



Ingeniería en Biotecnología  
Universidad de Chile

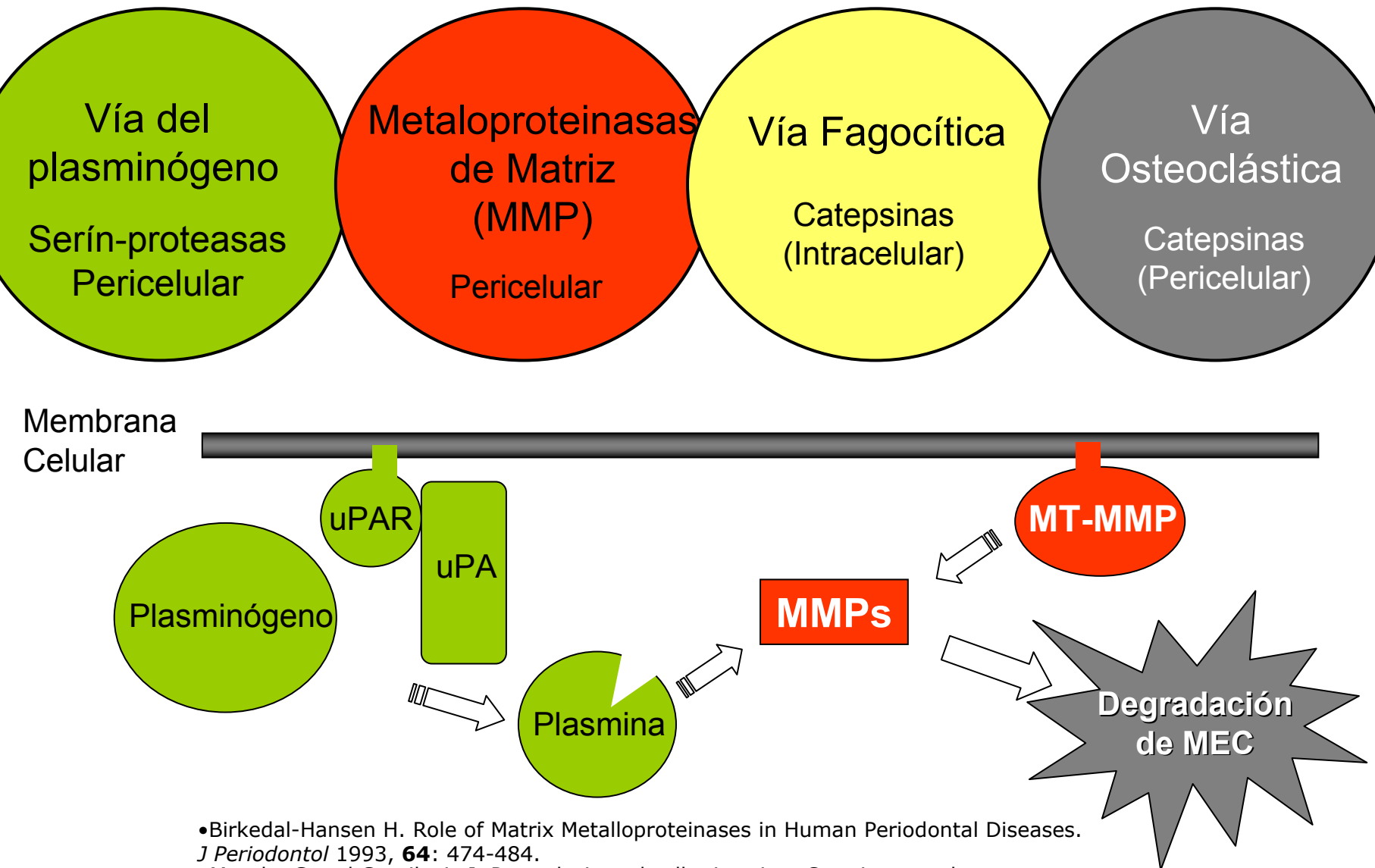
# Remodelación Tisular

Patricio Smith F.

## Remodelación Tisular

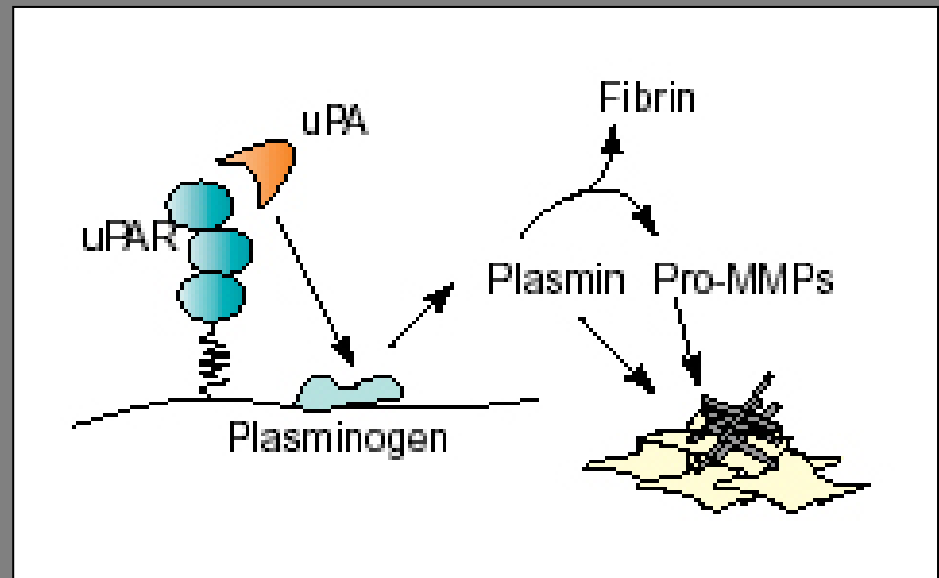
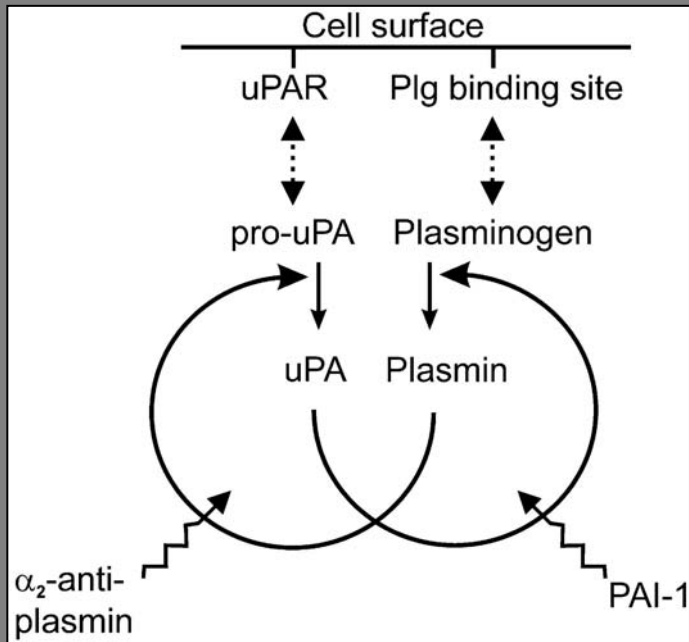
- Recambio normal
- Desarrollo
- Inflamación
- Reparación
- Invasión tumoral y Metástasis

# Vías de Degradación de Moléculas de MEC

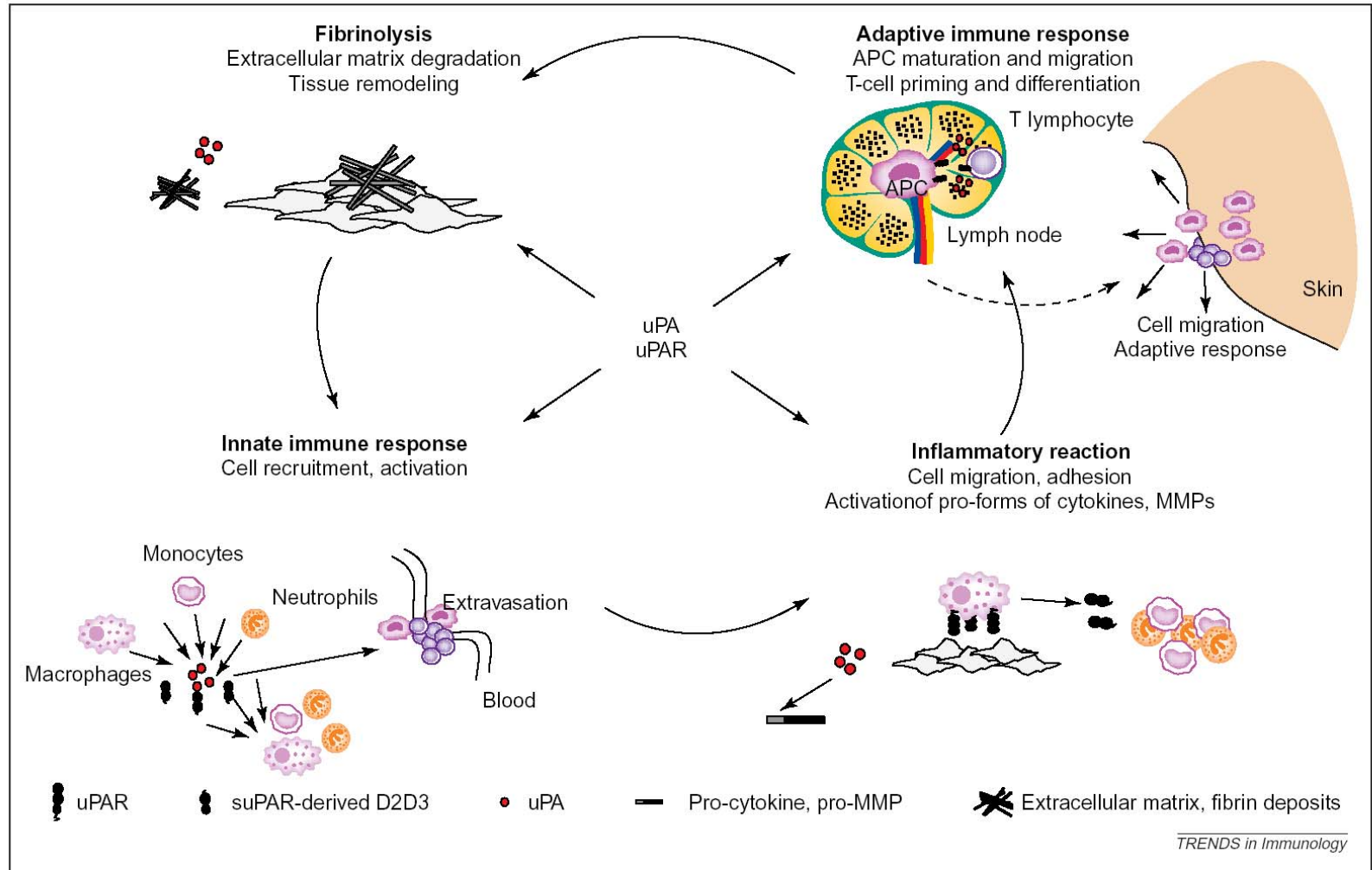


- Birkedal-Hansen H. Role of Matrix Metalloproteinases in Human Periodontal Diseases. *J Periodontol* 1993, **64**: 474-484.
- Murphy G and Gavrilovic J. Proteolysis and cell migration. Creating a path. *Curr Opin Cell Biol.* 1999, **11**: 614-621.

# Vía de activación del plasminógeno

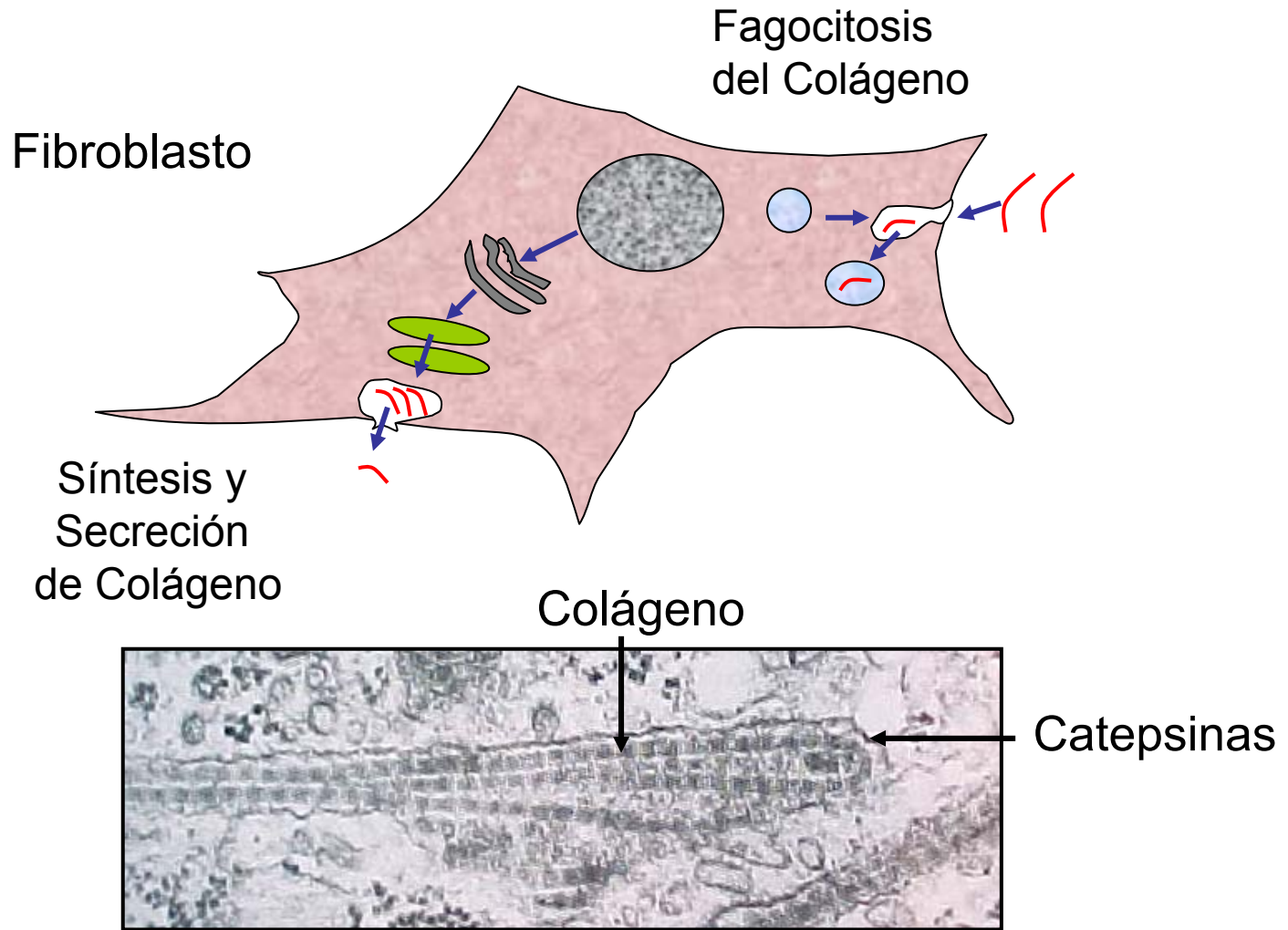


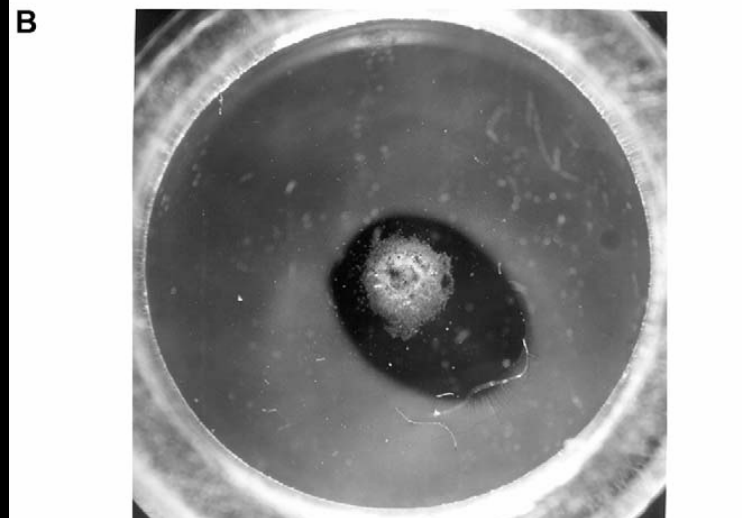
# Vía de activación del plasminógeno



**Figure 1.** uPA and uPAR contribute to fibrinolysis, inflammation, and innate and adaptive immune responses. Abbreviations: APC, antigen-presenting cell; MMP, matrix metalloprotease; uPA, urokinase plasminogen activator; uPAR, uPA receptor; suPAR, soluble uPAR.

# Vía Fagocítica



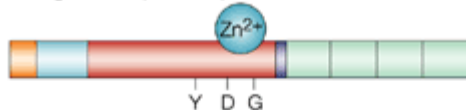


Lapière y Gross. PNAS 1962.

# Metaloproteinasas de Matriz Extracelular

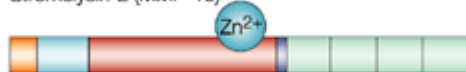
## Archetypal MMPs

Collagenases  
Collagenase-1 (MMP-1)  
Collagenase-2 (MMP-8)  
Collagenase-3 (MMP-13)



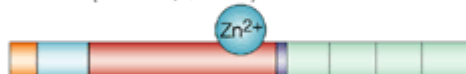
## Stromelysins

Stromelysin-1 (MMP-3)  
Stromelysin-2 (MMP-10)



## Other MMPs

Metalloelastase (MMP-12)  
MMP-19  
Enamelysin (MMP-20)  
MMP-27 (MMP-22, C-MMP)



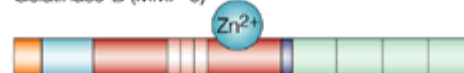
## Matrilysins

Matrilysin (MMP-7)  
Matrilysin-2 (MMP-26)



## Gelatinases

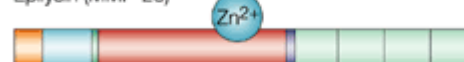
Gelatinase-A (MMP-2)  
Gelatinase-B (MMP-9)



## Convertase-activatable MMPs

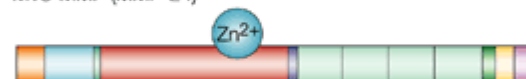
### Secreted

Stromelysin-3 (MMP-11)  
MMP-21 (X-MMP)  
Epilysin (MMP-28)



### Membrane-associated

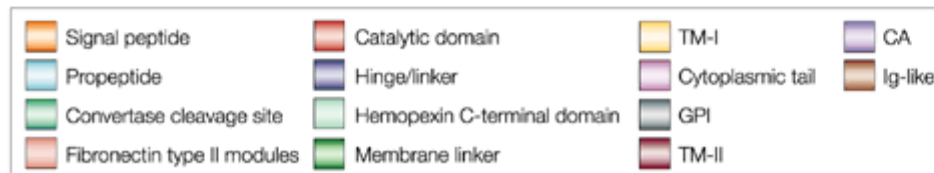
MT1-MMP (MMP-14)  
MT2-MMP (MMP-15)  
MT3-MMP (MMP-16)  
MT5-MMP (MMP-24)



MT4-MMP (MMP-17)  
MT6-MMP (MMP-25)



MMP-23A  
MMP-23B



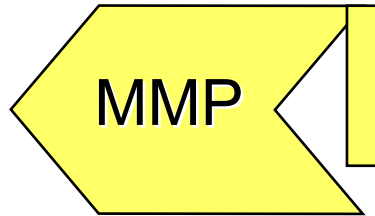


# Metaloproteinasas de Matriz Extracelular

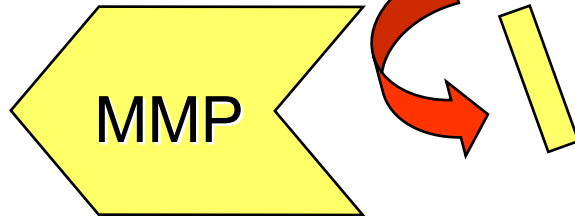
Basic	MMP1, -3, -8, -10, -12, -13, -18, -19, -20, -22, -27 ColA, ColB	
Minimal	MMP7, -26	
Furin-activated	MMP11, -28	
Membrane-anchored	TM: MMP14, -15, -16, -24 GPI: MMP17, -25	
Gelatin-binding	MMP2, -9	
Type II membrane	MMP23	

# Regulación de la actividad de las MMPs

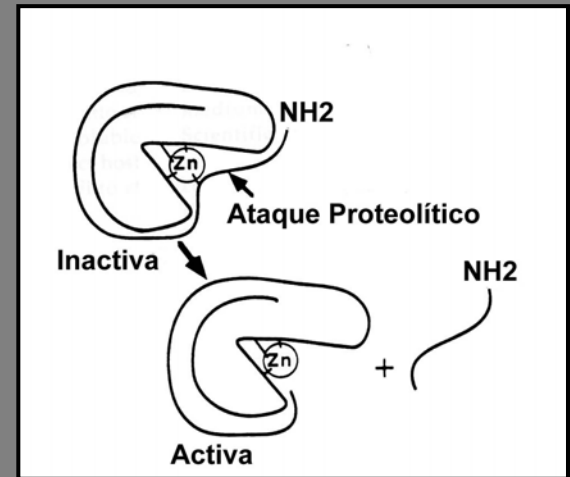
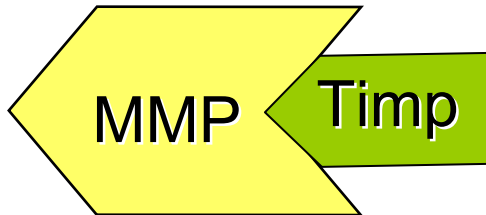
Inactiva



Activa

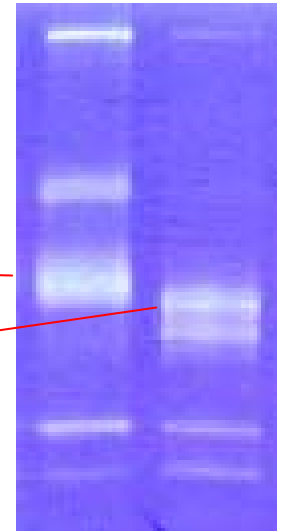


Inhibida

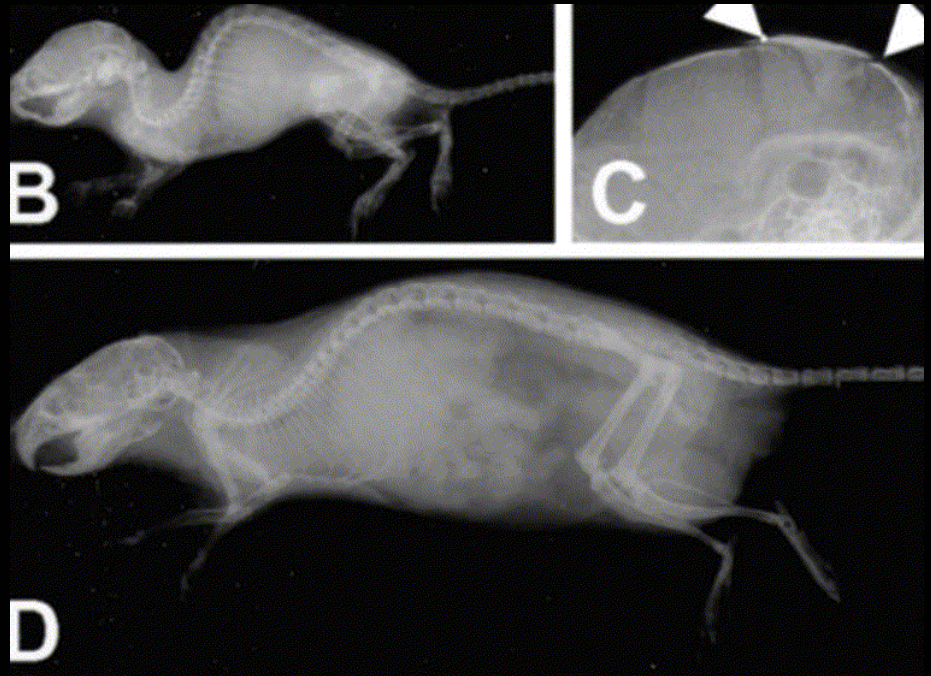
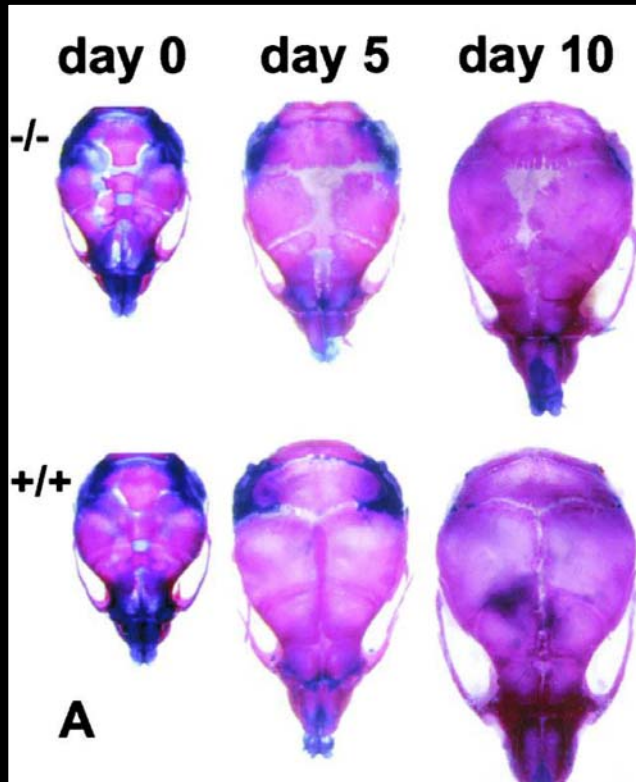


Pro-MMP-9

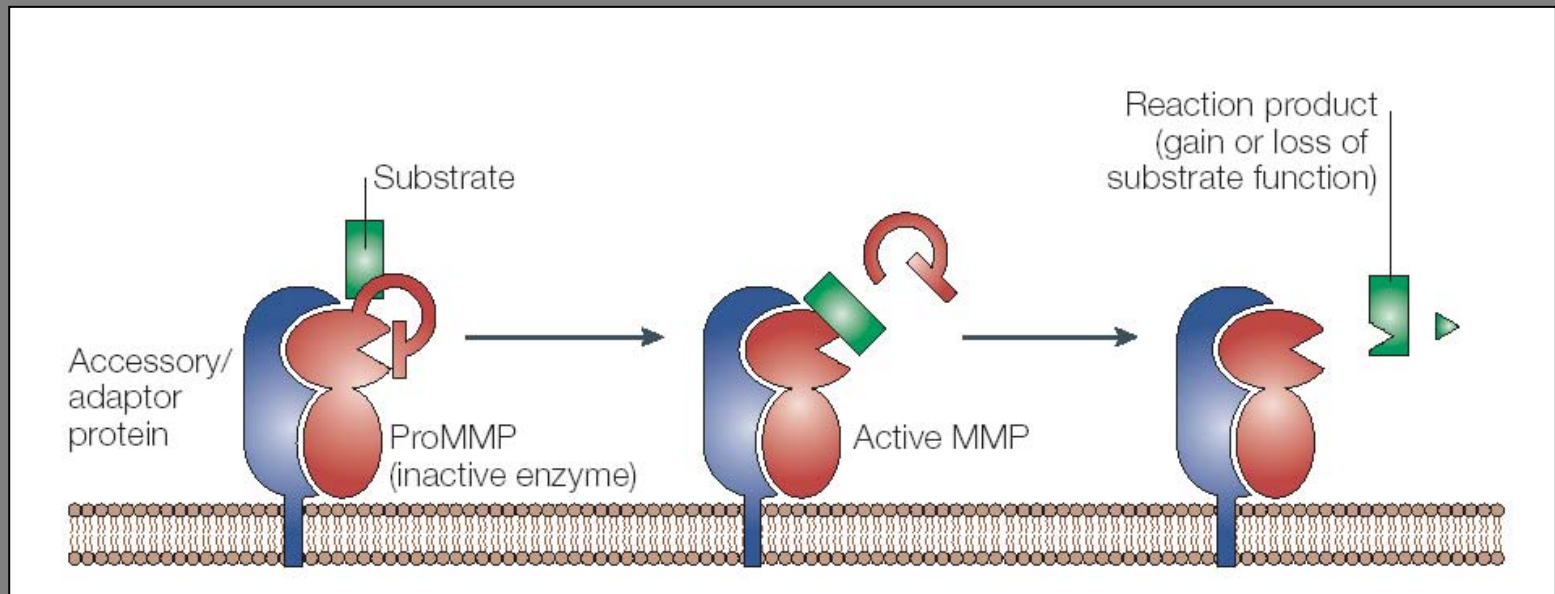
MMP-9 activa



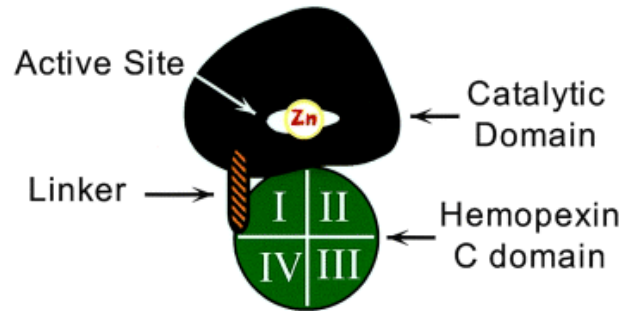
# Knock out MT1-MMP



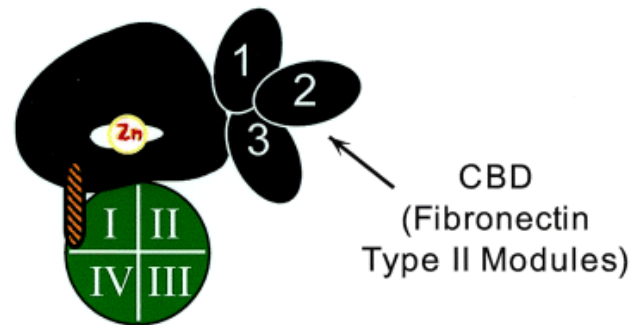
# Regulación de la actividad de las MMPs



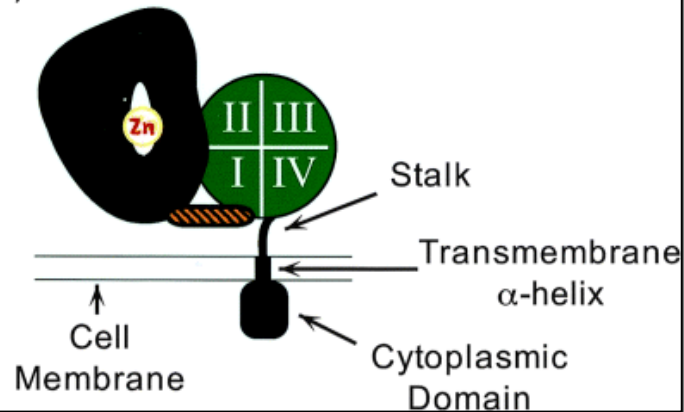
a) Archetypal MMP Structure



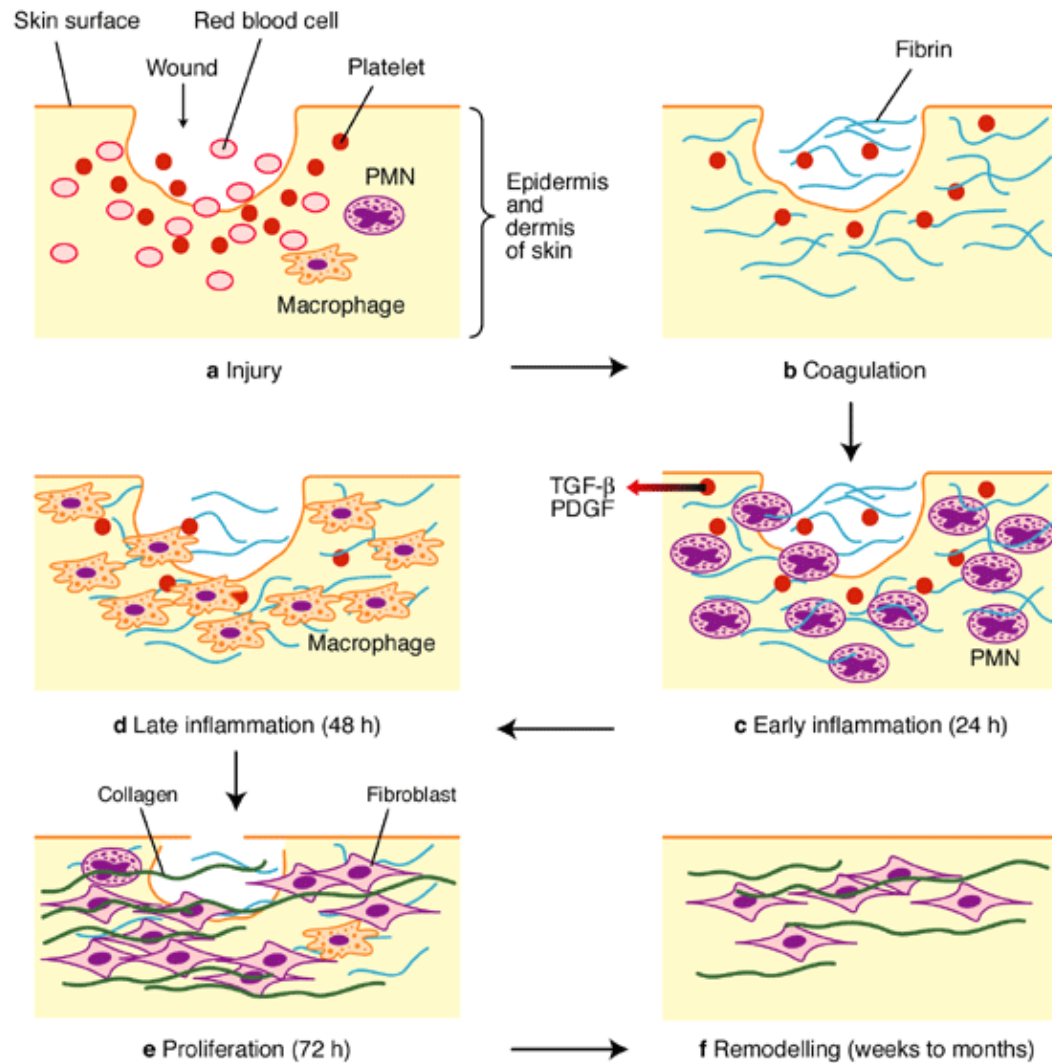
b) Gelatinases



c) MT-MMPs



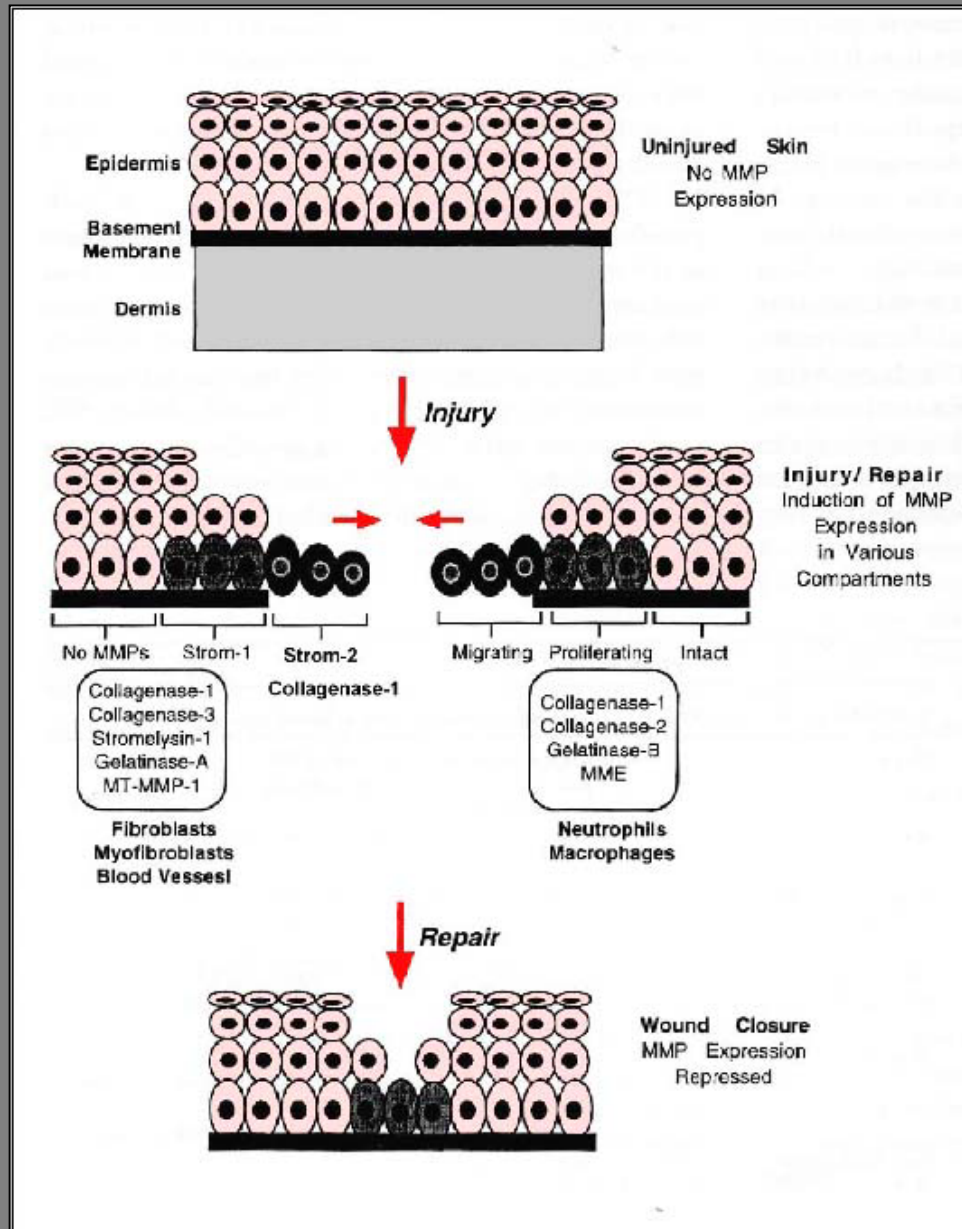
# Reparación Tisular



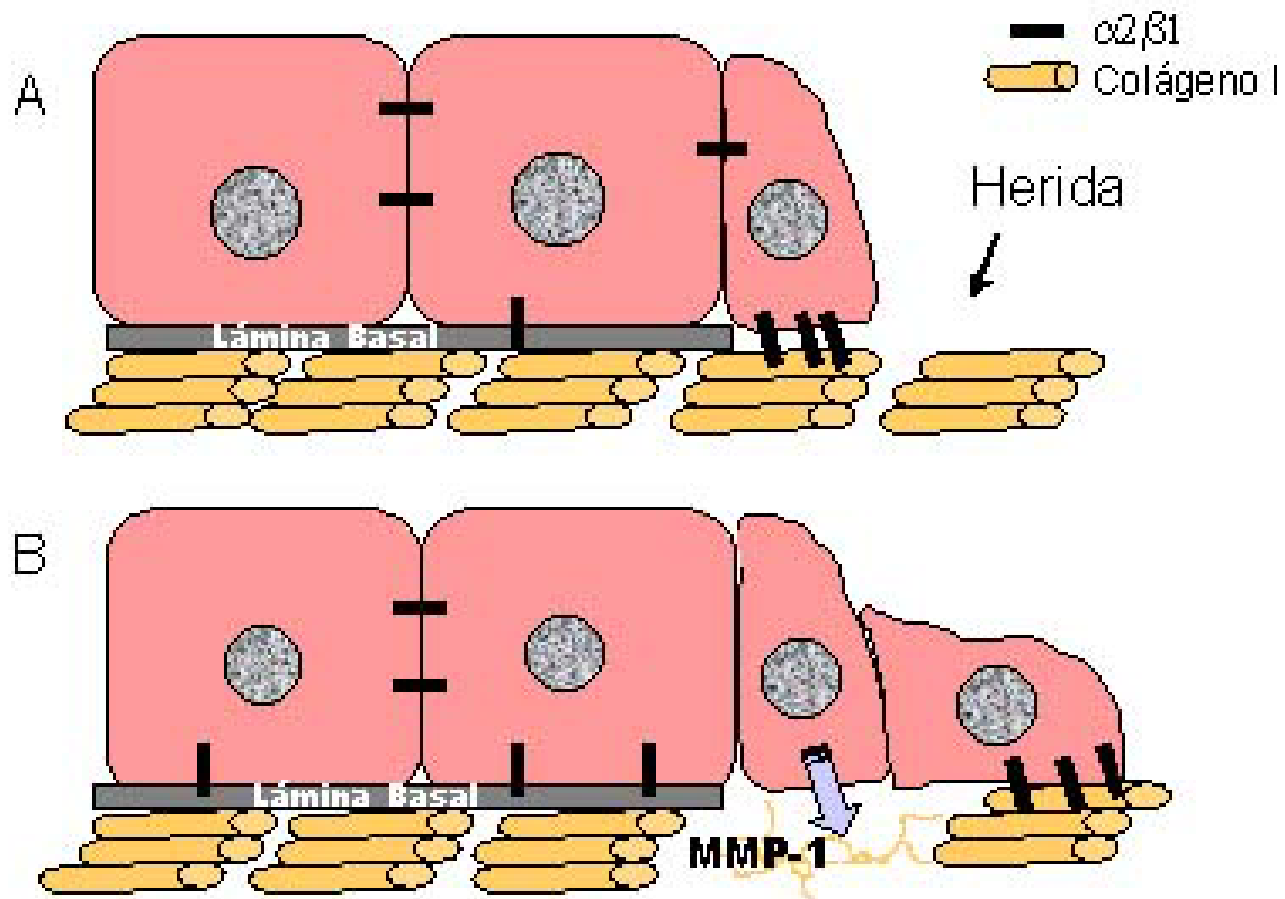
The phases of cutaneous wound healing



# Reparación Tisular

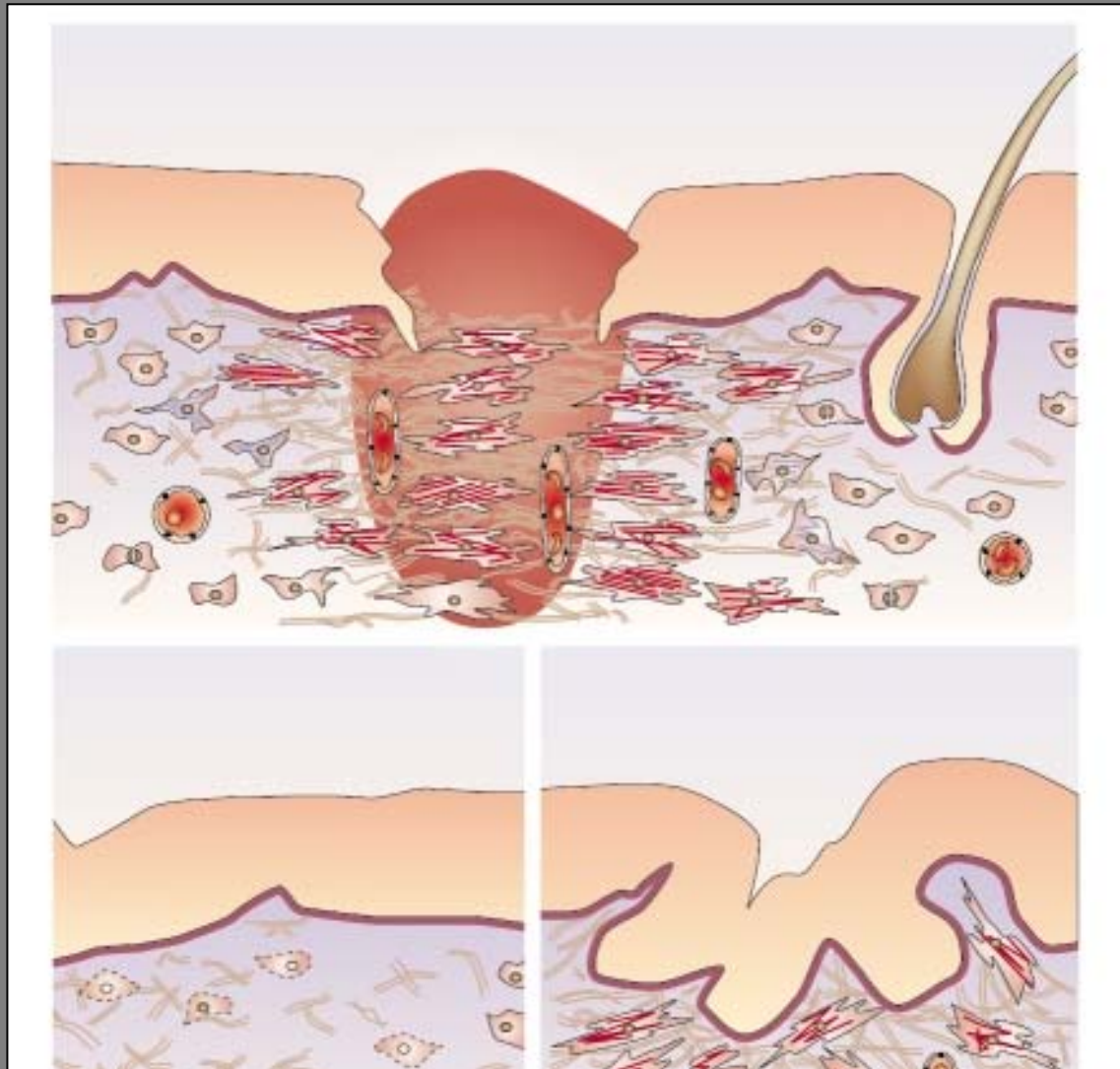


# Reparación Tisular

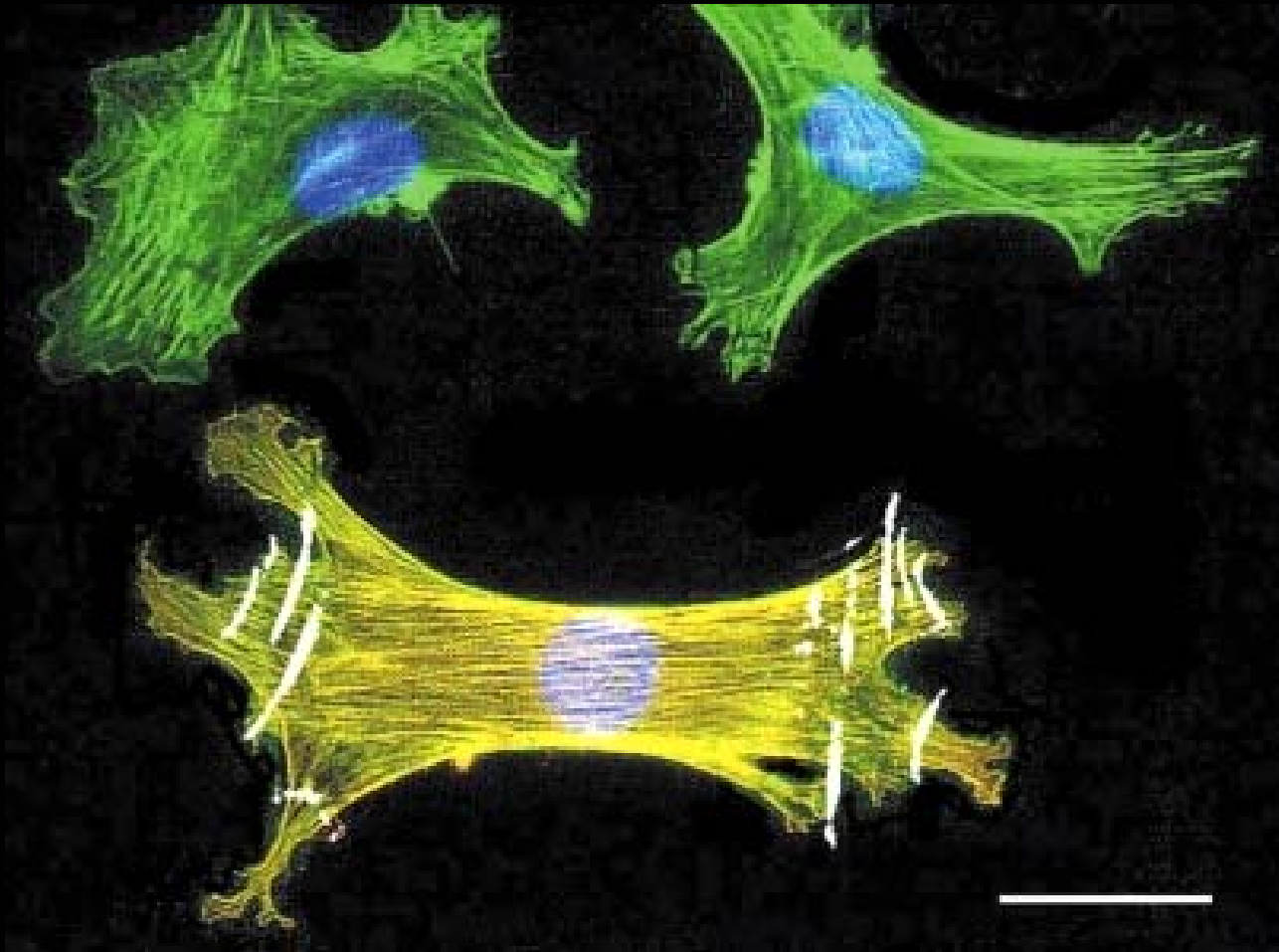




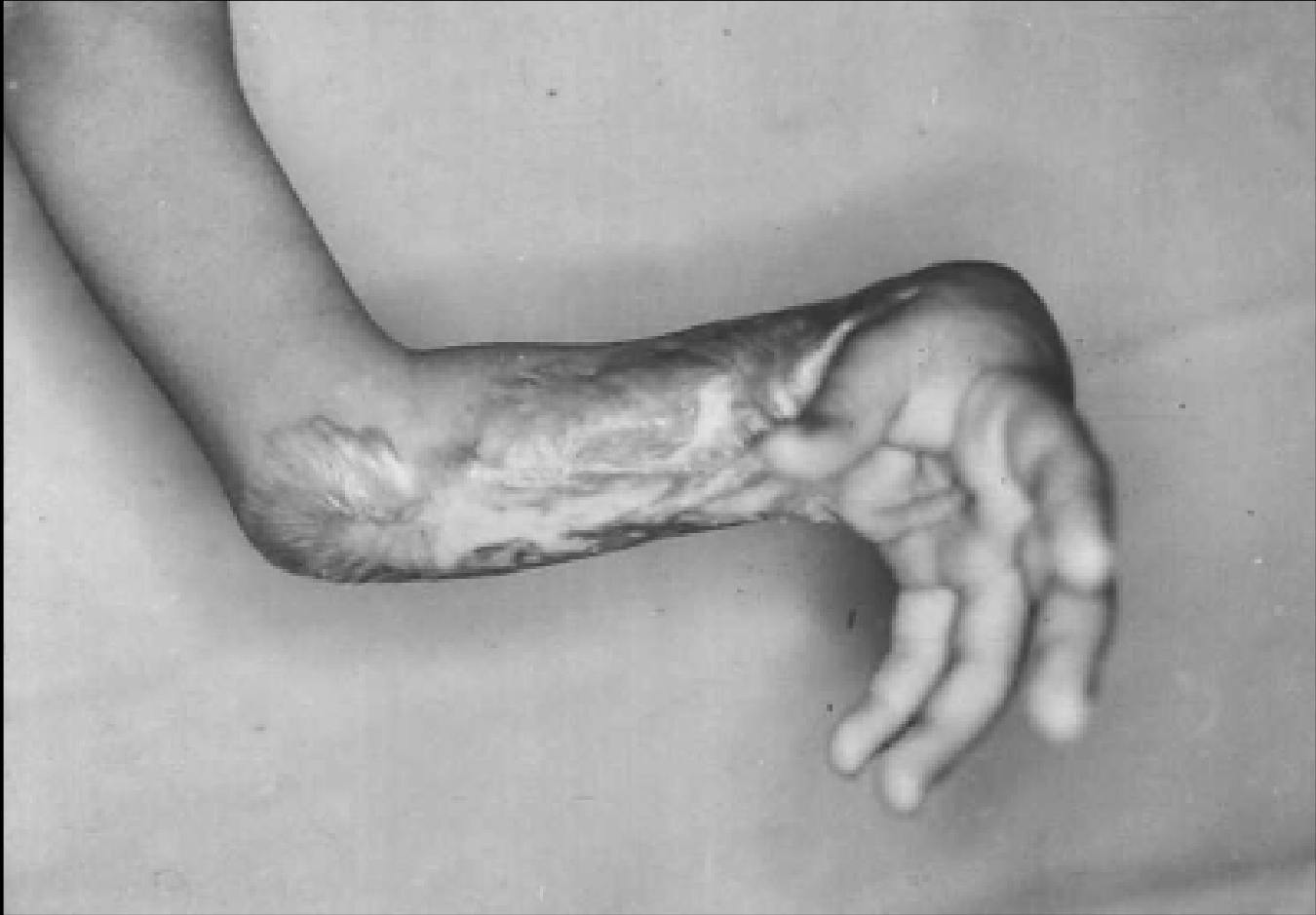
# Reparación Tisular



# Reparación Tisular

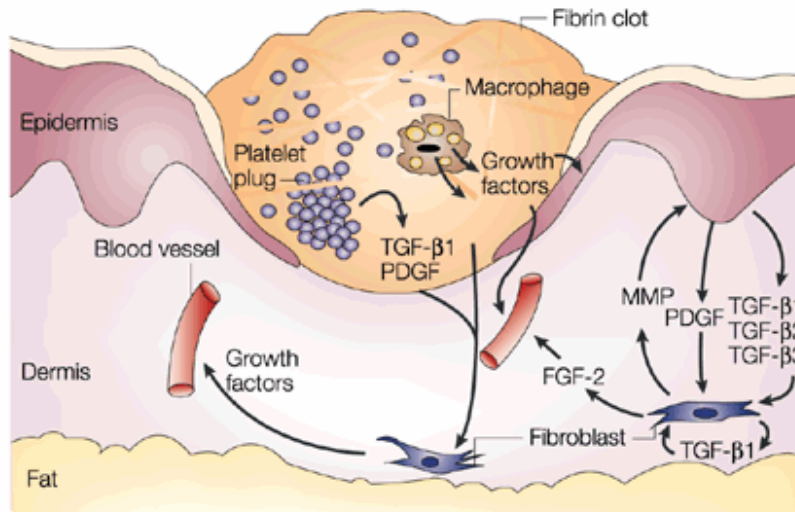


# Reparación Tisular

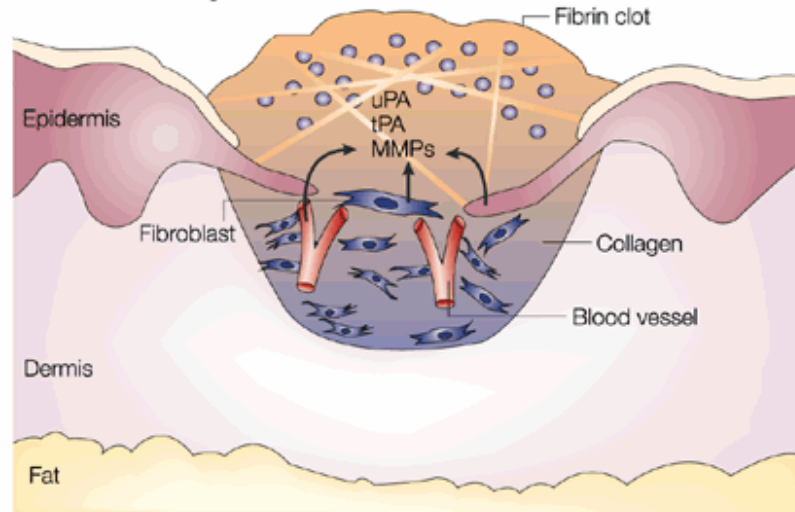


# Invasión tumoral y metástasis

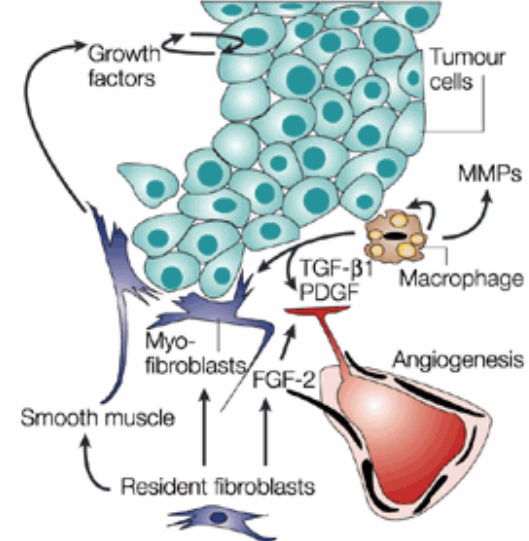
**a Wound healing**



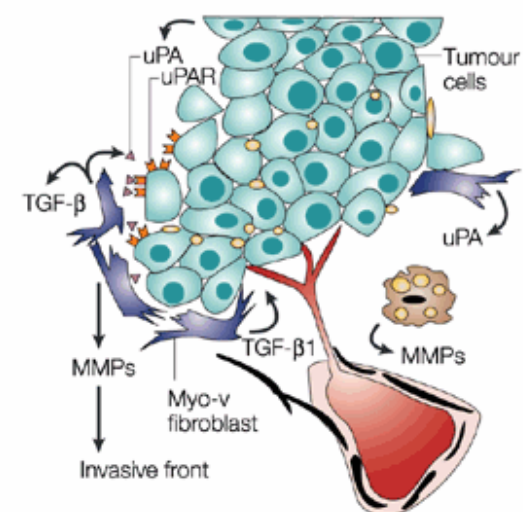
**b Wound healing**



**c Breast tumour**



**d Breast tumour**

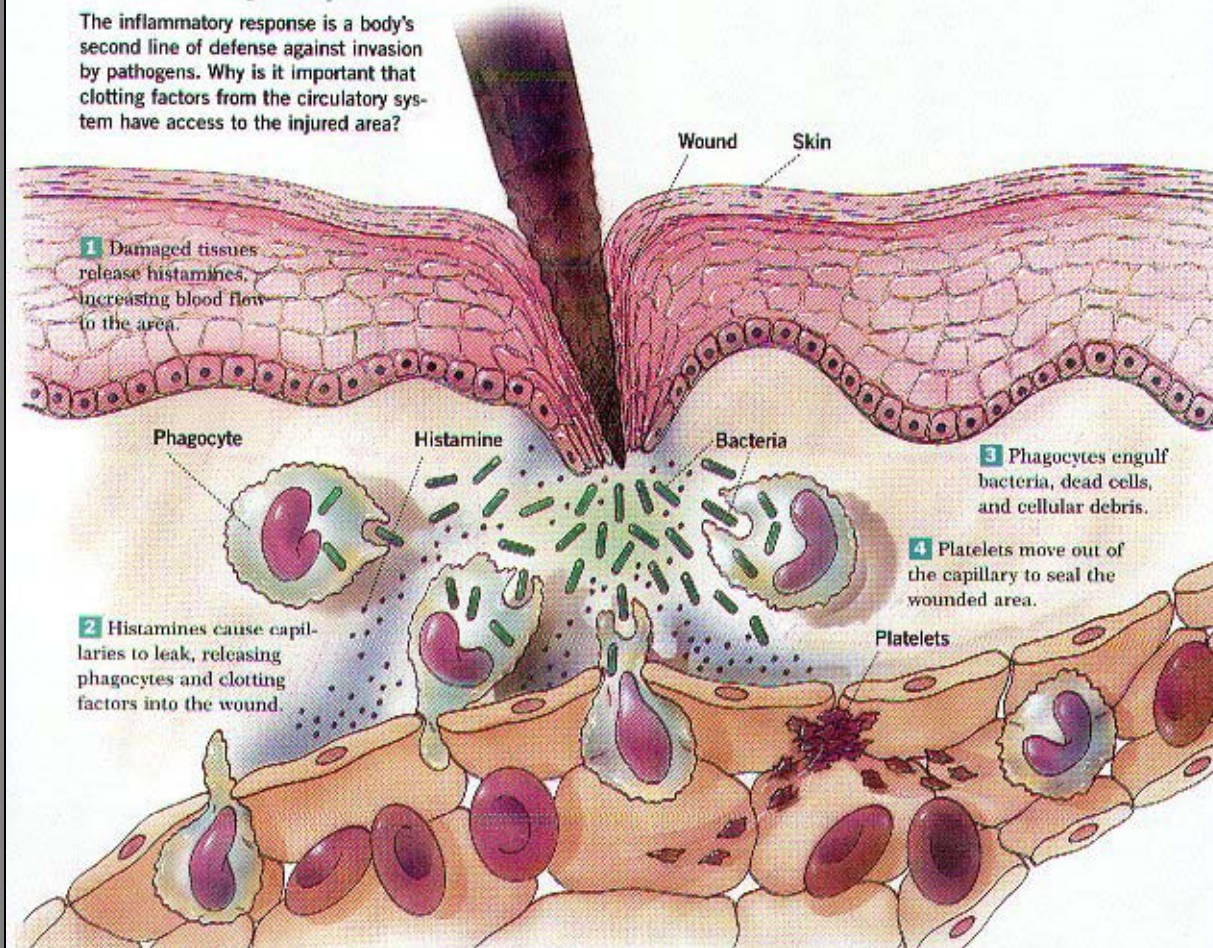




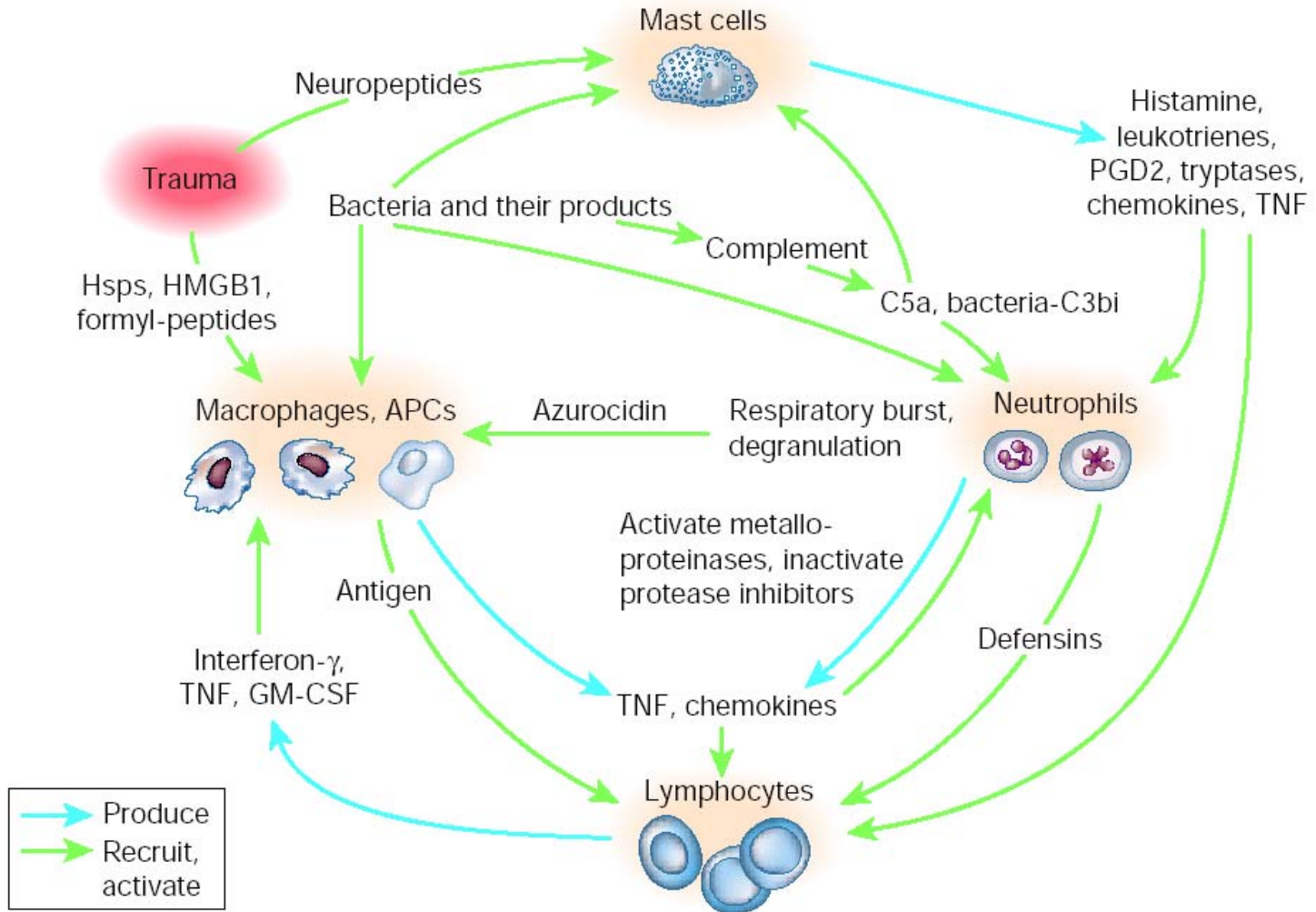
# Inflamación

## Steps of the Inflammatory Response

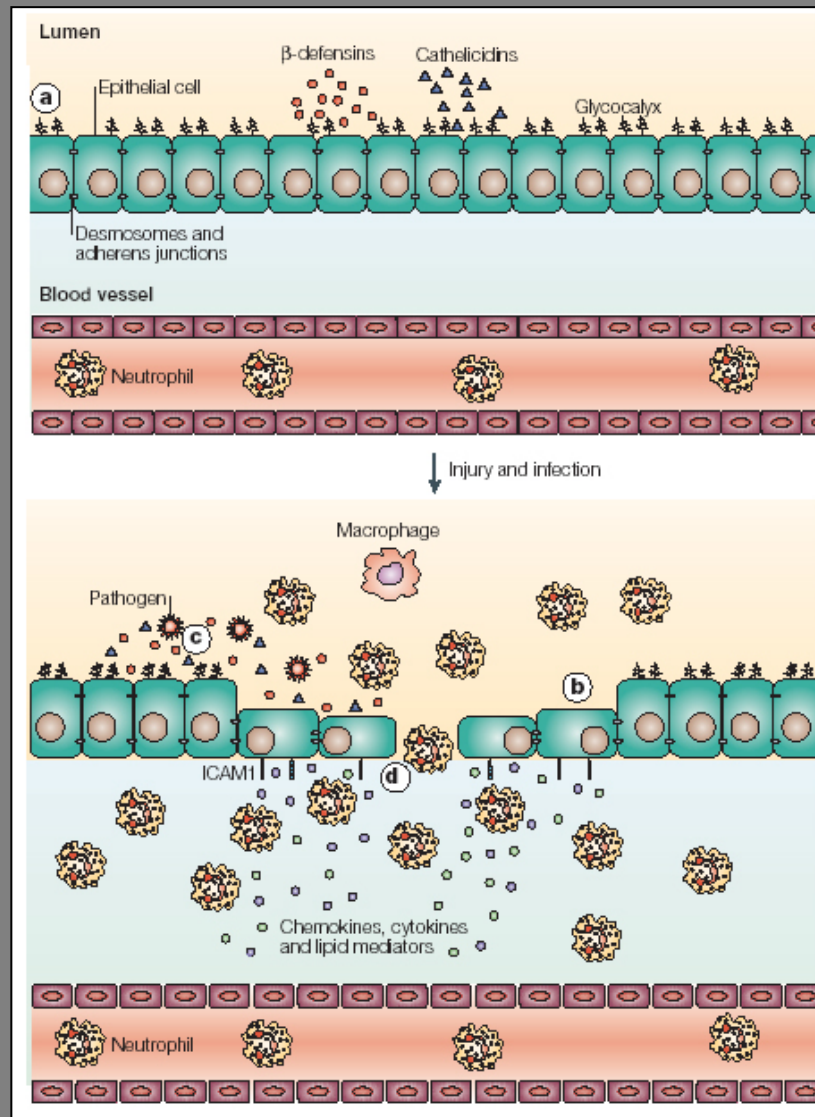
The inflammatory response is a body's second line of defense against invasion by pathogens. Why is it important that clotting factors from the circulatory system have access to the injured area?



# Inflamación

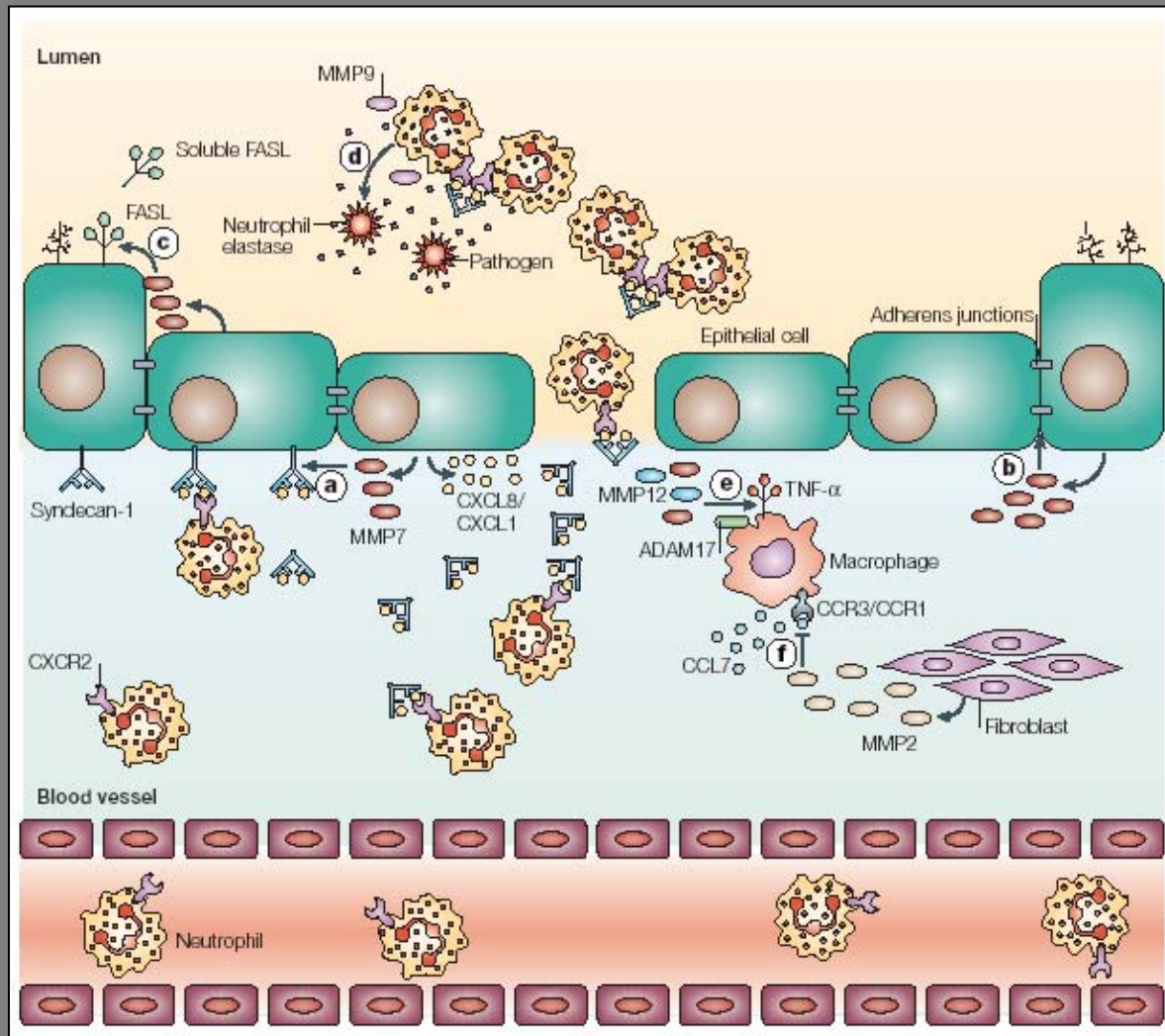


# Inflamación





# Inflamación





## Regulación de la actividad de factores de crecimiento y citoquinas

