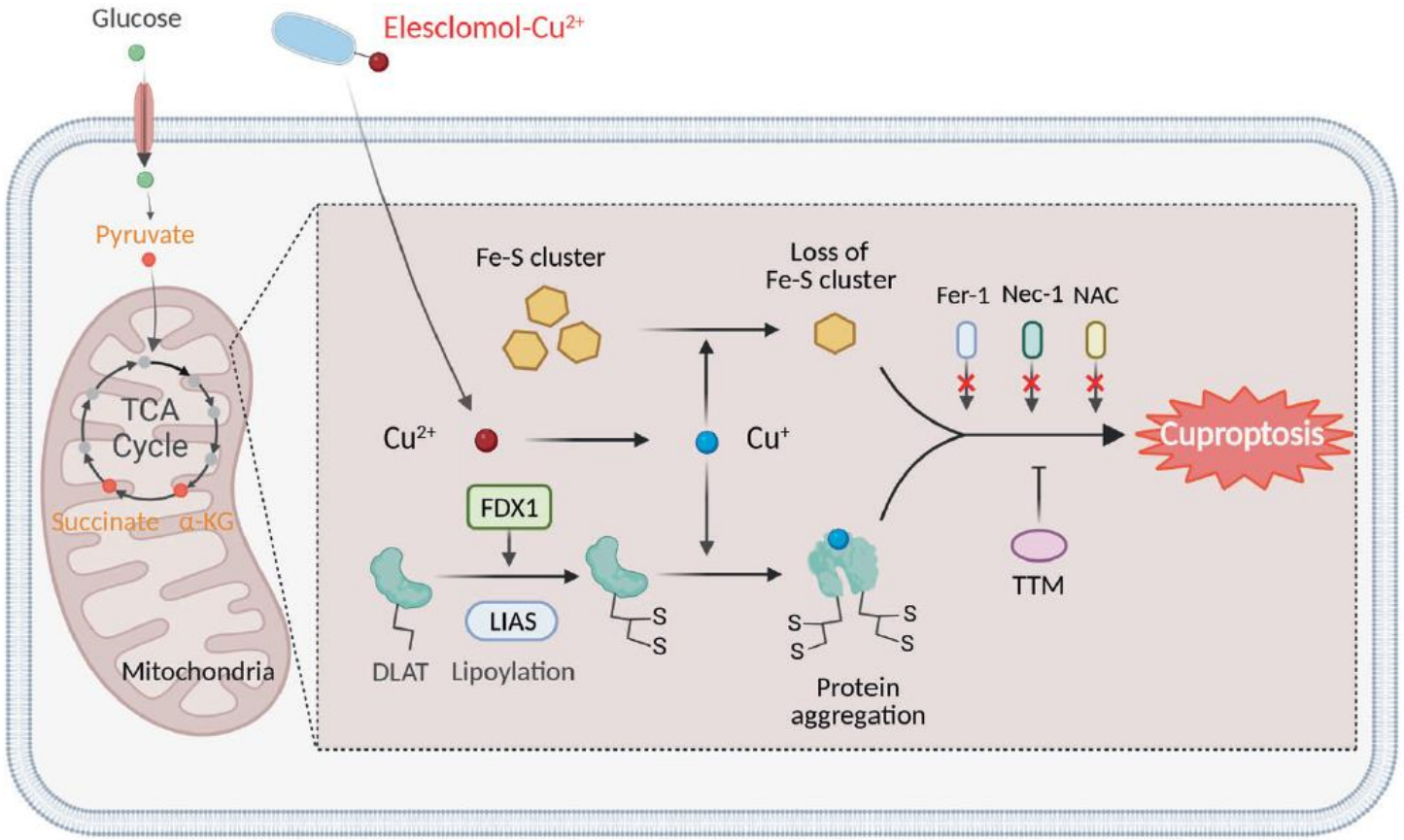
Ferroptosis

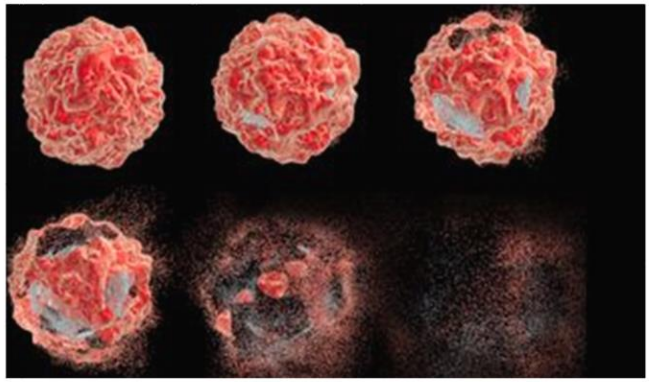


HMGB1, IL-33
cfDNA,

Qamar Zia. Molecular Biology Reports .2021

cuproptosis

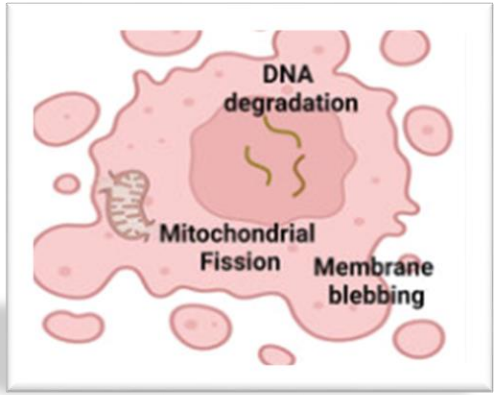


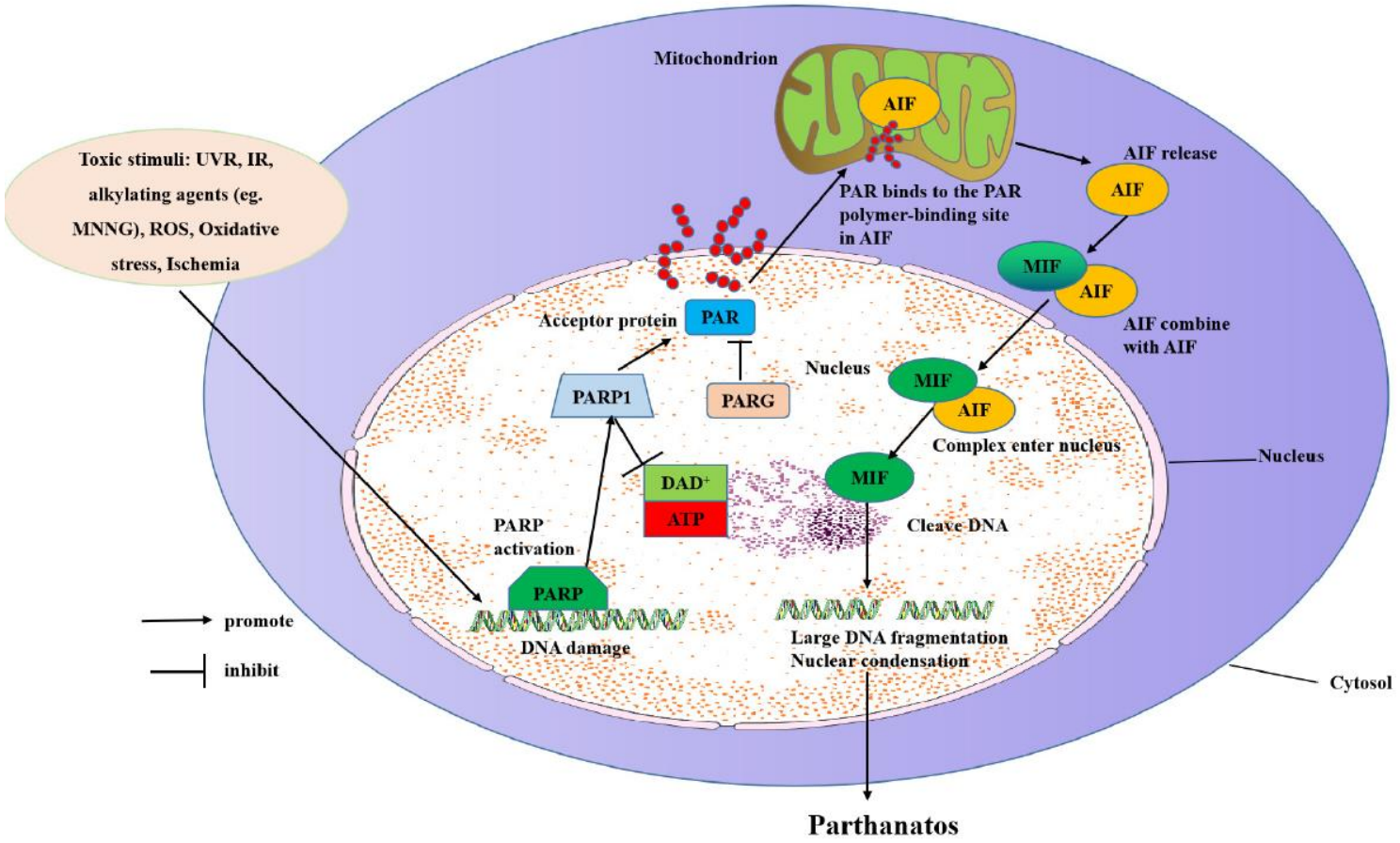


HMGB1

Liyun Chen. Signal Transduction and Targeted Therapy. 2022

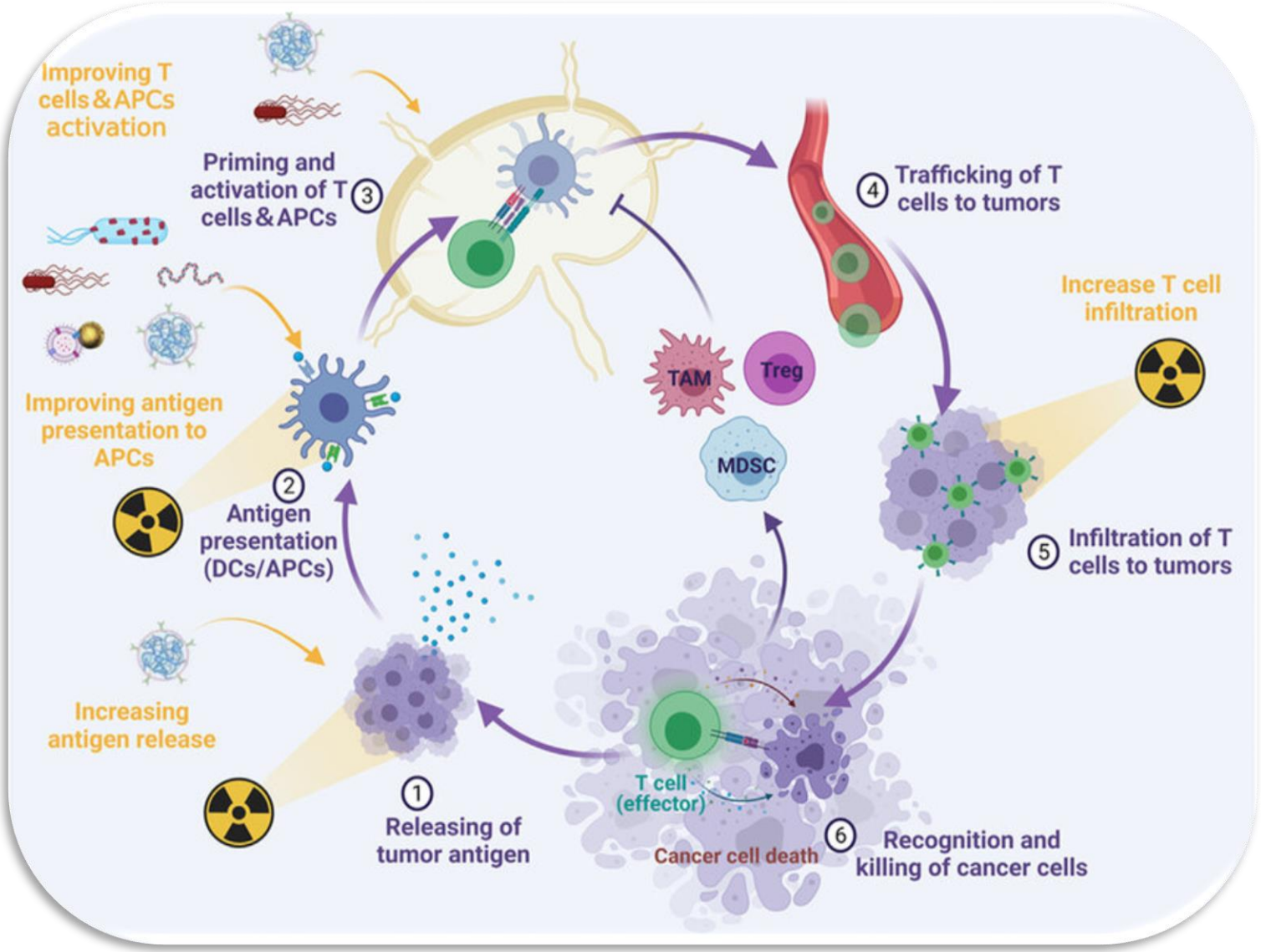
Parthanatos





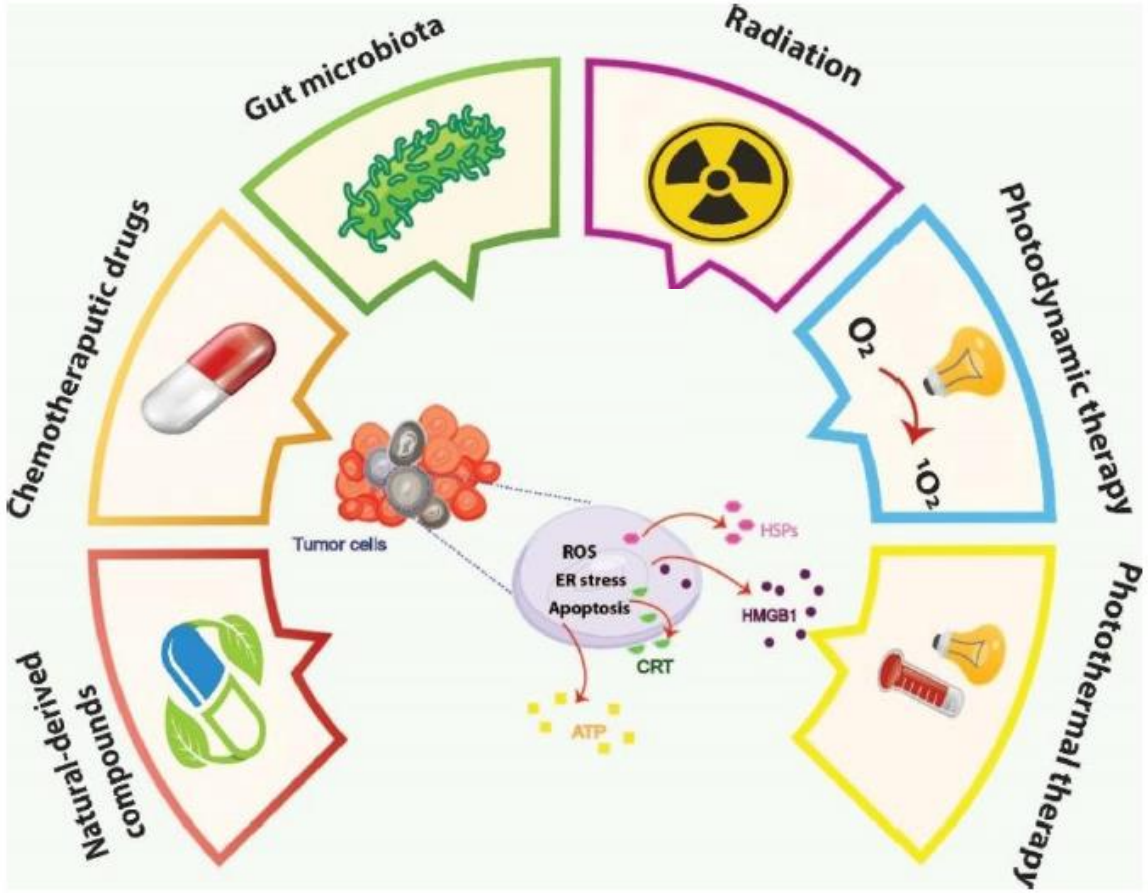
HMGB1

Ping Huang. International Journal of Molecular Sciences 2022



Yu Zhang.Acta Pharmaceutica Sinica B, 2023

immunogenic cell death inducers



Mina Amiri. Cancer Cell International. 2023

natural agents

Curcumin

Silibinin

Shikonin

Resveratrol

Lentinan

Colchicine

Digoxin

scientific reports

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OPEN

Intensification of resveratrol cytotoxicity, pro-apoptosis, oxidant potentials in human colorectal carcinoma HCT-116 cells using zein nanoparticles

Maan T. Khayat[1], Mohamed A. Zarka[2], Dalia Farag. A. El-Telbany[3], Ali M. El-Halawany[4], Hussam Ibrahim Kutbi[5], Walid F. Elkhatib[6,7], Ayman M. Noreddin[8,9], Ahdab N. Khayyat[1], Rania Farag A. El-Telbany[10], Sherif F. Hammad[11,12], Ashraf B. Abdel-Naim[13], Ebtesam M. Alolayan[14] & Majid Mohammad Al-Sawahli[15,16]✉

Cancer Immunology, Immunotherapy (2023) 72:3279–3292
https://doi.org/10.1007/s00262-023-03487-3

RESEARCH

Piper nigrum extract suppresses tumor growth and enhances the antitumor immune response in murine models of breast cancer and melanoma

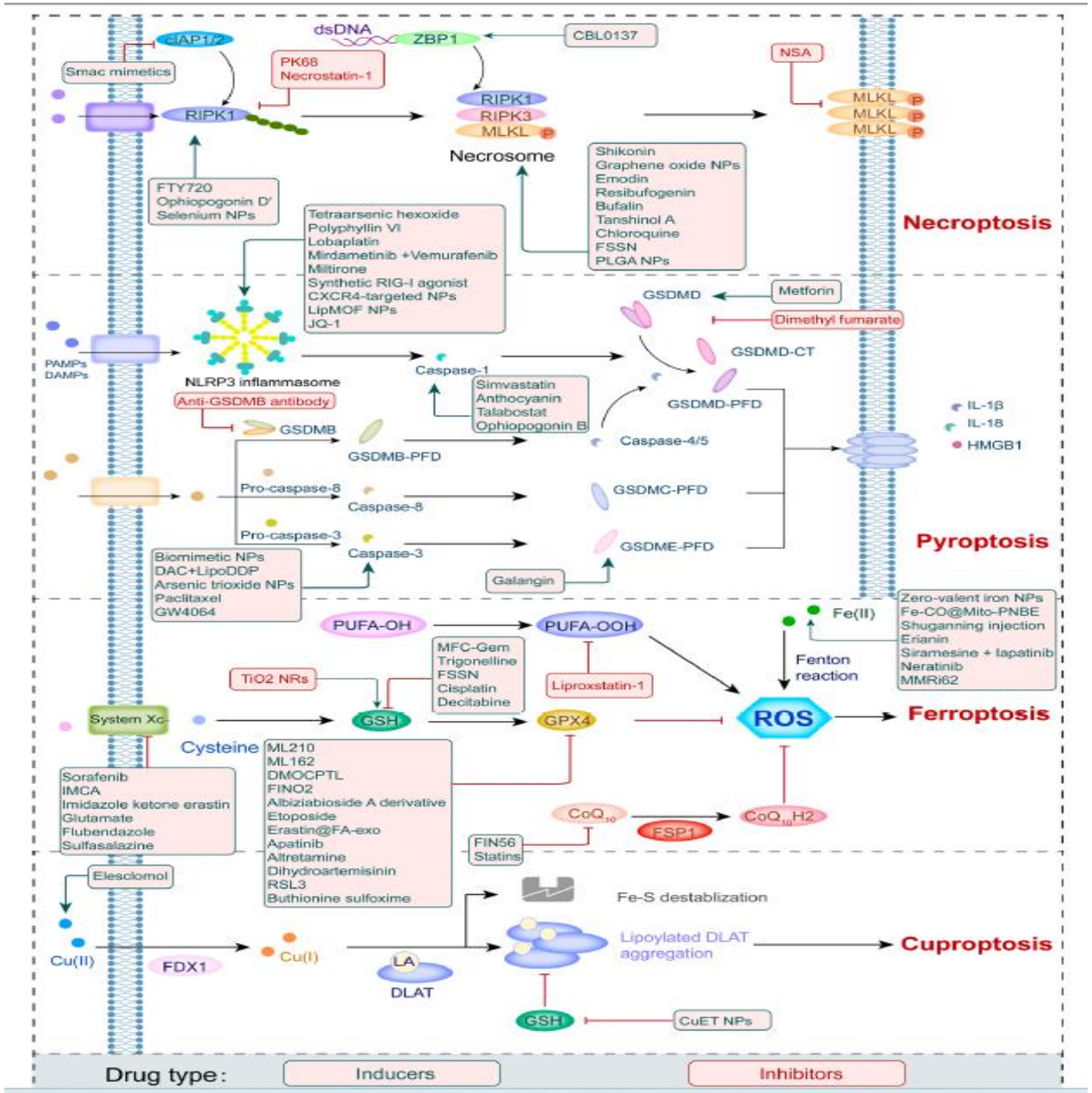
Paola Lasso[1] · Laura Rojas[1] · Cindy Arévalo[1] · Claudia Urueña[1] · Natalia Murillo[1] · Paula Nossa[1] · Tito Sandoval[1] · Luis Carlos Chitiva[2] · Alfonso Barreto[1] · Geison M. Costa[2] · Susana Fiorentino[1]

Chemotherapy drugs

Class	Chemotherapeutic	Biological function
Anti-metabolites	5-Fluorouracil	Pyrimidine nucleoside analog which inhibits RNA/DNA synthesis
	Gemcitibine	
	Methotrexate	Inhibitor of dihydrofolate reductase required for DNA synthesis
Alkylating agents	Cyclophosphamide	Disrupt DNA replication by adding alkyl groups to DNA
	Dacarbazine	
	Melphalan	
	Trabectedin	
	Temozolomide	
Anthracyclines	Doxorubicin	Disrupt DNA synthesis through intercalating base pairs
	Daunorubicin	
	Mitoxantrone	
Microtubule-targeting agents	Vinblastine	Disrupt microtubule assembly causing M-phase cell cycle arrest
Microtubule-targeting agents: Taxanes	Paclitaxel	Disrupt mitosis through stabilizing GDP-bound tubulin in microtubules
	Docetaxel	
Platinum compounds	Carboplatin	Disrupt DNA replication through cross-linking DNA strands
	Cisplatin	
	Oxaliplatin	
Topoisomerase inhibitors	Irinotecan	Interfere with type I topoisomerases to cause DNA strand breaks resulting in apoptosis
	Etoposide	Interfere with type II topoisomerases to cause DNA strand breaks resulting in apoptosis

Opzoomer Frontiers in Immunology. 2019

Summary of the modulators of novel RCDs in cancer treatment



Xuhui Tong. Journal of Hematology & Oncology. 2022

Journal of Controlled Release 357 (2023) 531–544

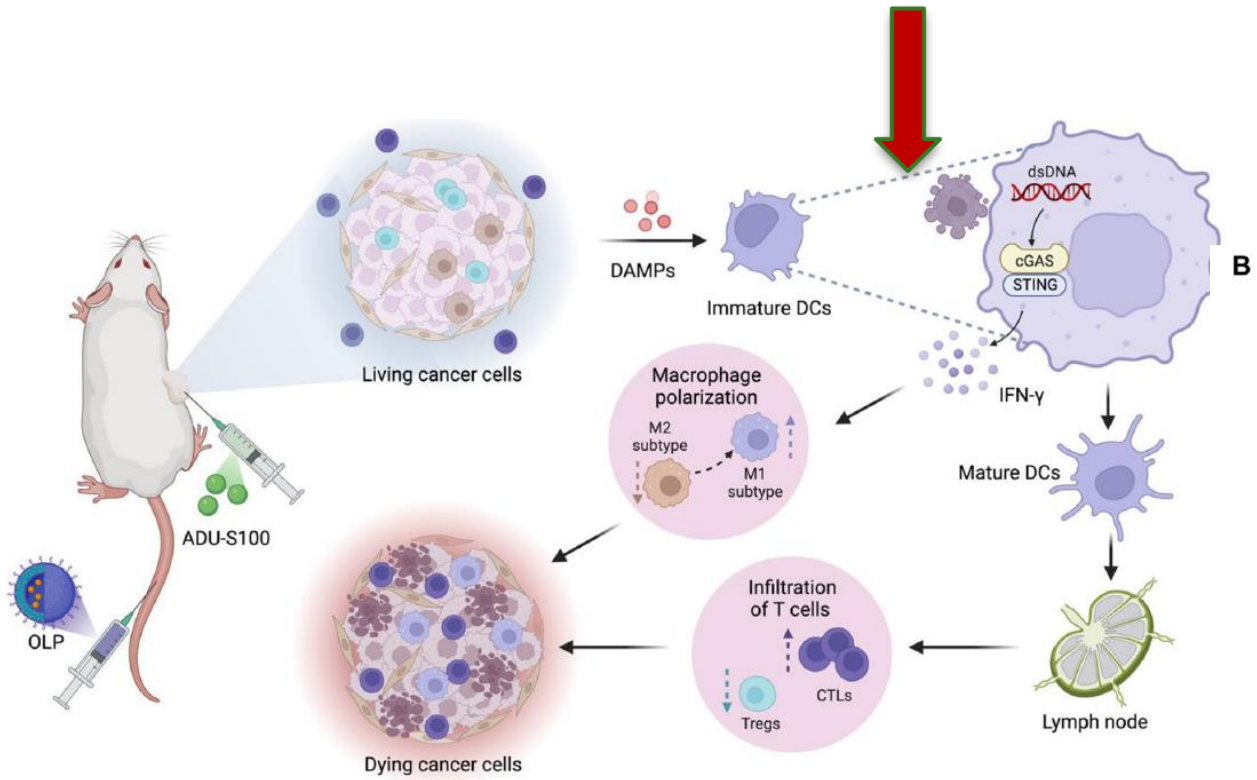
Contents lists available at ScienceDirect

Journal of Controlled Release

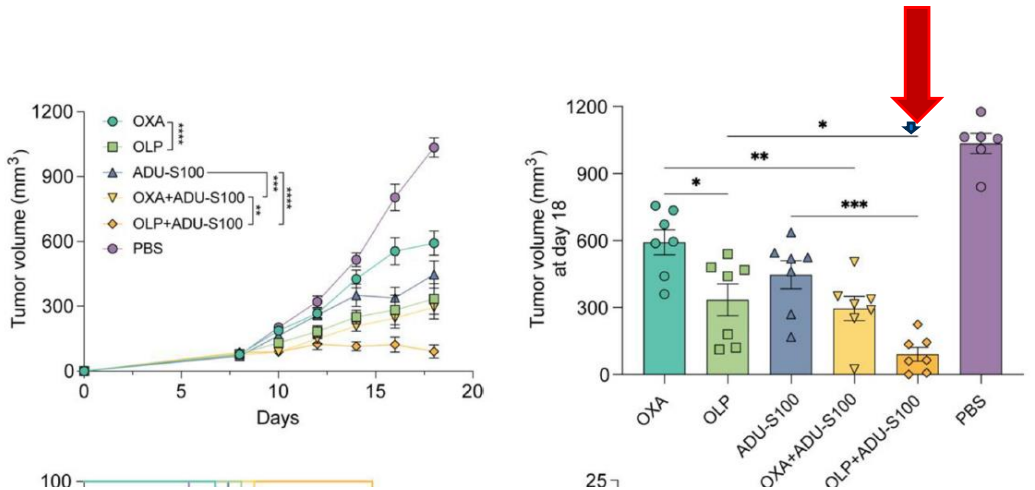
journal homepage: www.elsevier.com/locate/jconrel

Enhancing anti-tumor immunity through liposomal oxaliplatin and localized immunotherapy *via* STING activation

Zili Gu [a], Yang Hao [a,b,c], Timo Schomann [a,d], Ferry Ossendorp [e], Peter ten Dijke [c,*], Luis J. Cruz [a,*]



B



OXA: oxaliplatin
OLP: oxaliplatin-loaded liposomes

Contents lists available at ScienceDirect

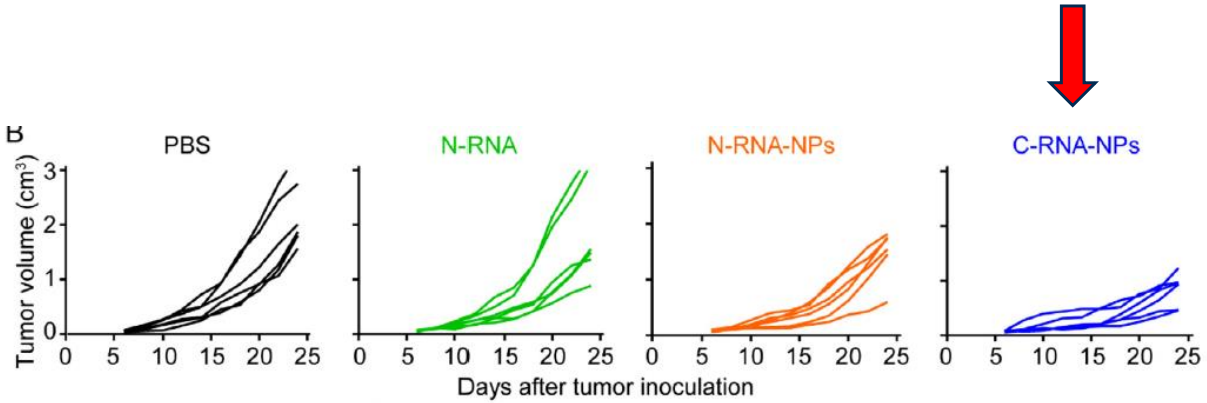
Acta Biomaterialia

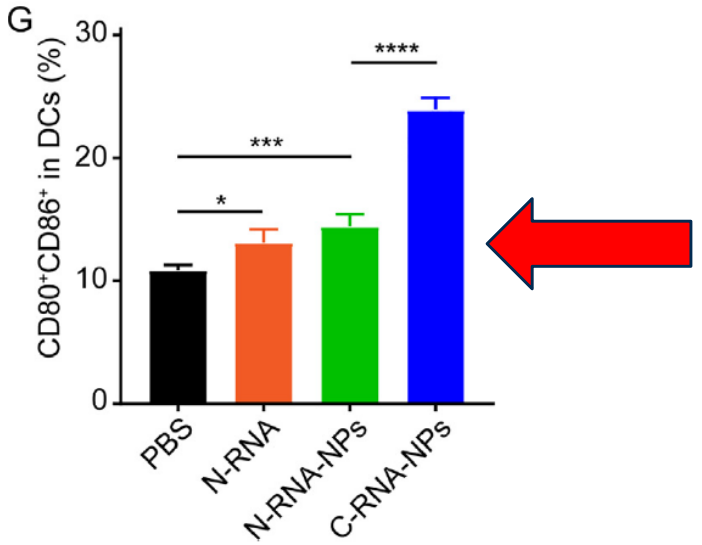
journal homepage: www.elsevier.com/locate/actbio

Full length article

Utilizing chemotherapy-induced tumor RNA nanoparticles to improve cancer chemoimmunotherapy

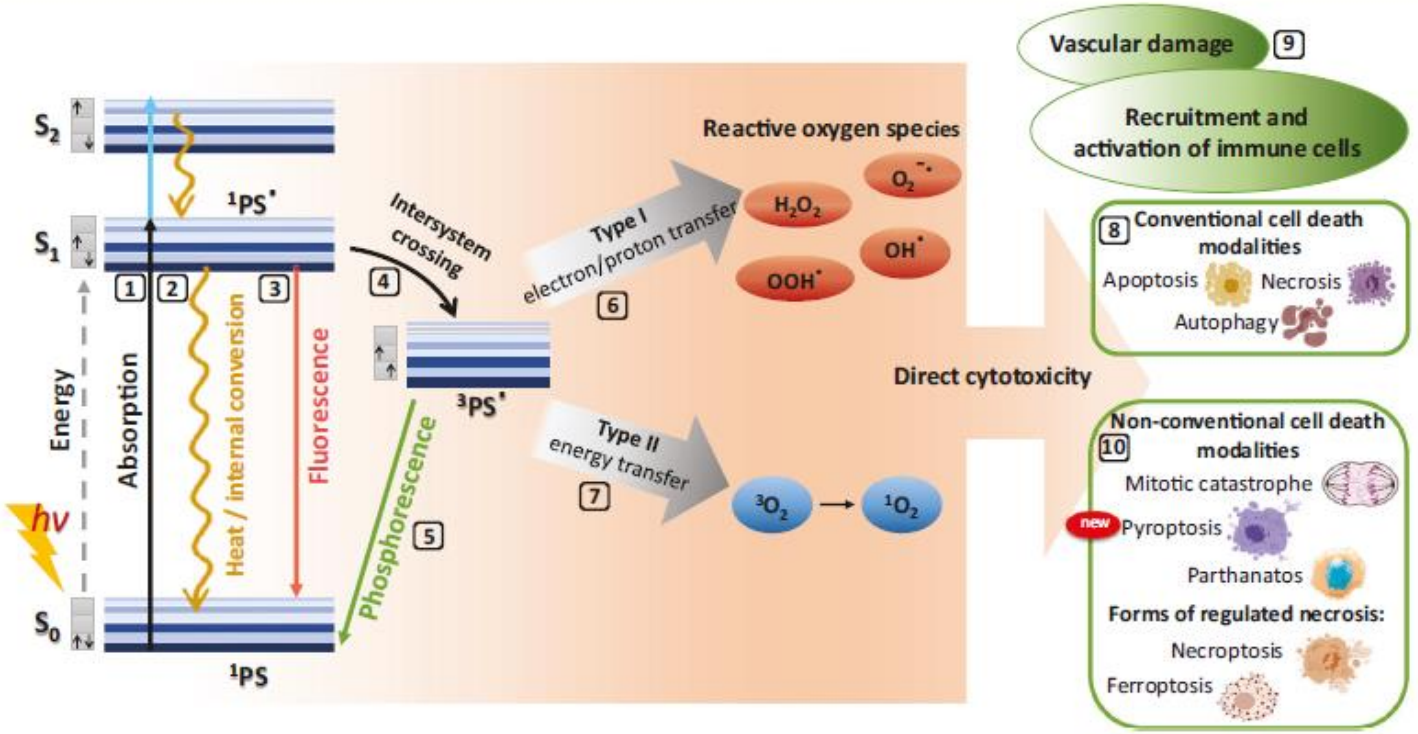
Lanhong Su[a], Wen Pan[a], Xiangxia Li[a], Xingyu Zhou[a], Xiaopeng Ma[b,*], Yuanzeng Min[a,b,c,**]





N-RNA: : noninduced tumor RNA
N-RNA-NP: noninduced tumor RNA nanoparticles
C-RNA-NP: chemotherapy-induced tumor RNA nanoparticles

photodynamic therapy



Tatiana Mishchenko. Cell death & disease, 2022

CDD press

www.nature.com/cddis

ARTICLE OPEN

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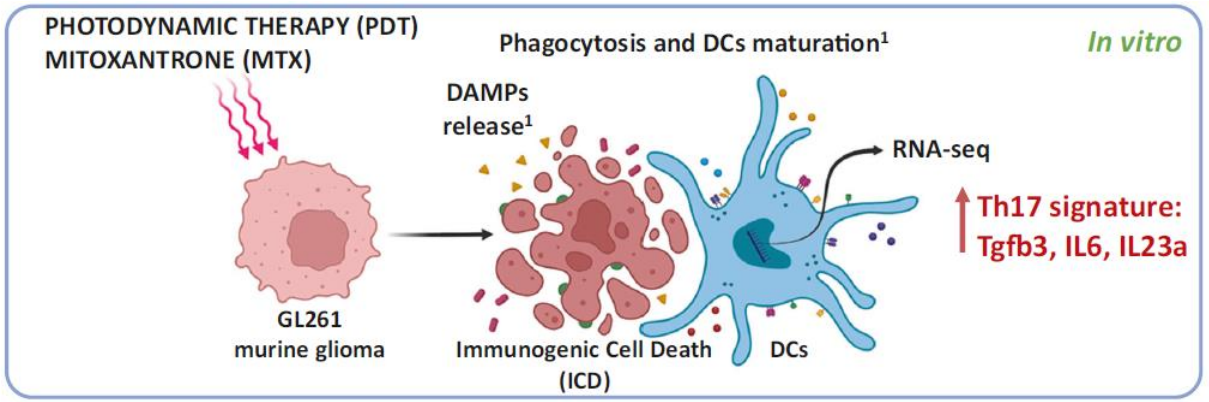
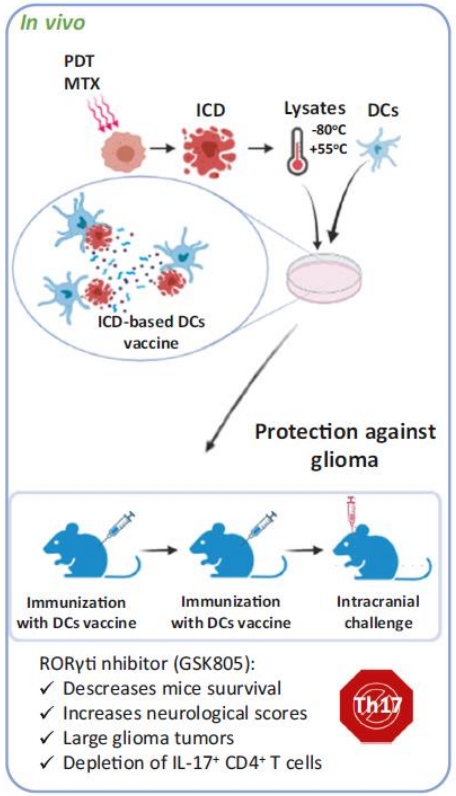
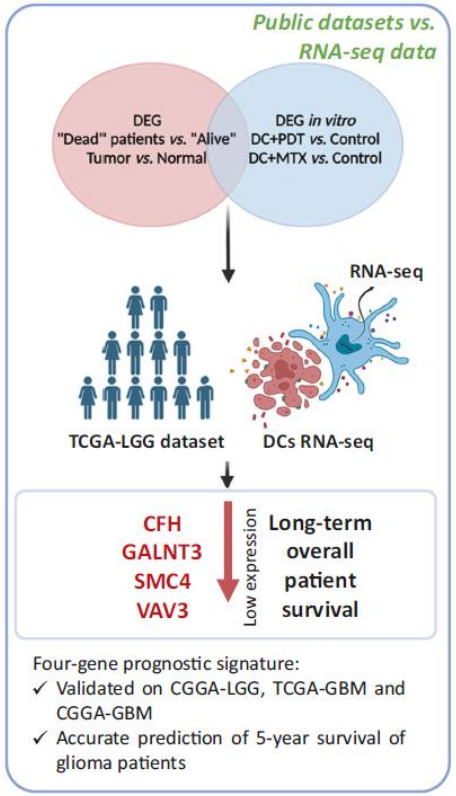
DC vaccines loaded with glioma cells killed by photodynamic therapy induce Th17 anti-tumor immunity and provide a four-gene signature for glioma prognosis

Maria Vedunova[1,13], Victoria Turubanova[1,2,13], Olga Vershinina[3], Maria Savyuk[1,2], Iuliia Efimova[2,4], Tatiana Mishchenko[1], Robrecht Raedt[5], Anne Vral[6], Christian Vanhove[7], Daria Korsakova[1], Claus Bachert[8], Frauke Coppieters[9], Patrizia Agostinis[10,11], Abhishek D. Garg[12], Mikhail Ivanchenko[3], Olga Krysko[2,14] and Dmitri V. Krysko[1,2,4,14]✉



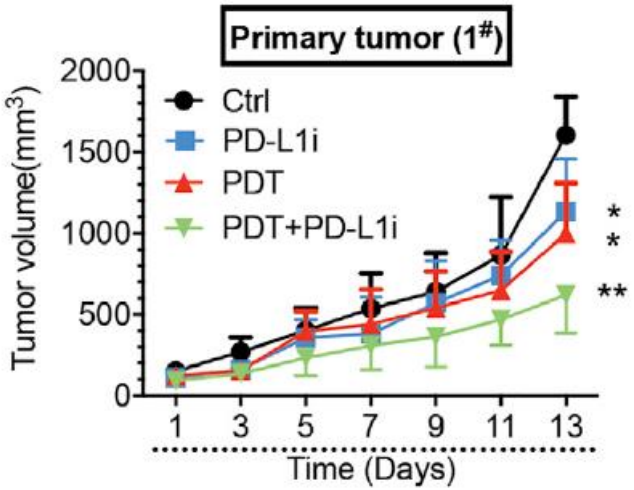


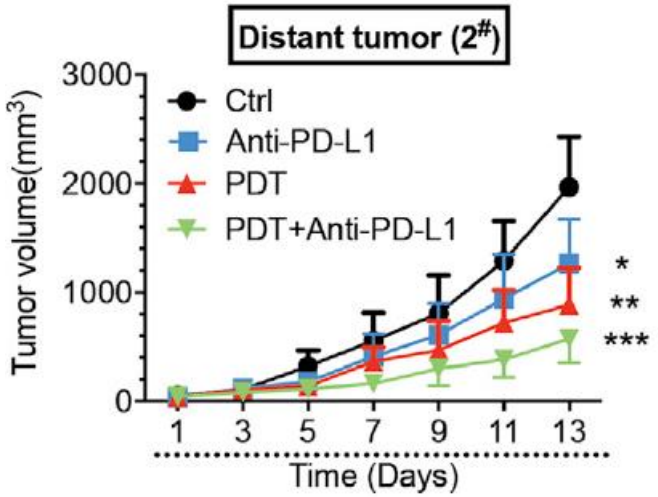


Molecular Therapy
Original Article

Photodynamic therapy synergizes with PD-L1 checkpoint blockade for immunotherapy of CRC by multifunctional nanoparticles

Zeting Yuan,[1,3,4,5] Guohua Fan,[1,3] Honglei Wu,[1,3,6] Chaolian Liu,[1,3,4] Yueping Zhan,[1,3] Yanyan Qiu,[1,3] Chenting Shou,[4] Feng Gao,[4] Jun Zhang,[7] Peihao Yin,[1,3,5,6] and Ke Xu[2,3,5,8]





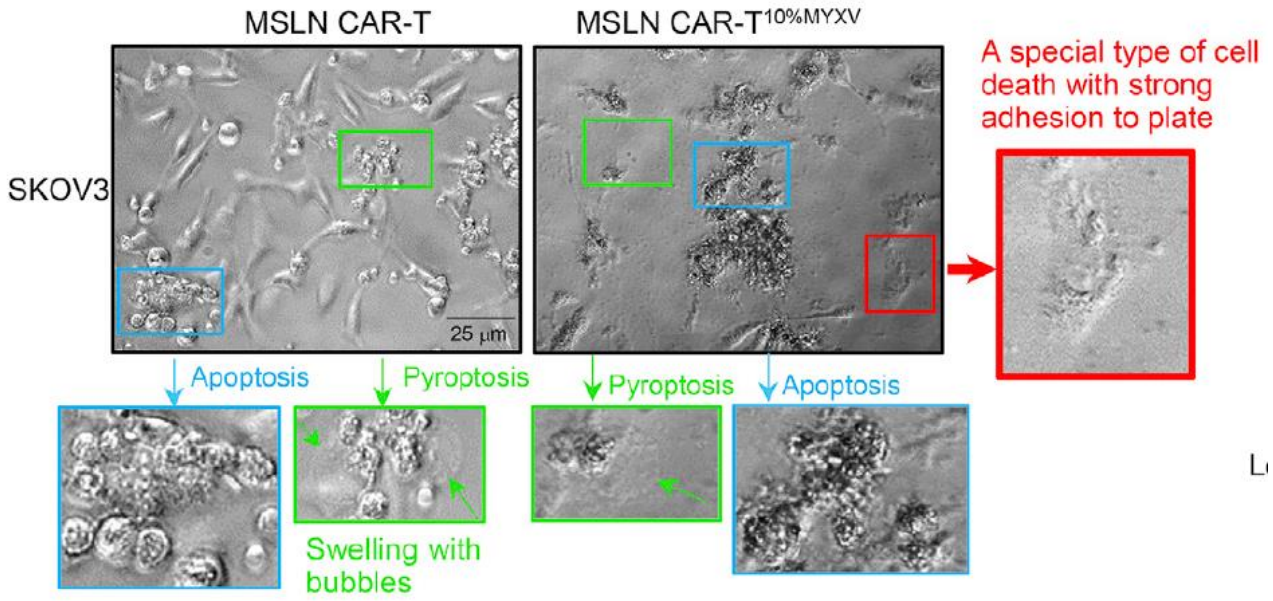
Cancer Cell

CellPress

Article

Induction of tumor cell autosis by myxoma virus-infected CAR-T and TCR-T cells to overcome primary and acquired resistance

Ningbo Zheng,[1] Jing Fang,[1,4] Gang Xue,[1] Ziyu Wang,[1,4] Xiaoyin Li,[2] Mengshi Zhou,[2] Guangxu Jin,[1] Masmudur M. Rahman,[3] Grant McFadden,[3,*] and Yong Lu[1,4,5,*]



Challenges

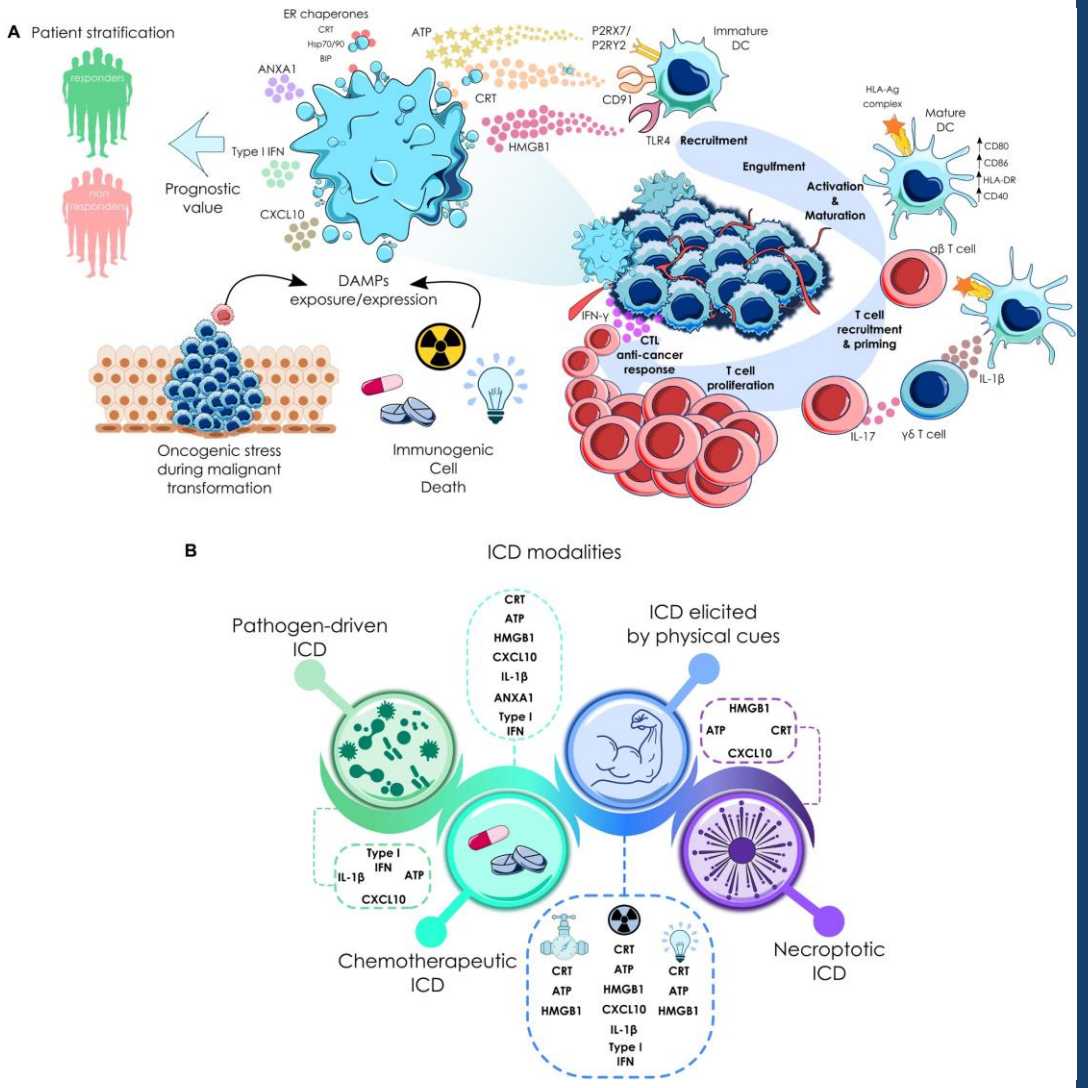
Tumor-Dependent ICD Resistance Mechanisms

chemotherapy may alter immune composition towards immune suppression.

side effects

Conclusion

- Induction of cell death is inexorably linked with cancer therapy
- There are different types of cell death that can be induced by different methods
- Choosing a suitable method to induce cell death is very important



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thank you!