The possible molecular mechanisms that *Schistosoma japonicum* soluble egg antigens restricts fibrosis

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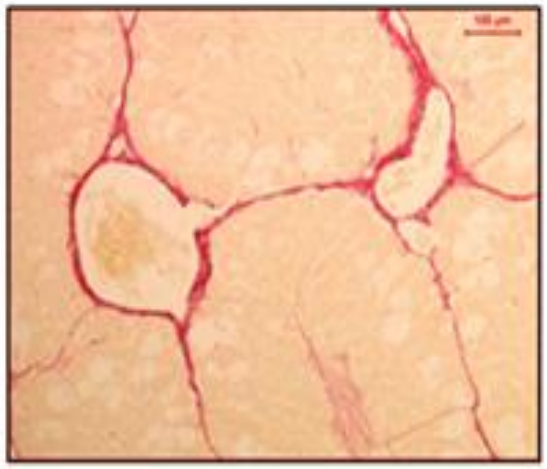
Parasitology-2015
International conference on
Parasitology

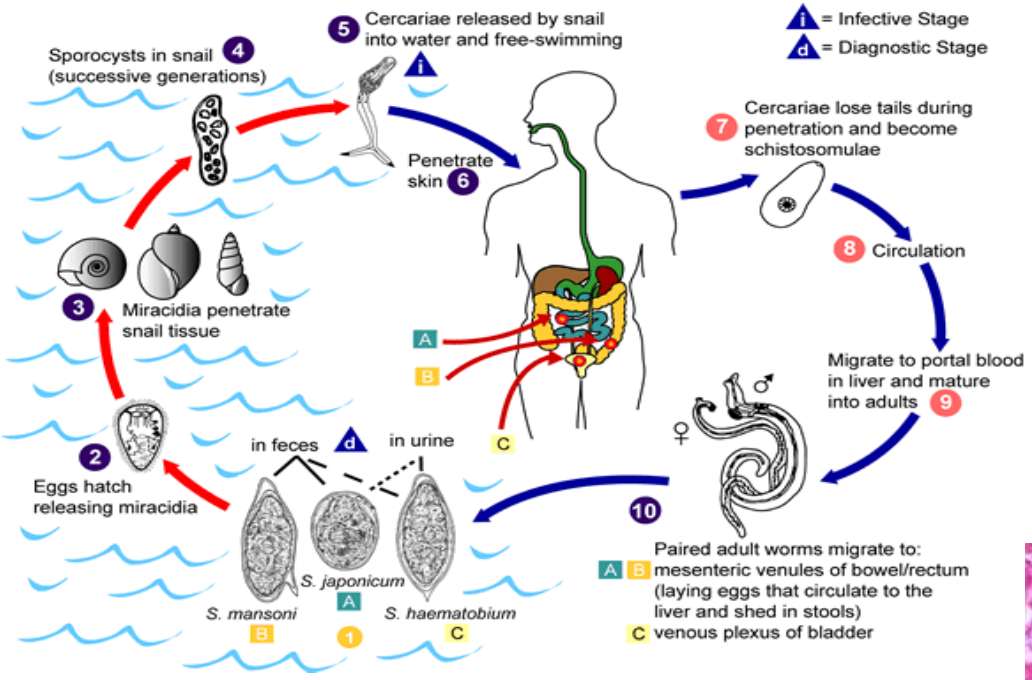
Hepatic fibrosis

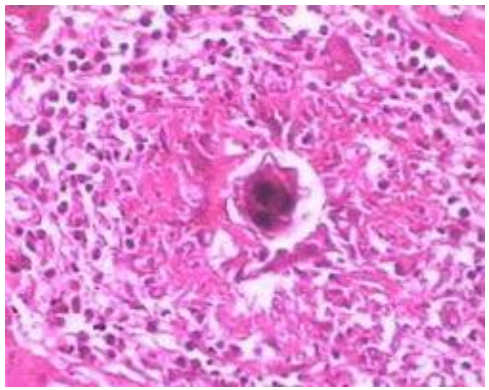
- Fibrosis, or scarring of the liver
- a wound-healing response
- a range of cell types and mediators
- induced by a variety of aetiological factors



Sirius red (x 5)

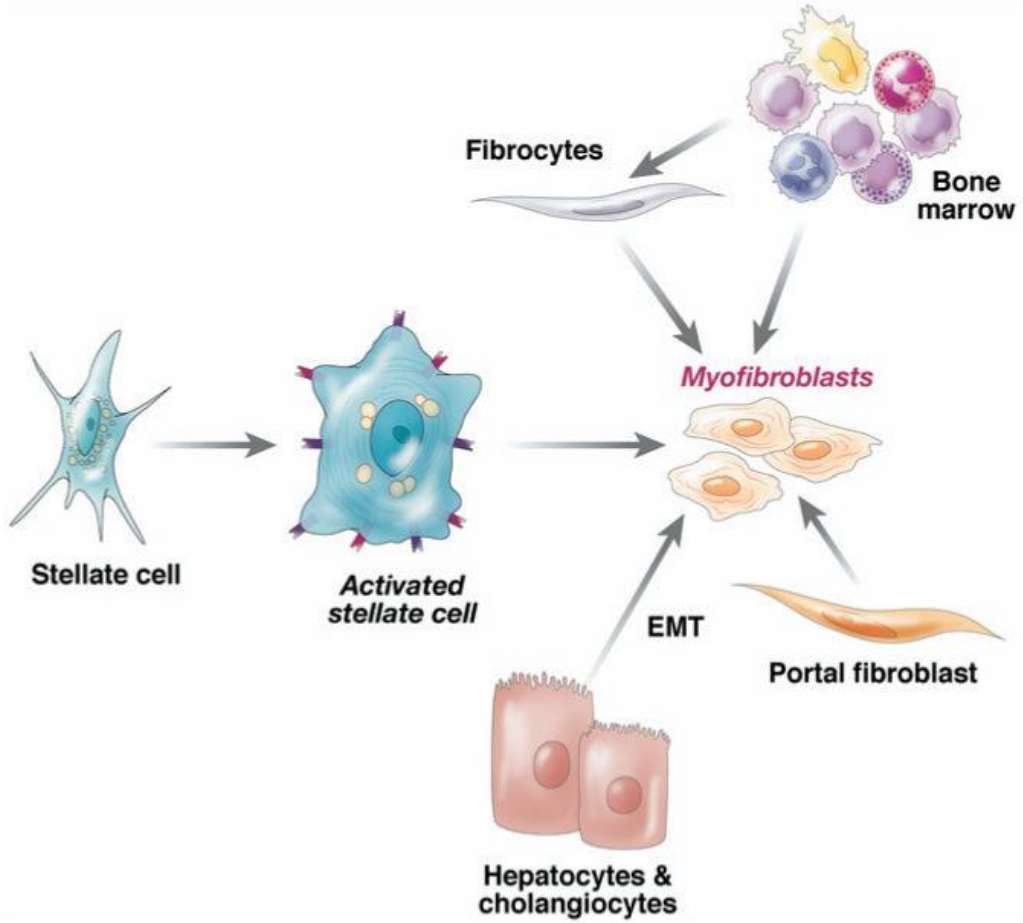
Schistosoma japonicum





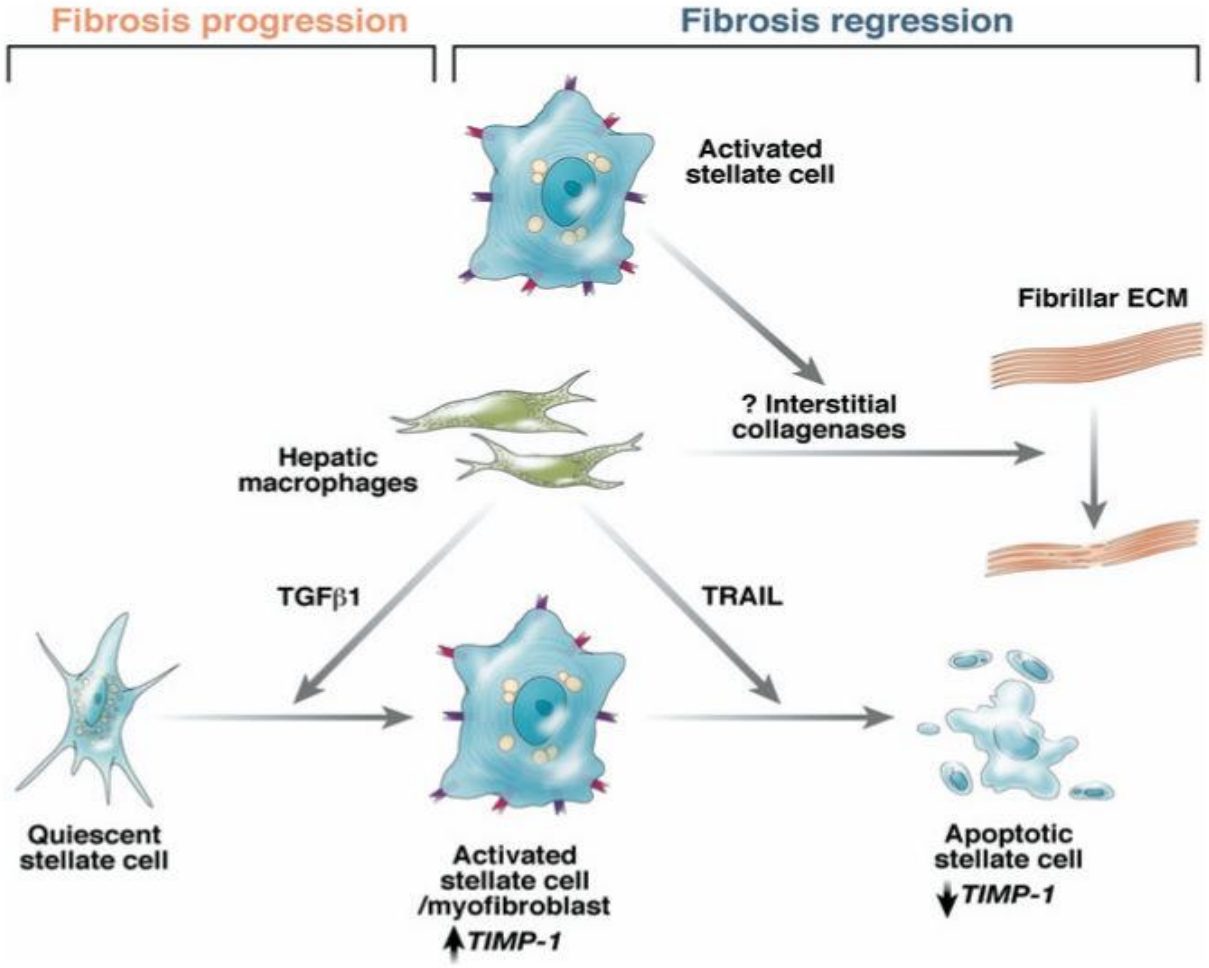
Liver fibrosis

Hepatic Stellate Cells (HSCs)



Subsequent to liver injury, HSCs become activated, express alpha-smooth muscle actin (a-SMA), and produce large amounts of collagen.

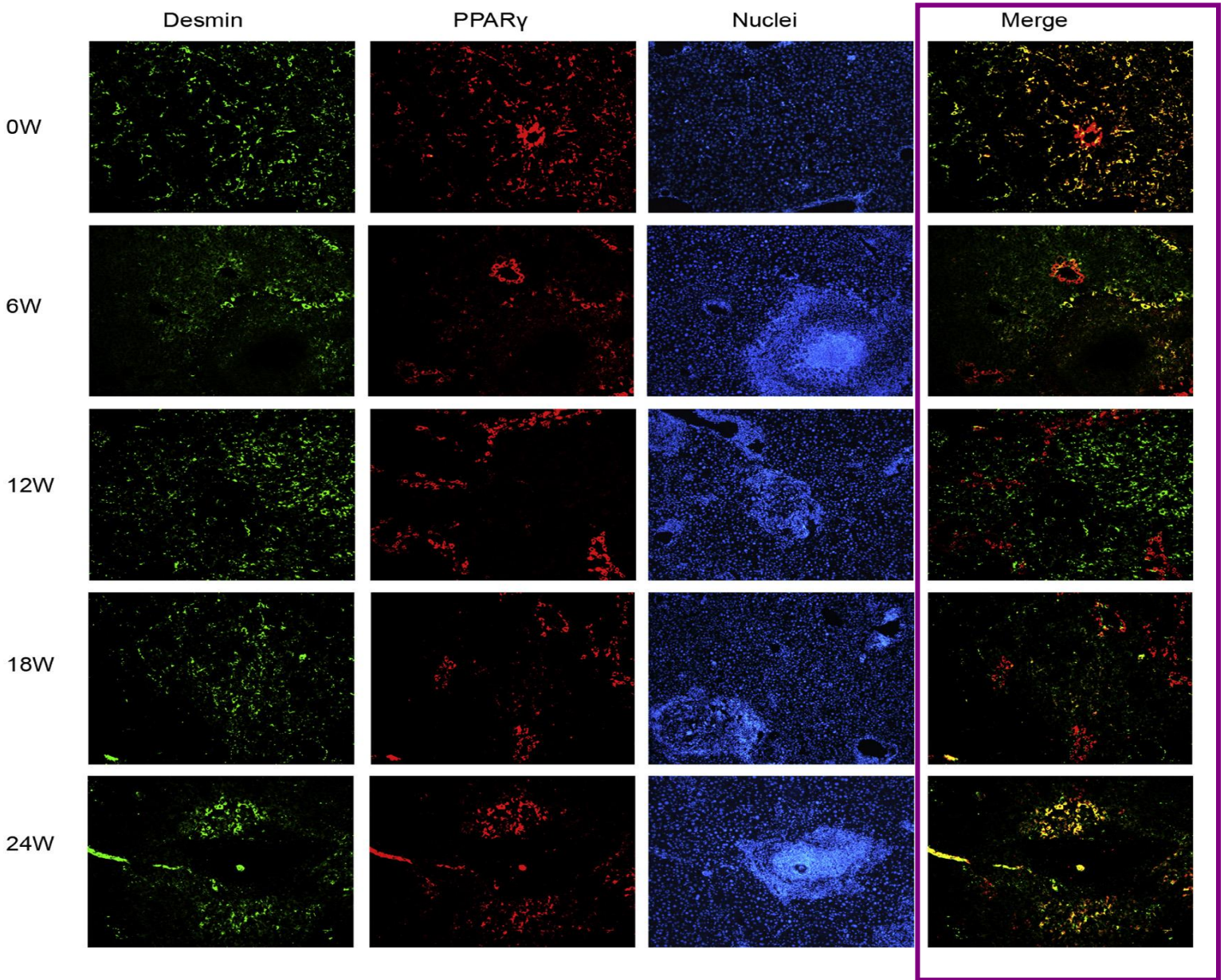
Scott L. Friedman. Mechanisms of Hepatic Fibrogenesis [J].

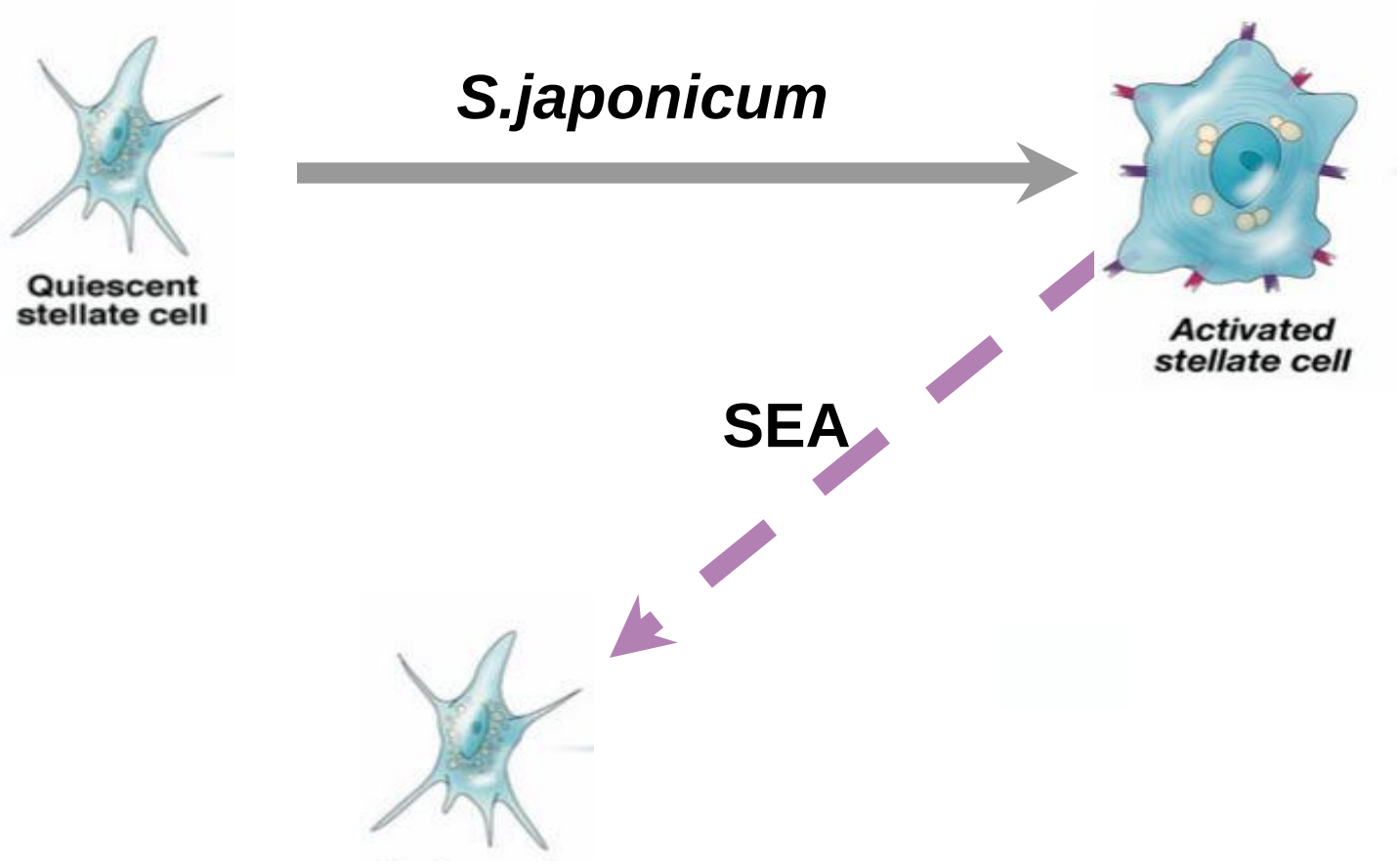


Evidence that fibrosis is reversible has intensified interest in understanding the regulation of matrix degradation and fibrosis resolution.

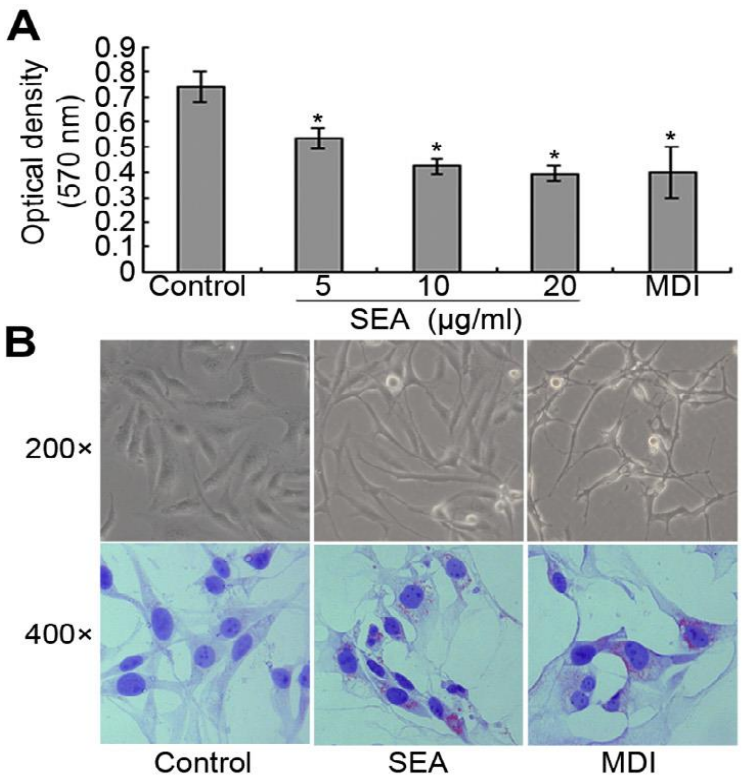
Scott L. Friedman. Mechanisms of Hepatic Fibrogenesis [J].

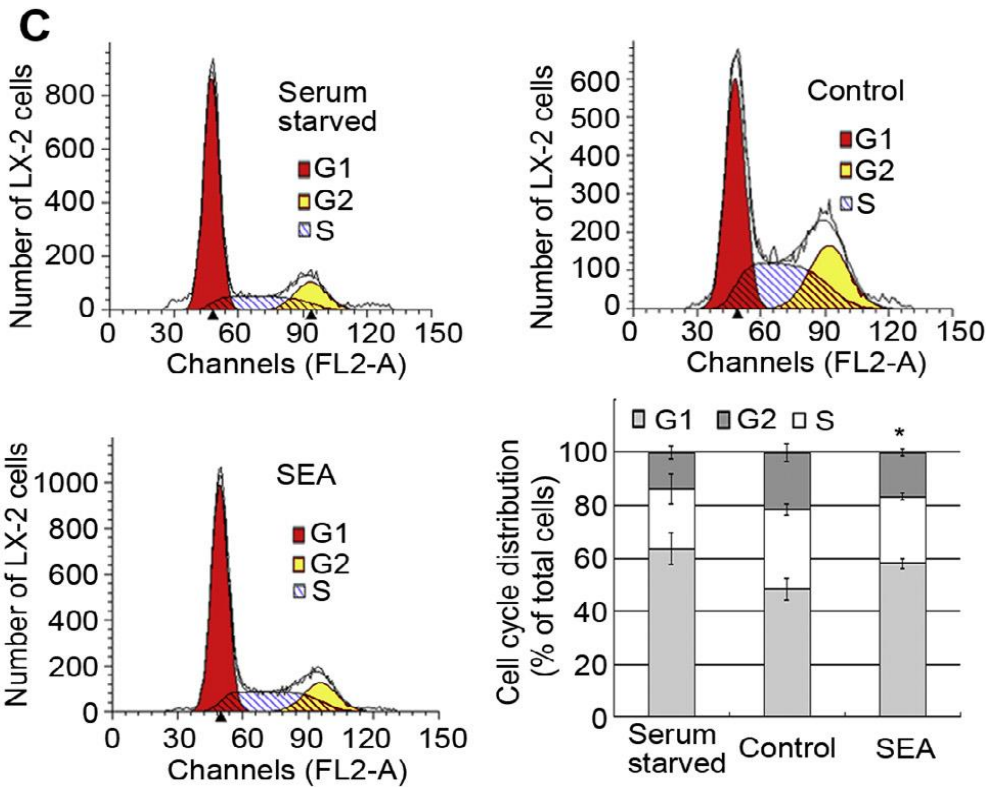
Schistosoma japonicum



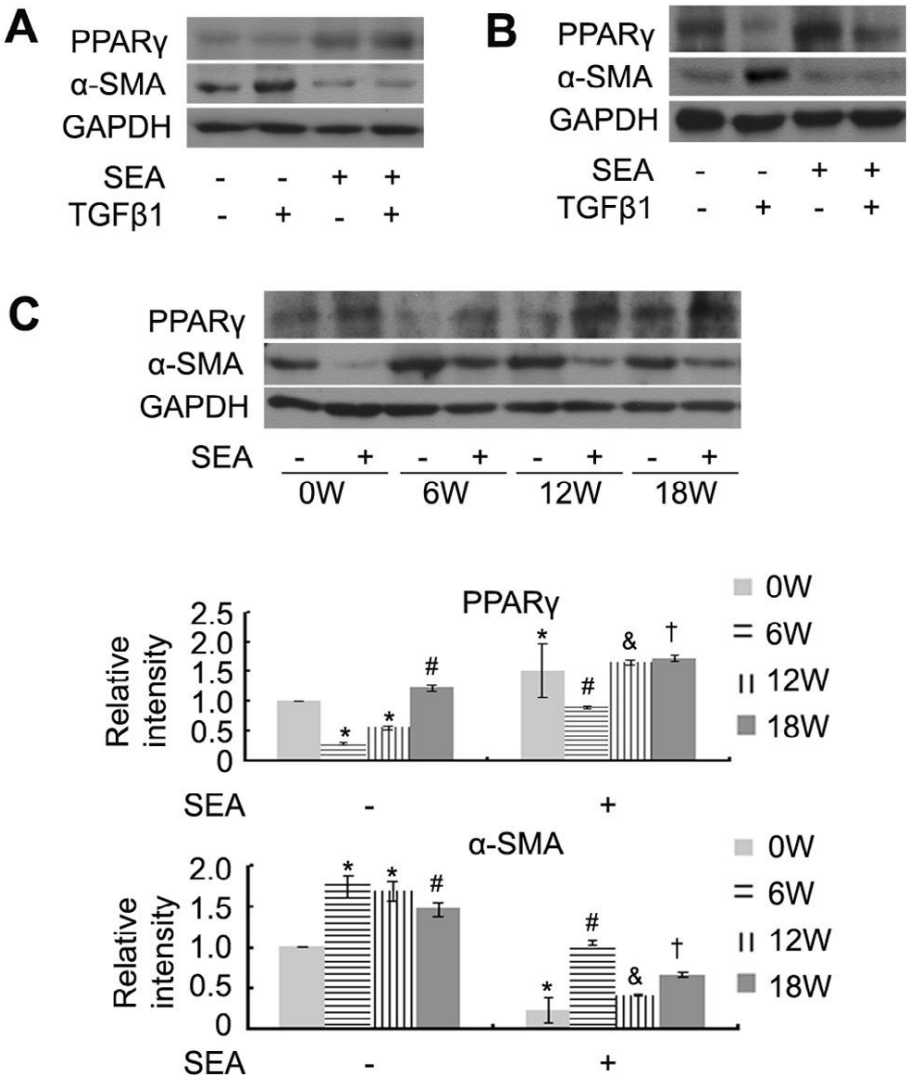

Quiescent stellate cell
S.japonicum
Activated stellate cell
SEA
Quiescence

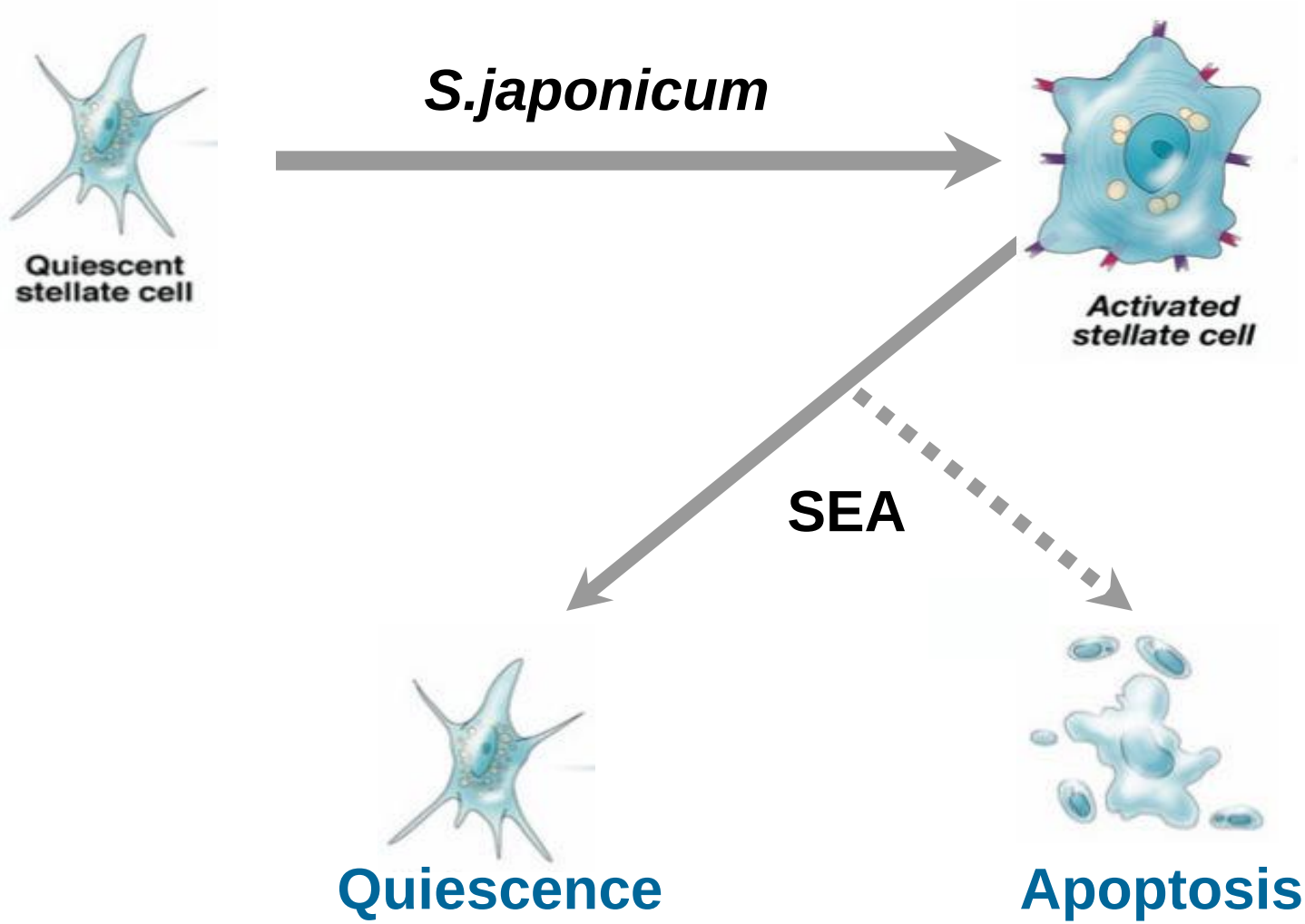
Effects of SEA on HSCs



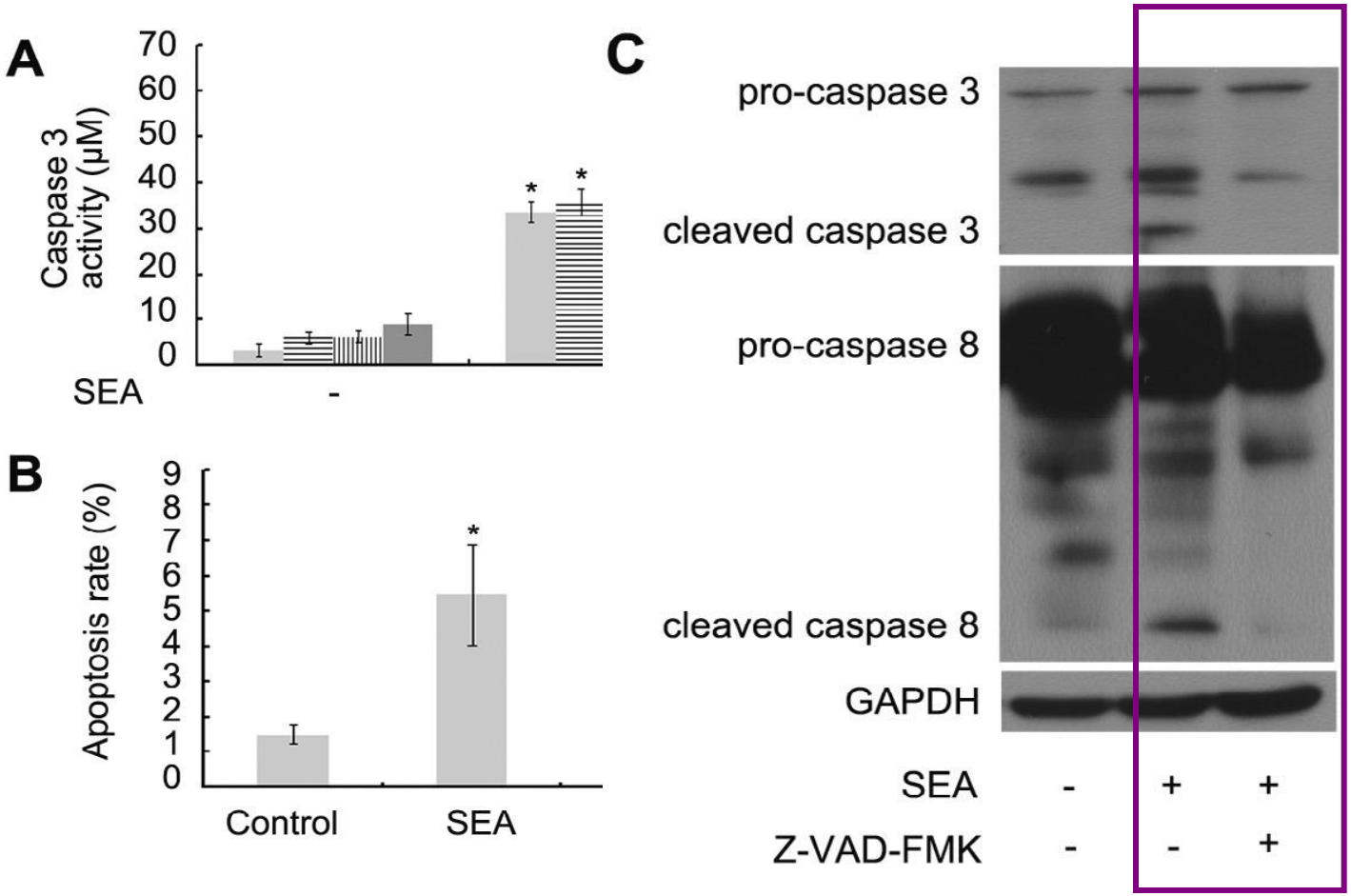


Effects of SEA on HSCs

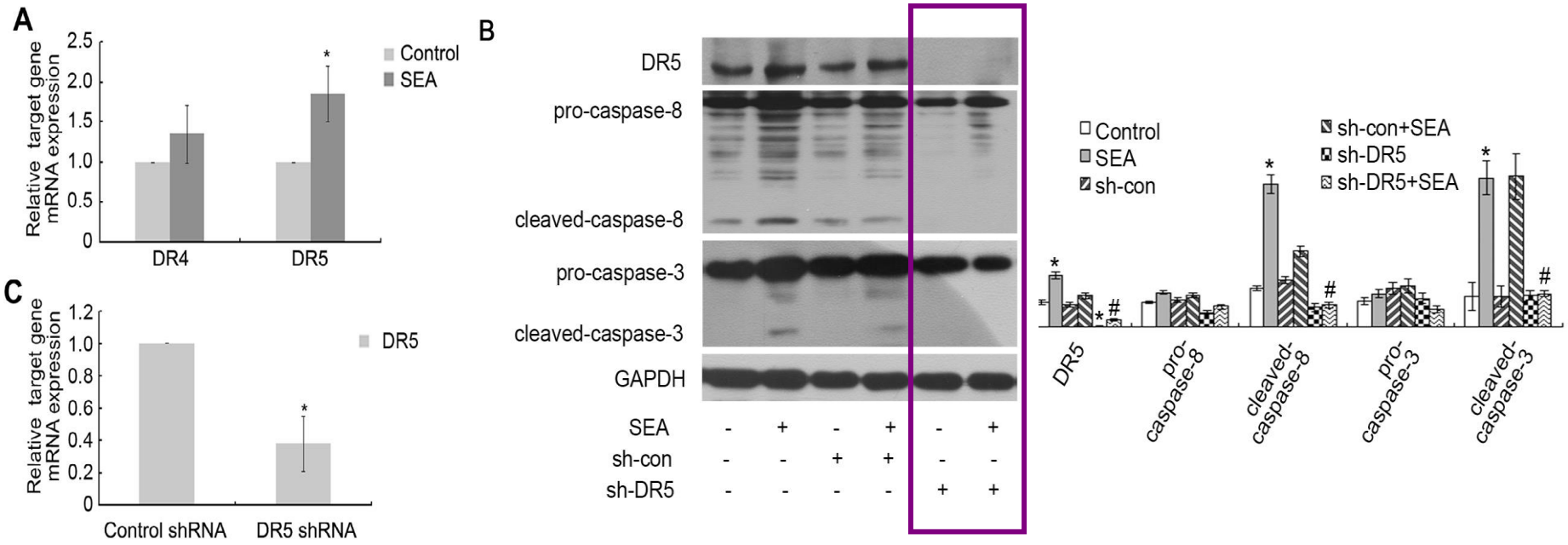



Quiescent stellate cell
S.japonicum
Activated stellate cell
SEA
Quiescence
Apoptosis

Effects of SEA on HSCs Apoptosis

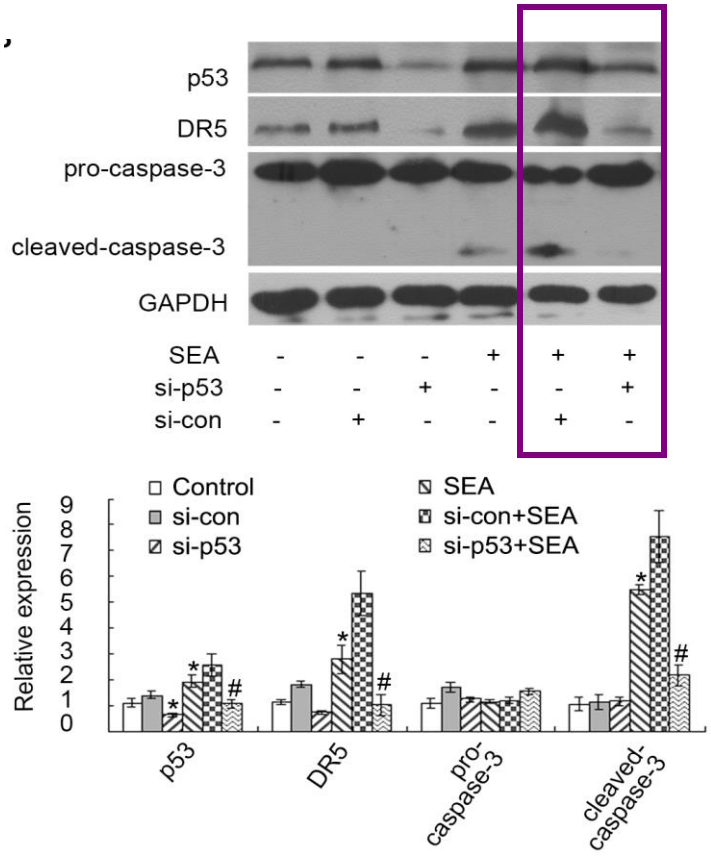


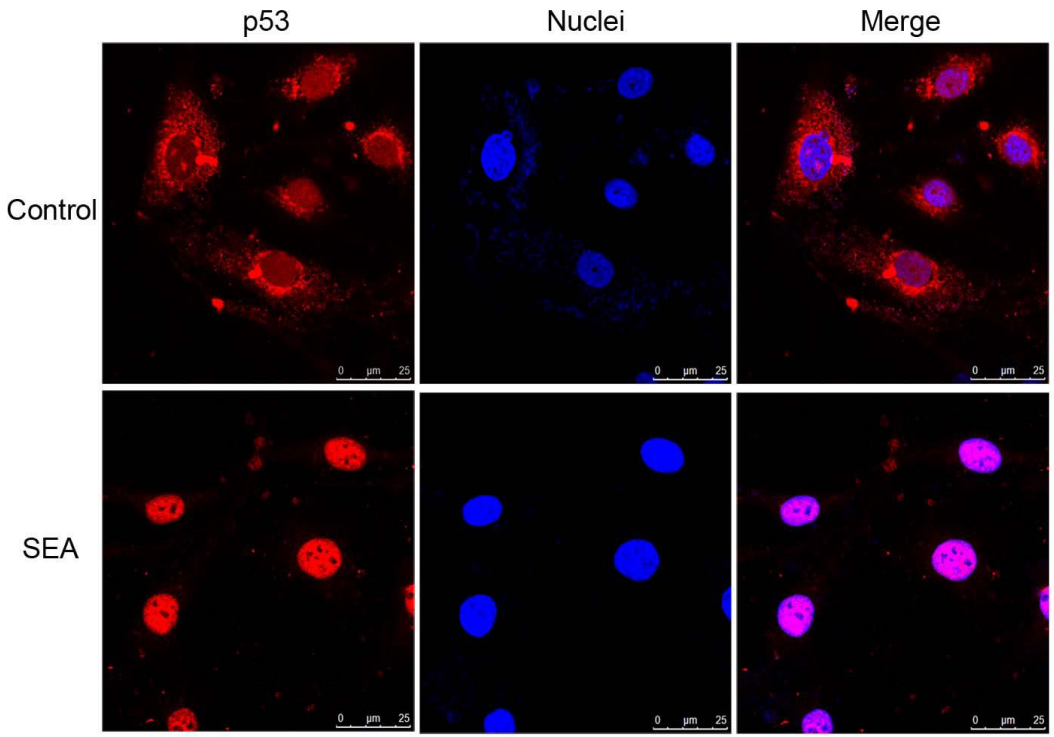
Effects of SEA on HSCs Apoptosis



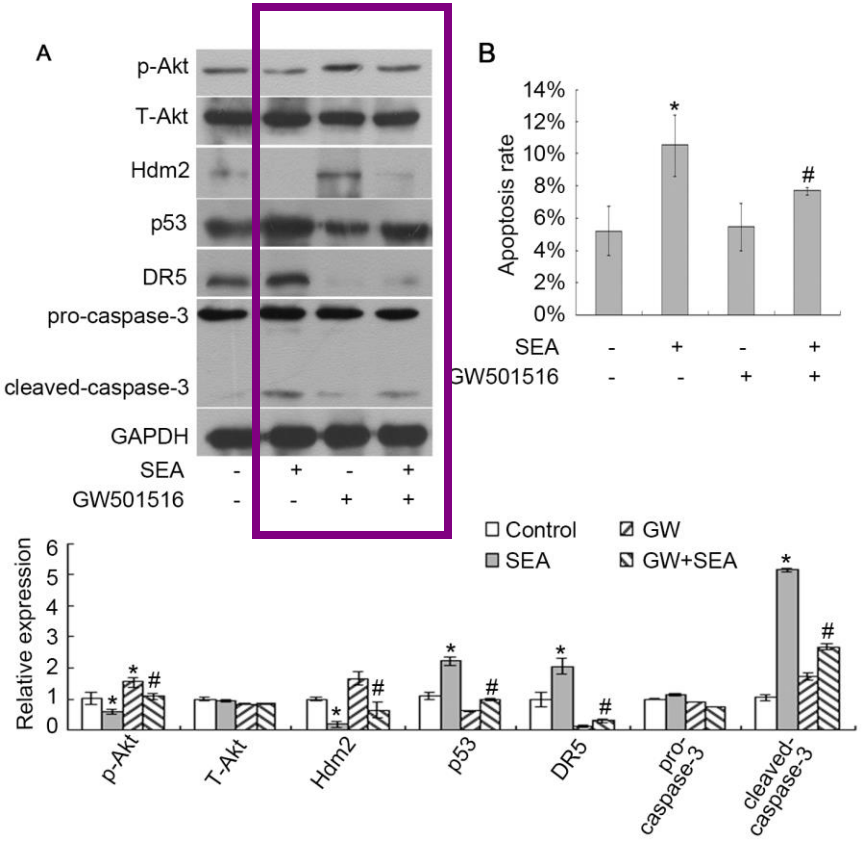
Death receptor 5(DR5), but not Death receptor 4 (DR4), DR4, was involved in SEA-induced apoptosis.

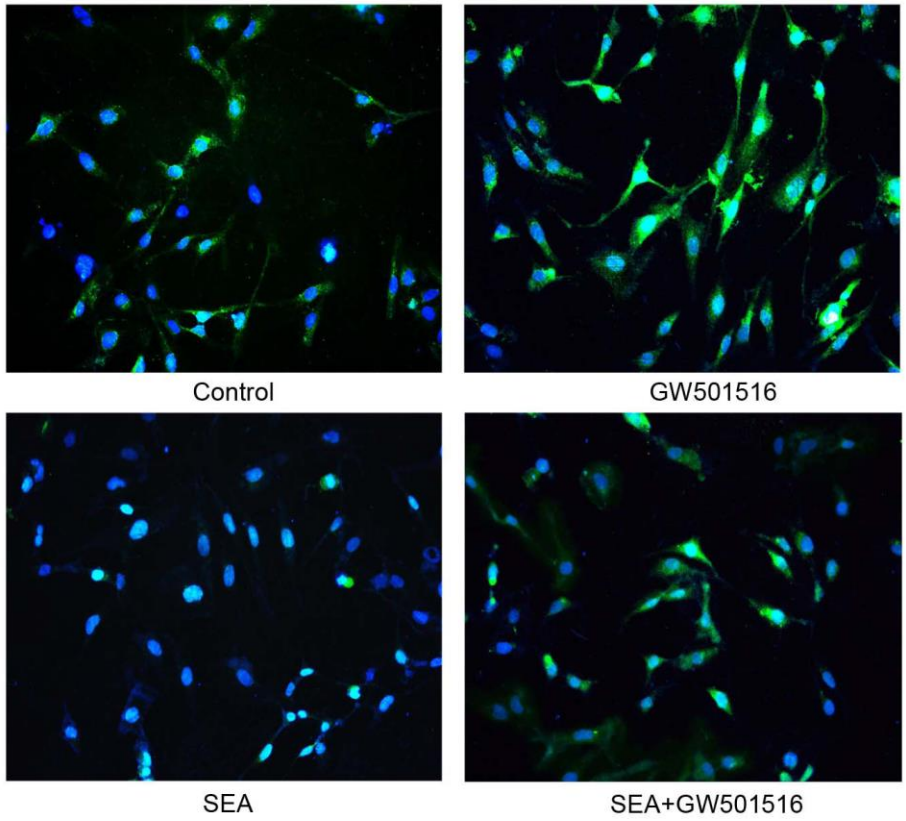
Effects of SEA on HSCs Apoptosis

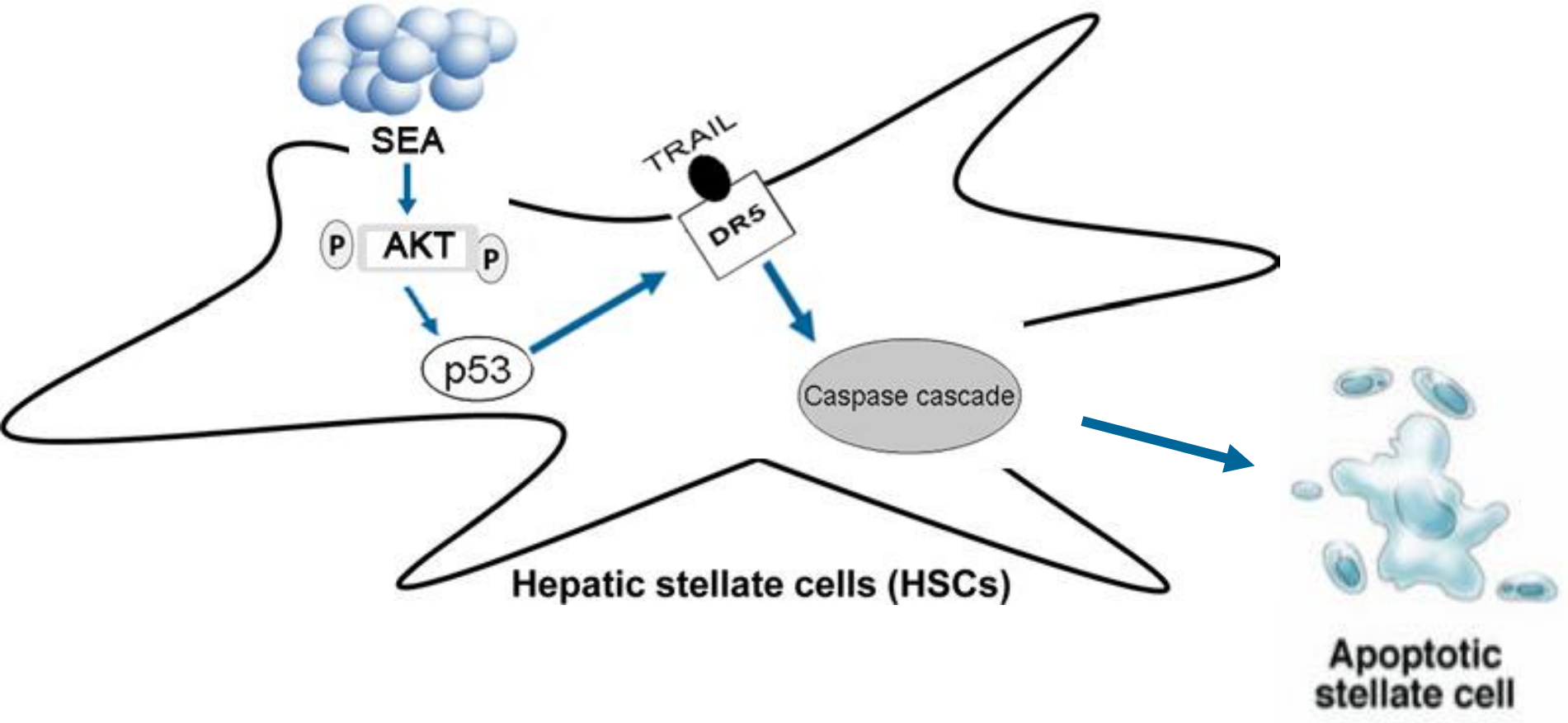


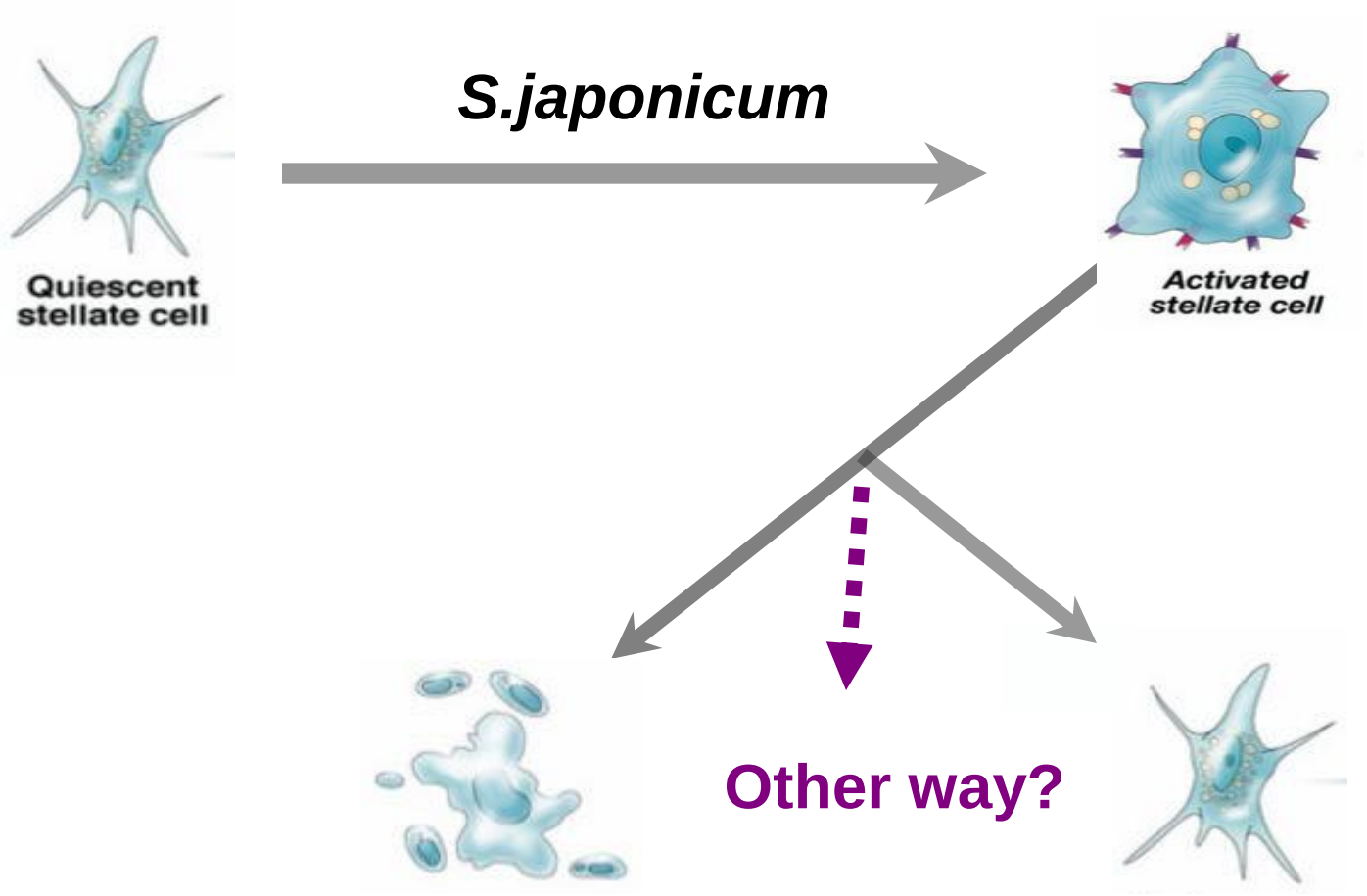


SEA-induced apoptosis via Akt/p53 axis






SEA
P
AKT
P
p53
TRAIL
DR5
Caspase cascade
Hepatic stellate cells (HSCs)
Apoptotic
stellate cell


S.japonicum
Quiescent stellate cell
Activated stellate cell
Other way?
Apoptosis
Quiescence

Welcome to our lab

E-mail address: yinongduan@aliyun.com (Y. Duan).

Articles

[1] **Duan Y**, Gu X, Zhu D, Sun W, Chen J: Dynamics of Sept4 expression in fibrotic livers of mice infected with *Schistosoma japonicum*. Parasitology, 138(8):1003-1010. 2011.

[2] Sun X, Yang Y, Zhu D, Qian H, **Duan Y**: Expression of Septin4 in human hepatic stellate cells LX-2 stimulated by LPS. Inflammation, 36(3):539-548. 2013.

[3] **Duan Y**, Gu X, Zhu D, Sun W, Chen J. *Schistosoma japonicum* soluble egg antigens induce apoptosis and inhibit activation of hepatic stellate cells: a possible molecular mechanism. Int J Parasitol, 44:217-224. 2014.

[4] Zhu DD, He X, **Duan YN**, Chen JL: Expression of microRNA-454 in TGF-β1-stimulated hepatic stellate cells and in mouse livers infected with *Schistosoma japonicum.* Parasite Vector, 31(7):148. 2014.

[5] Wang JX, Xu FF, Zhu DD, **Duan YN,** Chen JL: *Schistosoma japonicum* Soluble Egg Antigens Facilitate Hepatic Stellate Cell Apoptosis by Downregulating Akt Expression and Upregulating p53 and DR5 Expression. Plos one.8 (8): e3106. 2014.

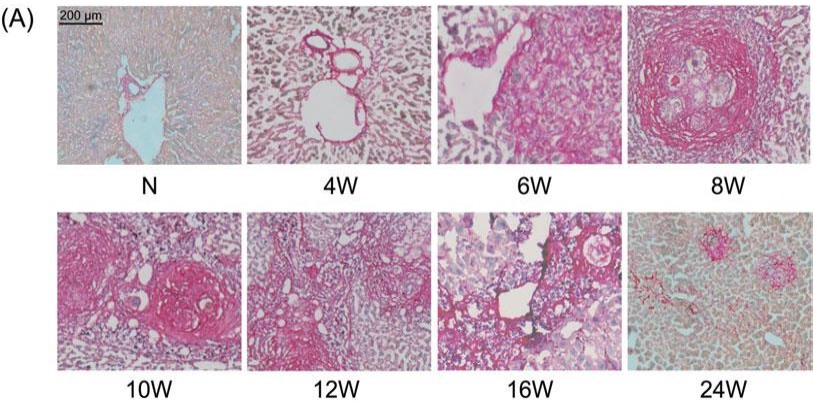
[6] He X, Bao J, Chen JL, **Duan YN**: Adenovirus-mediated over-expression of Septin4 ameliorates hepatic fibrosis in mouse livers infected with Schistosoma japonicum.Parasitology International, 64:487-492.2015.

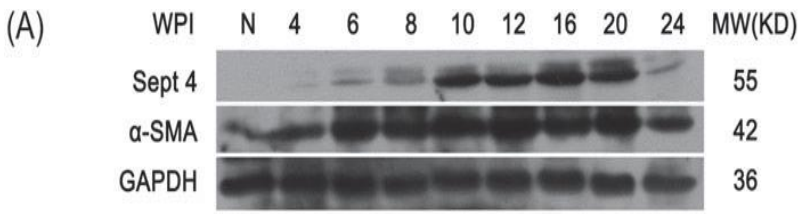
[7] Zhu DD, Song K, Chen JL, **Duan YN**:
Expression of Septin4 in *Schistosoma japonicum* infected mouse livers after praziqua ntel treatment. Parasite Vector, 8:19. 2015.

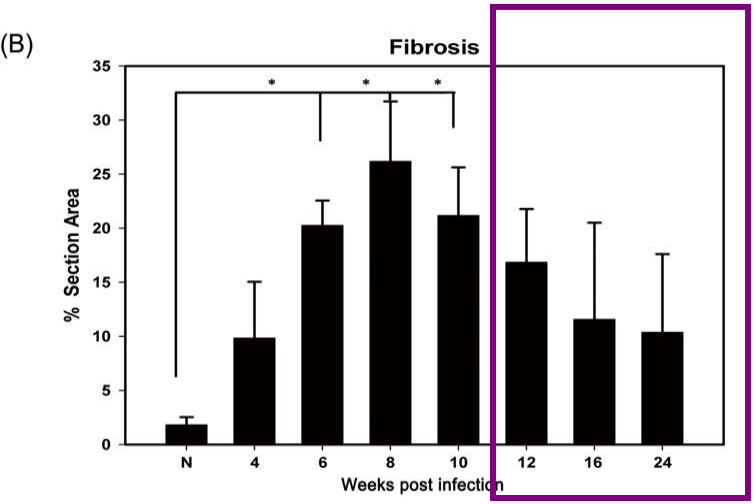
[8] Sun XL, Zhang LB, Wang JX, Chen JL, **Duan YN:** *Schistosoma japonicum* protein SjP40 inhibits TGF-β1-induced activation of hepatic stellate cells. Parasitol Res,2015.

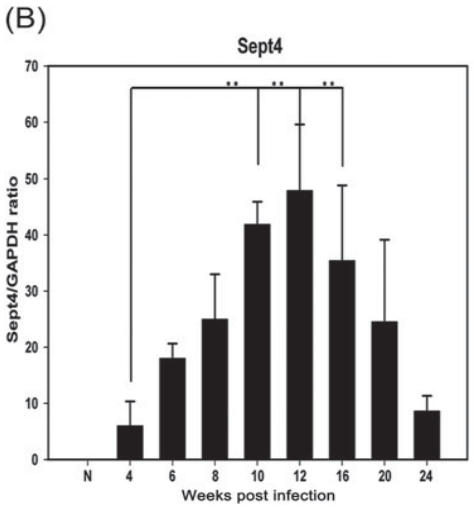
Thank you for your attention

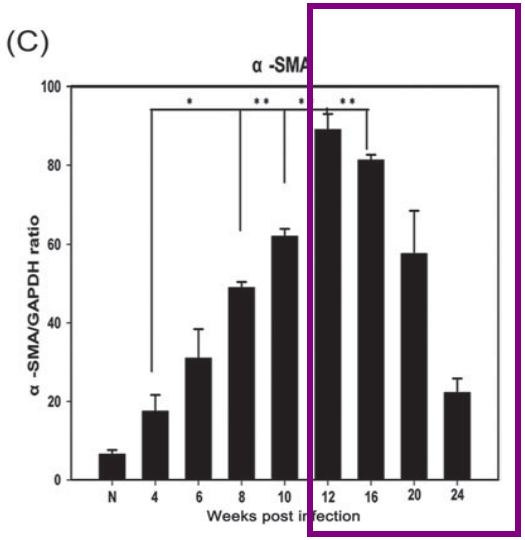
Schistosoma japonicum

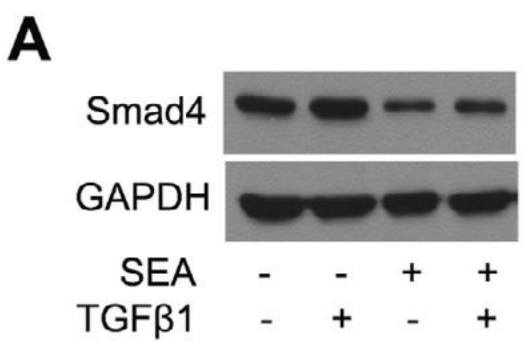


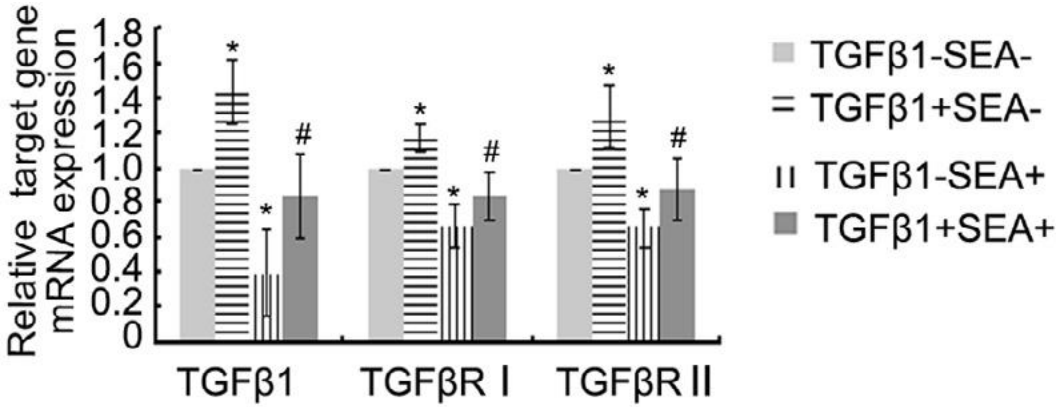


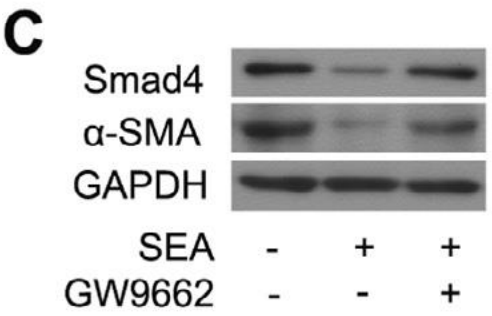


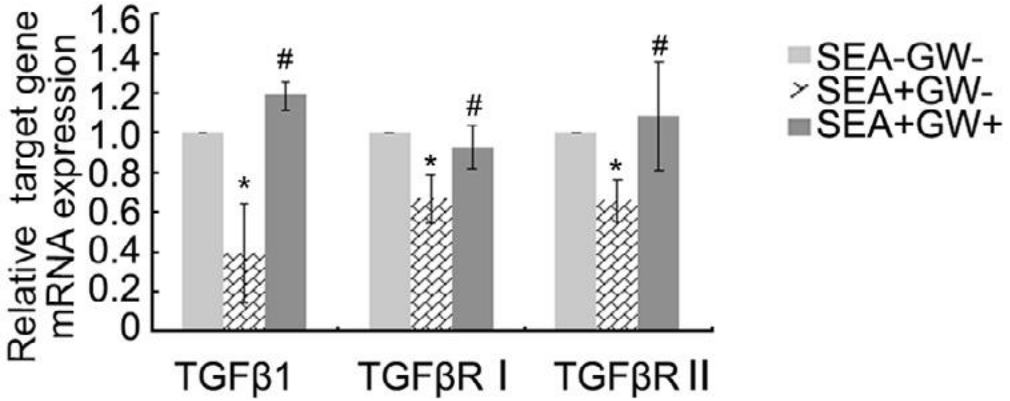





A
Smad4
GAPDH
SEA - - + +
TGFβ1 - + - +


B
Relative target gene mRNA expression
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
TGFβ1
TGFβR I
TGFβR II
TGFβ1-SEA-
TGFβ1+SEA-
TGFβ1-SEA+
TGFβ1+SEA+


C
Smad4
α-SMA
GAPDH
SEA - + +
GW9662 - - +


D
Relative target gene mRNA expression
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
TGFβ1
TGFβR I
TGFβR II
SEA-GW-
SEA+GW-
SEA+GW+

Effects of SEA on HSCs Apoptosis