



Reparo Tecidual

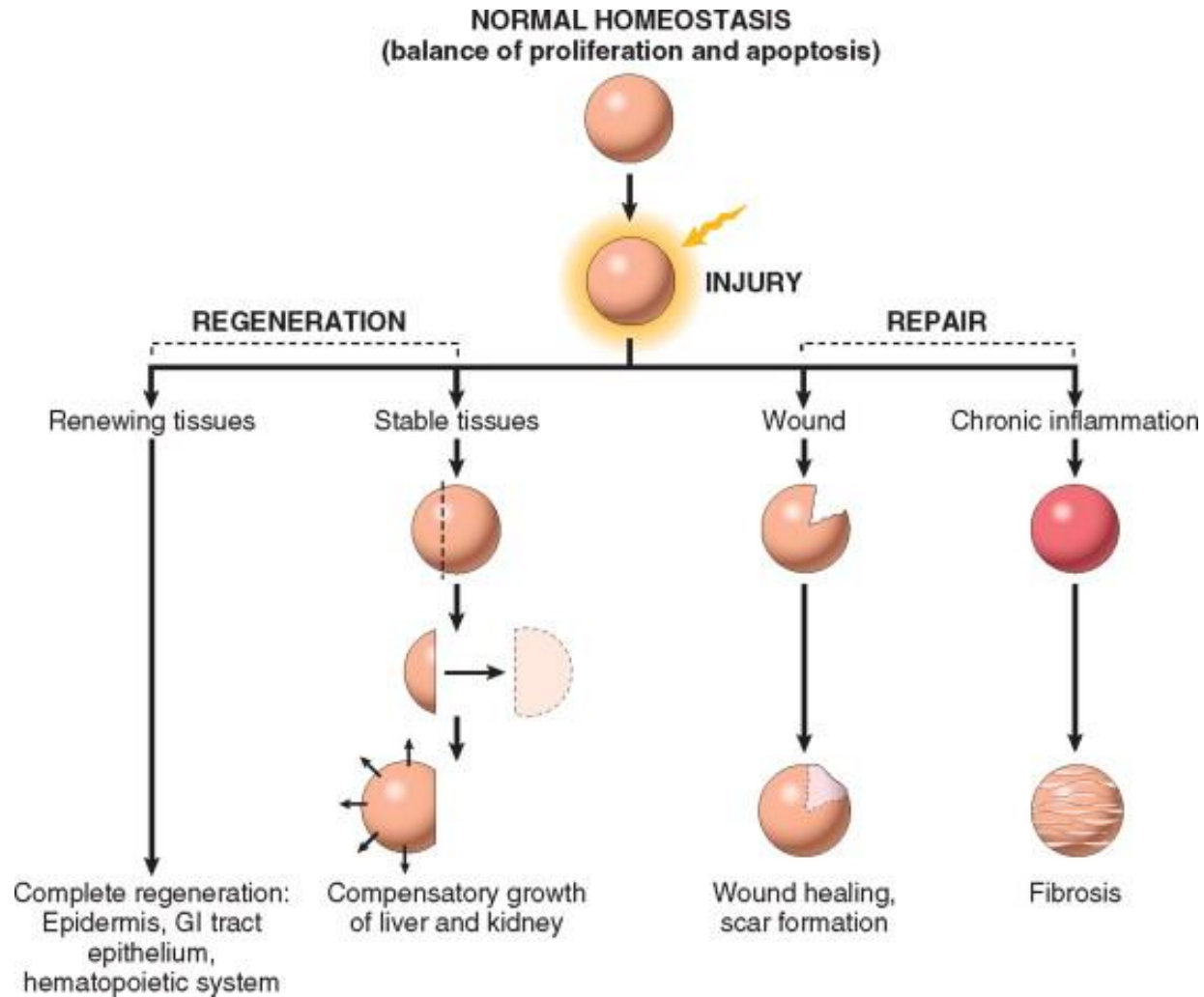
Prof. Dr. Luiz Fernando Ferraz da Silva

Faculdade de Medicina da Universidade de São Paulo – Departamento de Patologia
Faculdade de Odontologia de Bauru – Curso de Medicina

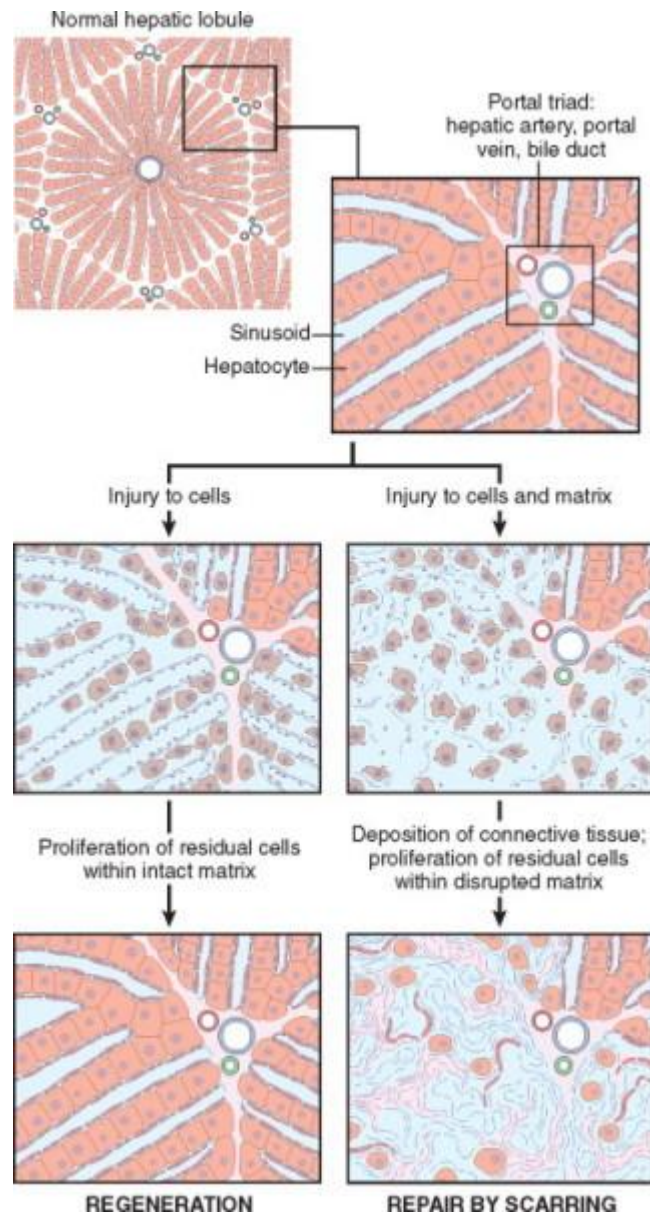


burns@usp.br

Balanço Proliferativo



Células e Arcabouços

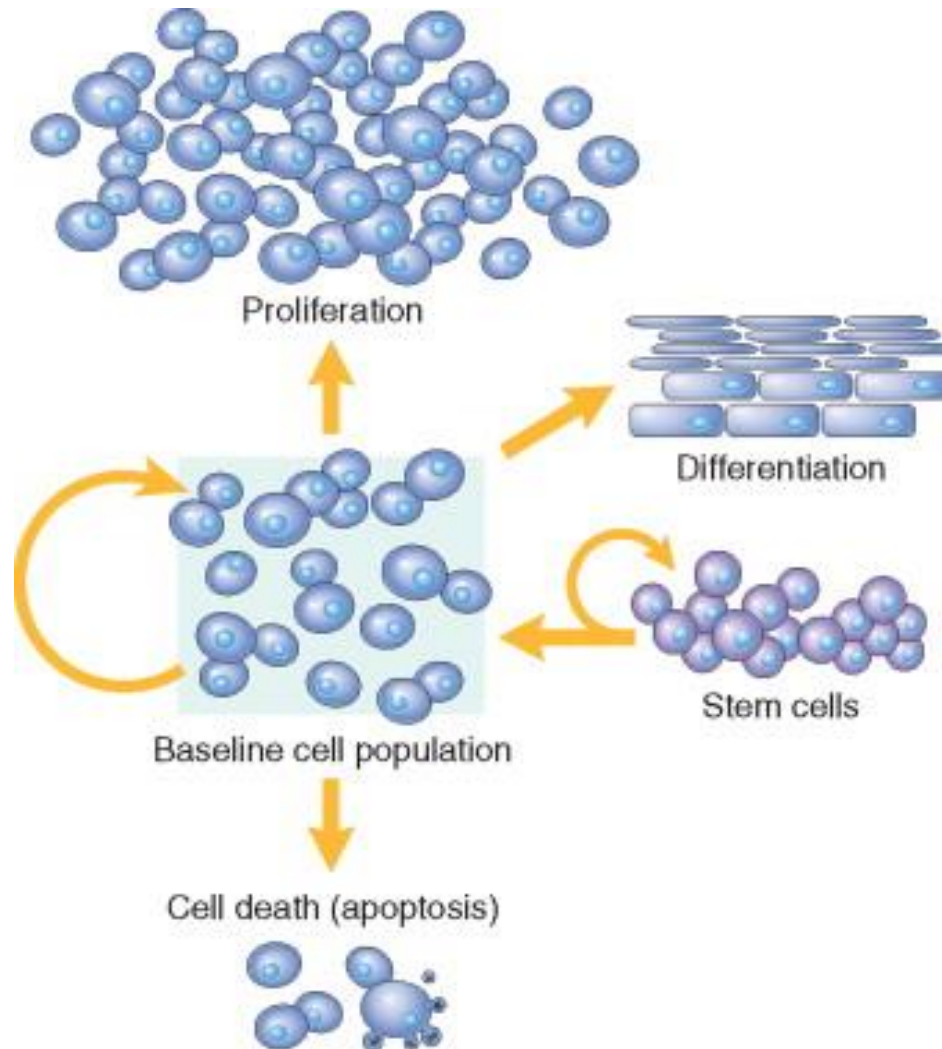


Atividade proliferativa dos tecidos

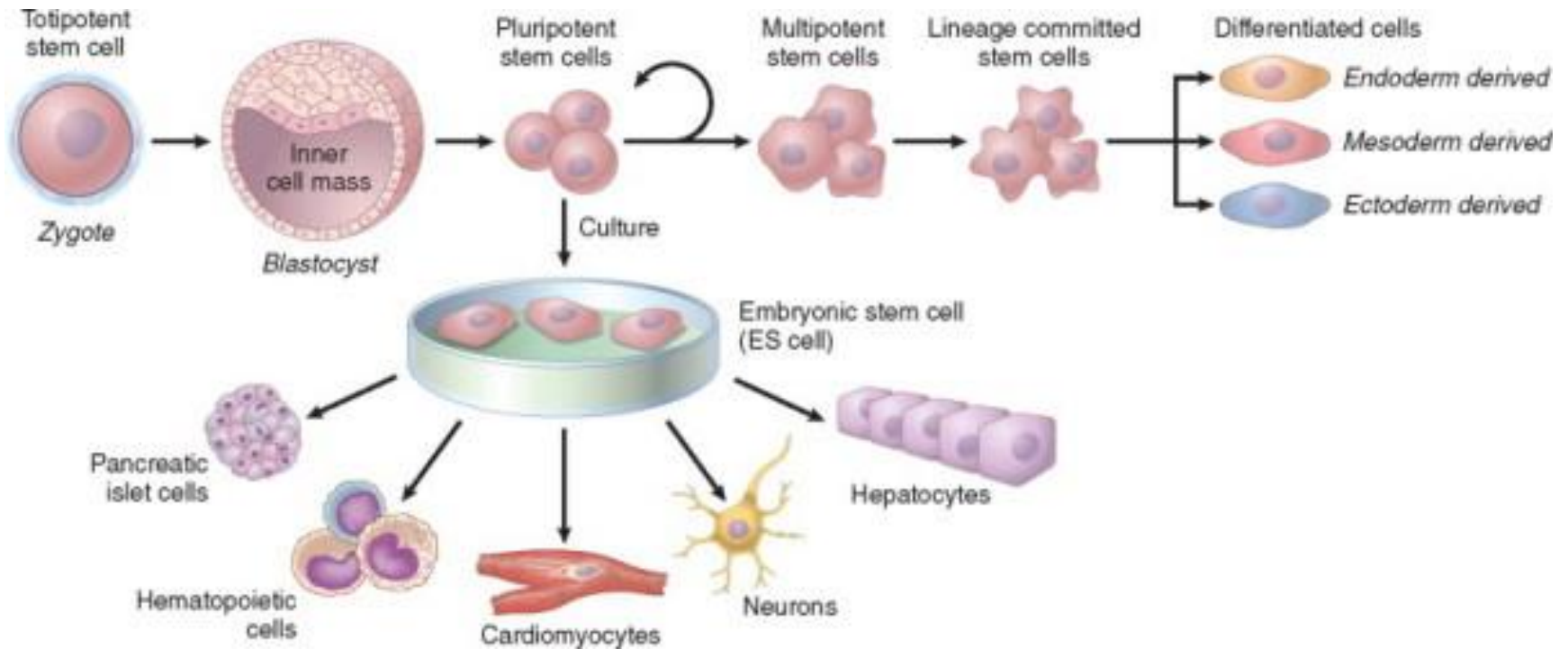
Lábeis

Estáveis

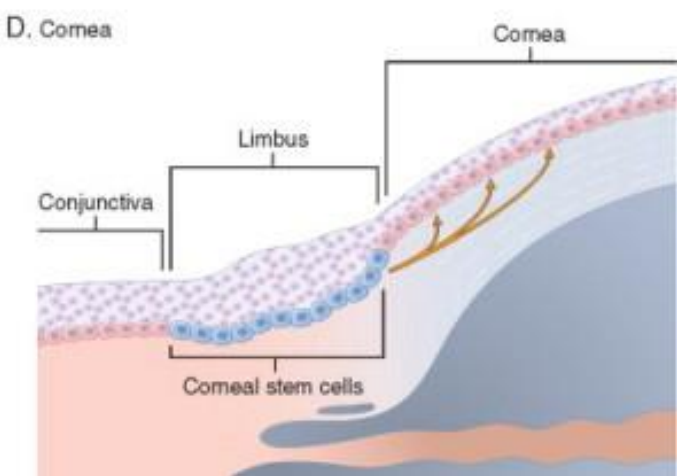
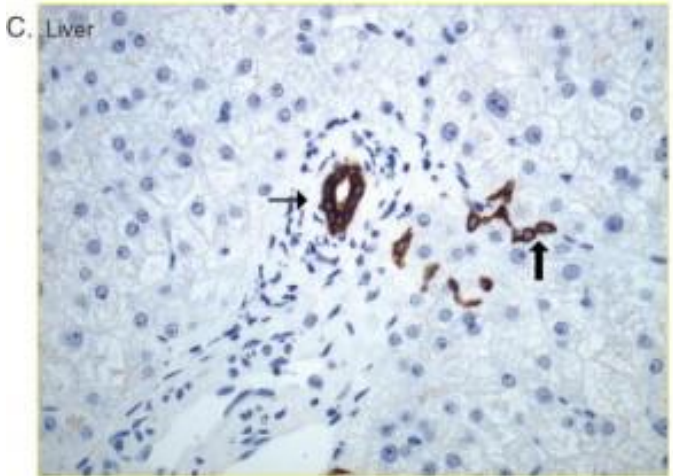
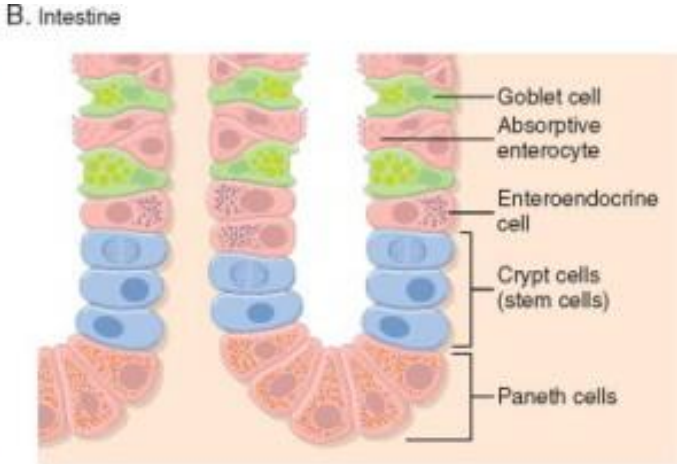
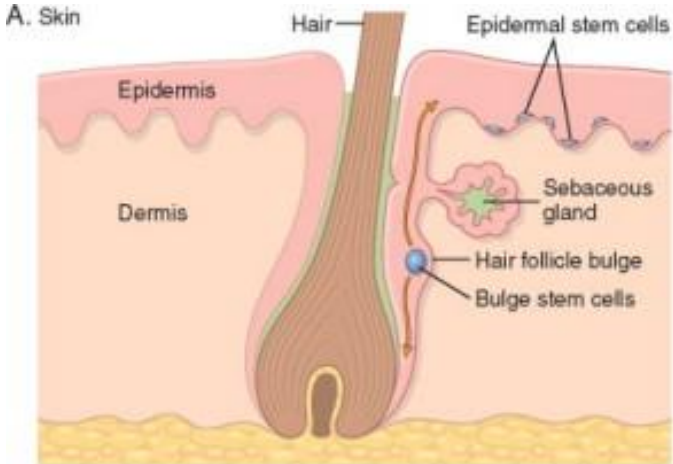
Permanentes



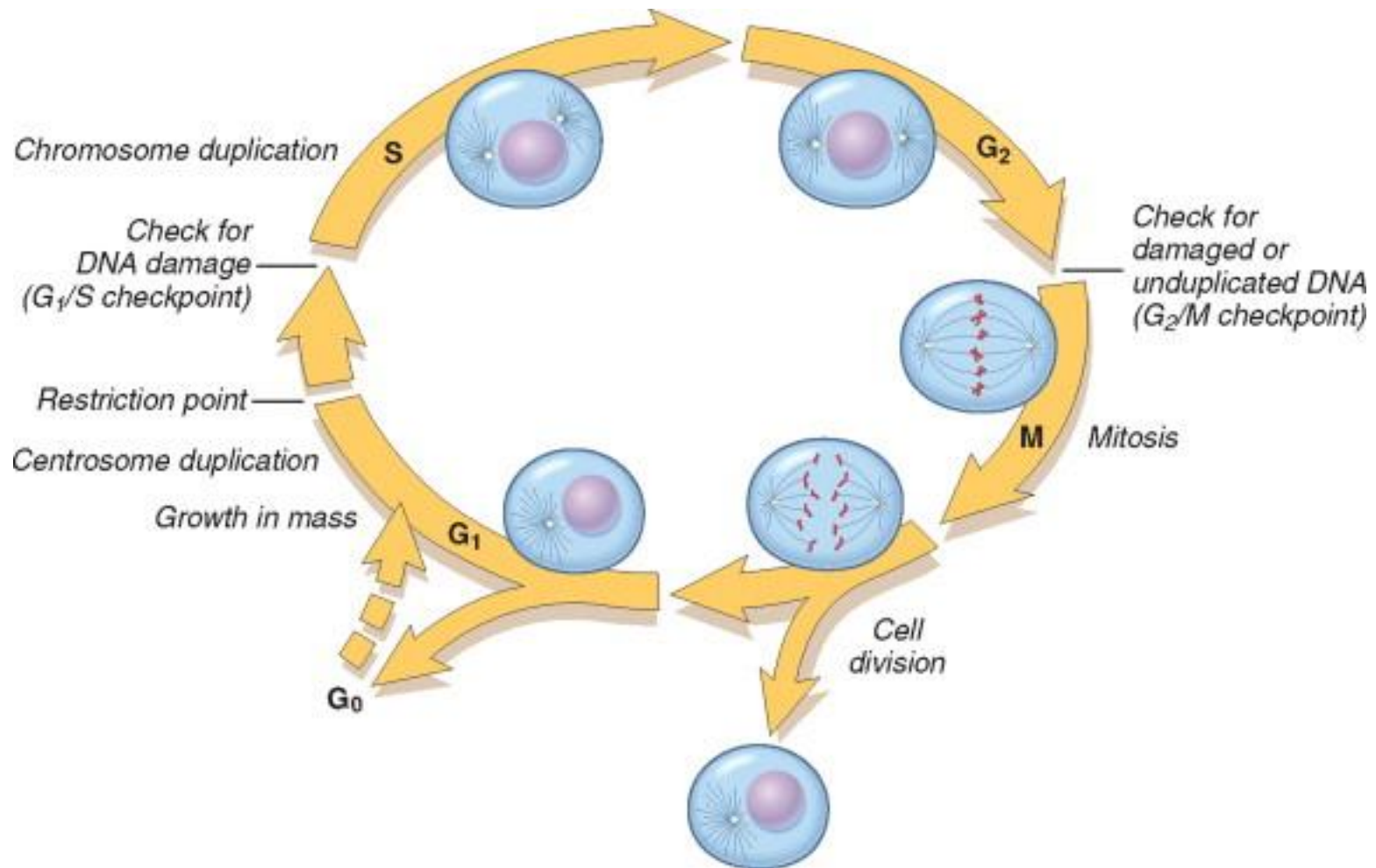
Células Tronco



Células Tronco Somáticas



O Ciclo Celular – Calma, sem traumas!!!



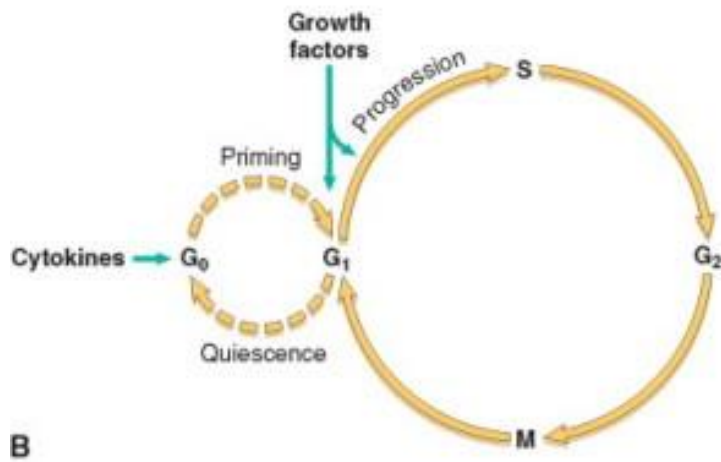
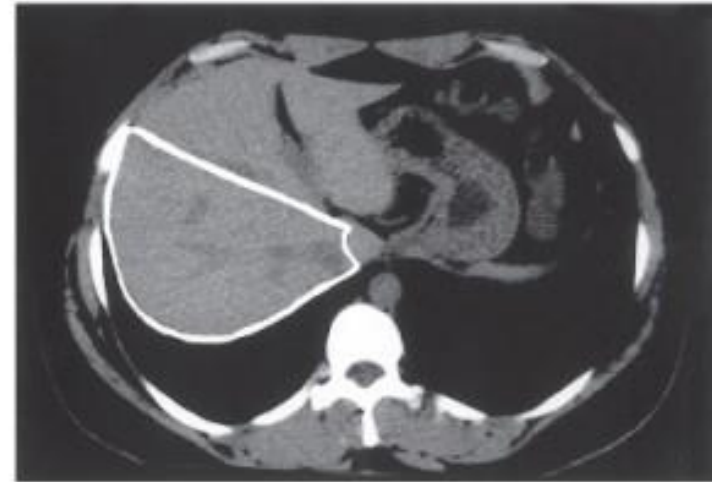
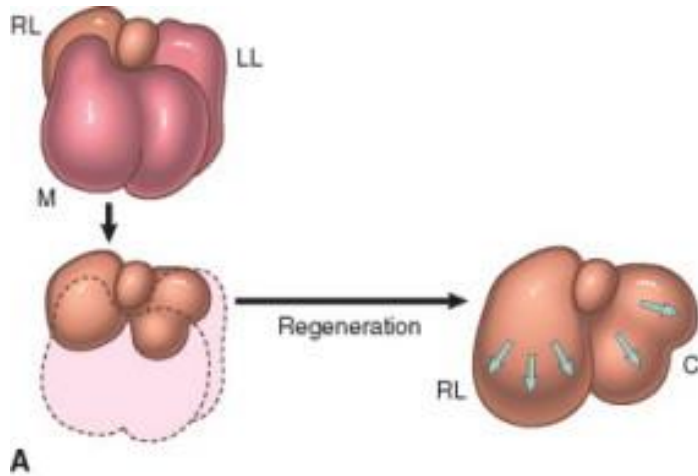
Fatores de Crescimento

Growth Factor	Symbol	Source	Functions
Epidermal growth α	EGF	Platelets, macrophages, saliva, urine, milk, plasma	Mitogenic for keratinocytes and fibroblasts; stimulates keratinocyte migration and granulation tissue formation
Transforming growth factor α	TGF- α	Macrophages, T lymphocytes, keratinocytes, and many tissues	Similar to EGF; stimulates replication of hepatocytes and most epithelial cells
Heparin-binding EGF	HB-EGF	Macrophages, mesenchymal cells	Keratinocyte replication
Hepatocyte growth factor/scatter factor	HGF	Mesenchymal cells	Enhances proliferation of hepatocytes, epithelial cells, and endothelial cells; increases cell motility, keratinocyte replication
Vascular endothelial cell growth factor (isoforms A, B, C, D)	VEGF	Many types of cells	Increases vascular permeability; mitogenic for endothelial cells (see Table 3-3); angiogenesis
Platelet-derived growth factor (isoforms A, B, C, D)	PDGF	Platelets, macrophages, endothelial cells, keratinocytes, smooth muscle cells	Chemotactic for PMNs, macrophages, fibroblasts, and smooth muscle cells; activates PMNs, macrophages, and fibroblasts; mitogenic for fibroblasts, endothelial cells, and smooth muscle cells; stimulates production of MMPs, fibronectin, and HA; stimulates angiogenesis and wound contraction
Fibroblast growth factor 1 (acidic), 2 (basic), and family	FGF	Macrophages, mast cells, T lymphocytes, endothelial cells, fibroblasts	Chemotactic for fibroblasts; mitogenic for fibroblasts and keratinocytes; stimulates keratinocyte migration, angiogenesis, wound contraction, and matrix deposition
Transforming growth factor β (isoforms 1, TGF- β 2, 3); other members of the family are BMPs and activin		Platelets, T lymphocytes, macrophages, endothelial cells, keratinocytes, smooth muscle cells, fibroblasts	Chemotactic for PMNs, macrophages, lymphocytes, fibroblasts, and smooth muscle cells; stimulates TIMP synthesis, angiogenesis, and fibroplasia; inhibits production of MMPs and keratinocyte proliferation
Keratinocyte growth factor (also called FGF-7)	KGF	Fibroblasts	Stimulates keratinocyte migration, proliferation, and differentiation
Tumor necrosis factor	TNF	Macrophages, mast cells, T lymphocytes	Activates macrophages; regulates other cytokines; multiple functions

E o que o médico tem a ver com isso?

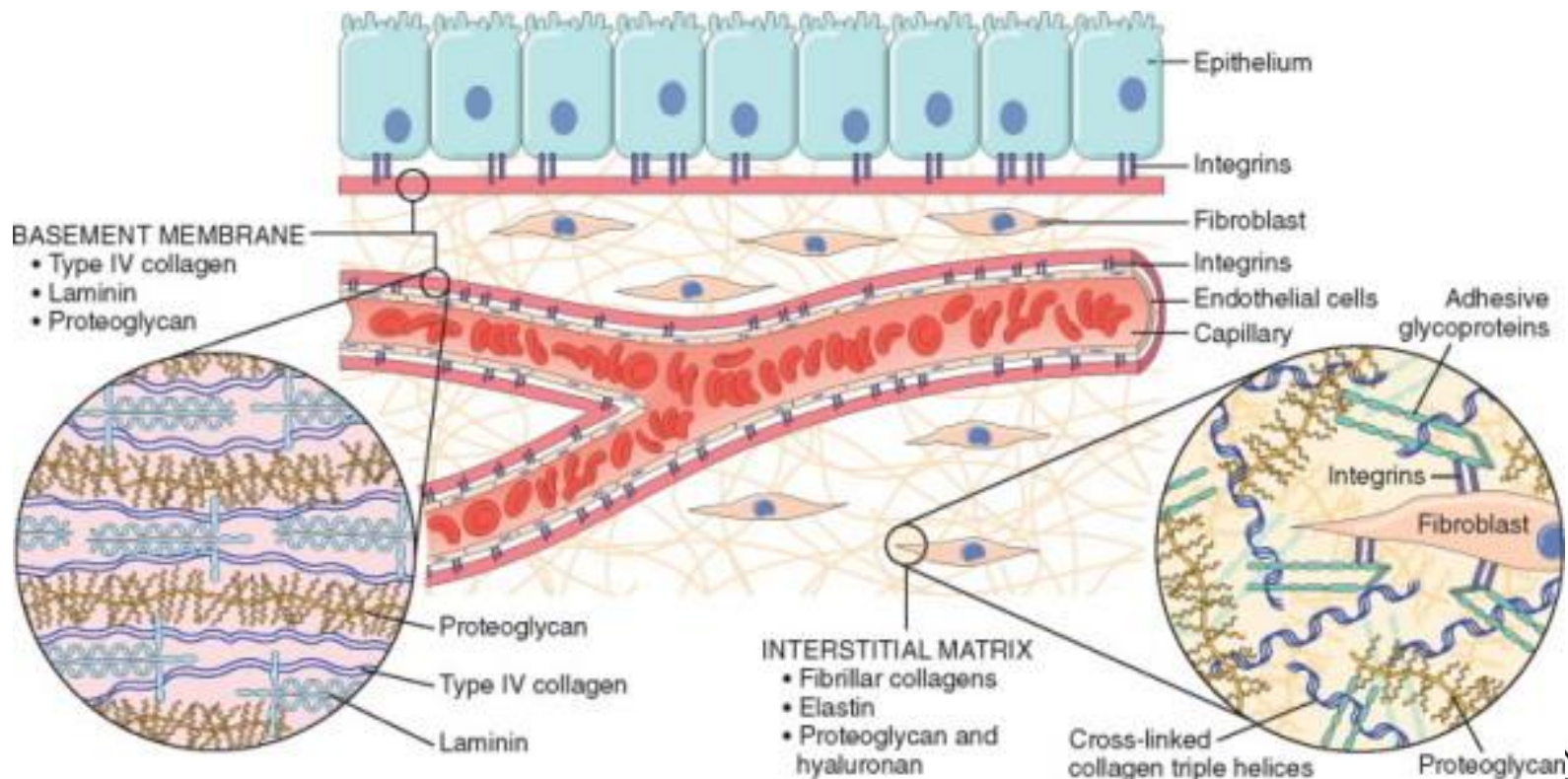
Growth Factor	Symbol	Importância prática	Functions
Epidermal growth α	EGF	HER2 / HER2-Neu	Mitogenic for keratinocytes and fibroblasts; stimulates keratinocyte migration and granulation tissue formation
Transforming growth factor α	TGF- α		Similar to EGF; stimulates replication of hepatocytes and most epithelial cells
Heparin-binding EGF	HB-EGF		Keratinocyte replication
Hepatocyte growth factor/scatter factor	HGF		Enhances proliferation of hepatocytes, epithelial cells, and endothelial cells; increases cell motility, keratinocyte replication
Vascular endothelial cell growth factor (isoforms A, B, C, D)	VEGF	Vasos – proliferações e nutrição tumoral	Increases vascular permeability; mitogenic for endothelial cells (see Table 3-3); angiogenesis
Platelet-derived growth factor (isoforms A, B, C, D)	PDGF		Chemotactic for PMNs, macrophages, fibroblasts, and smooth muscle cells; activates PMNs, macrophages, and fibroblasts; mitogenic for fibroblasts, endothelial cells, and smooth muscle cells; stimulates production of MMPs, fibronectin, and HA; stimulates angiogenesis and wound contraction
Fibroblast growth factor 1 (acidic), 2 (basic), and family	FGF	Bloqueio de hipericatrização Fatores hematopóieticos	Chemotactic for fibroblasts; mitogenic for fibroblasts and keratinocytes; stimulates keratinocyte migration, angiogenesis, wound contraction, and matrix deposition
Transforming growth factor β (isoforms 1, TGF- β 2, 3); other members of the family are BMPs and activin		Inibe crescimento celular mas promove fibrose Potencial anti-inflamatório mas aumenta algumas funções imunológicas (Treg)	Chemotactic for PMNs, macrophages, lymphocytes, fibroblasts, and smooth muscle cells; stimulates TIMP synthesis, angiogenesis, and fibroplasia; inhibits production of MMPs and keratinocyte proliferation
Keratinocyte growth factor (also called FGF-7)	KGF		Stimulates keratinocyte migration, proliferation, and differentiation
Tumor necrosis factor	TNF	É clínica pura	Activates macrophages; regulates other cytokines; multiple functions

Regeneração x Reparo

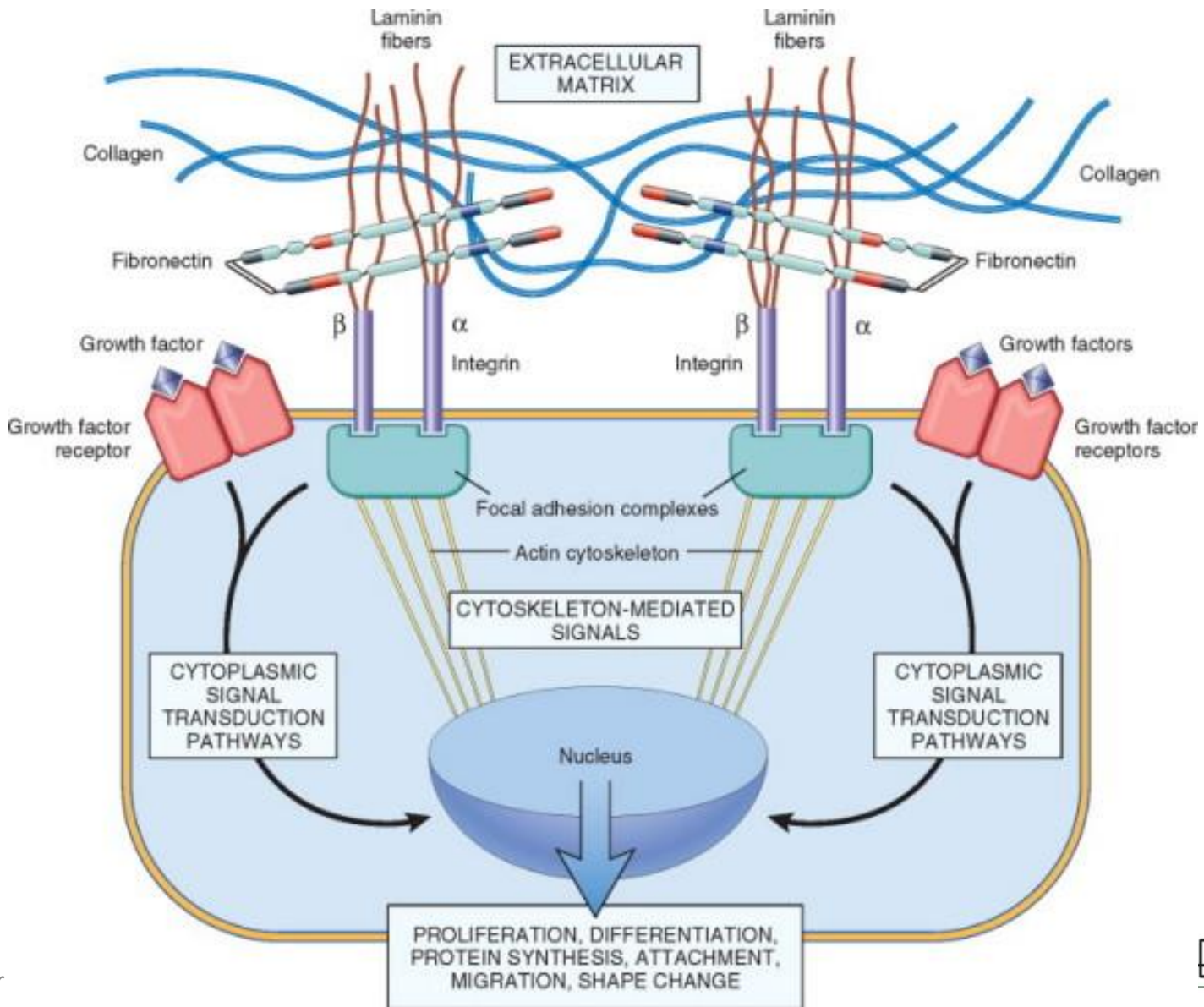


Matriz Extracelular

- Suporte mecânico
- Controle de crescimento
- Manutenção da diferenciação
- Base para regeneração / reparo
- Microambientes teciduais
- Armazenamento de moléculas regulat

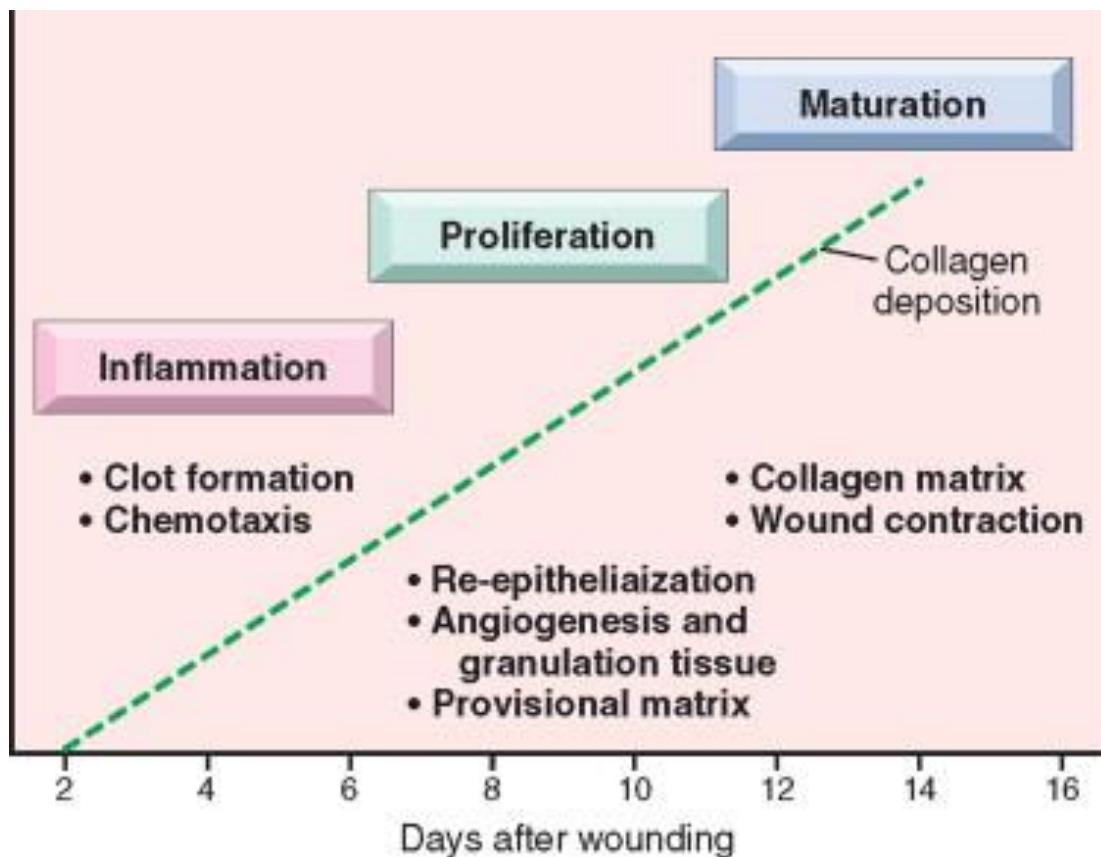


Matriz Extracelular



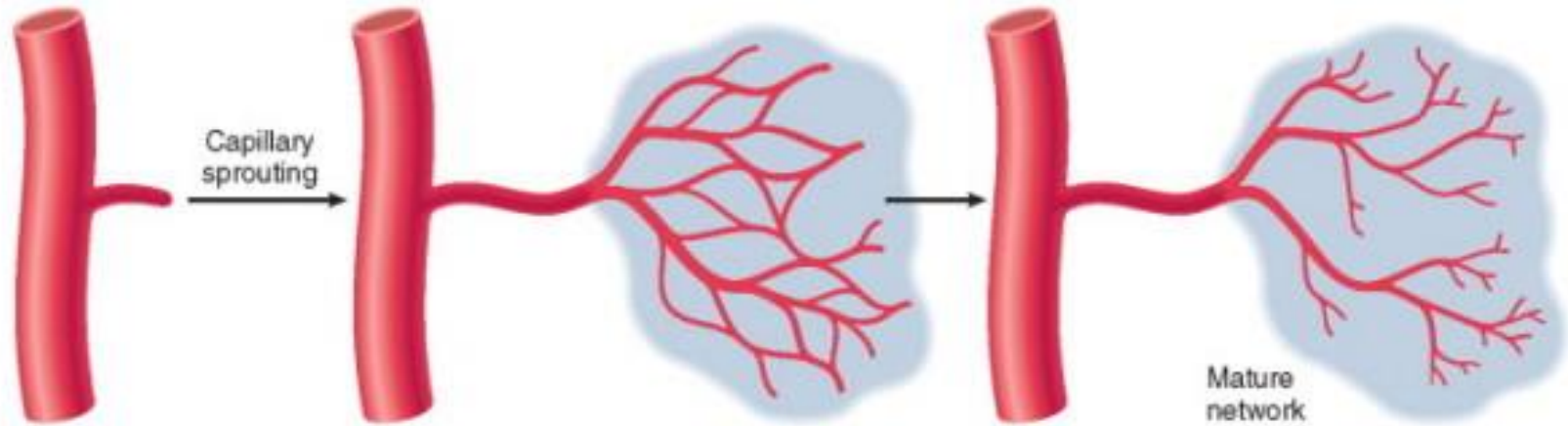
Reparo e cicatrização

- Inflamação
- Angiogênese
- Migração e proliferação de fibroblastos
- Formação da cicatriz
- Remodelamento

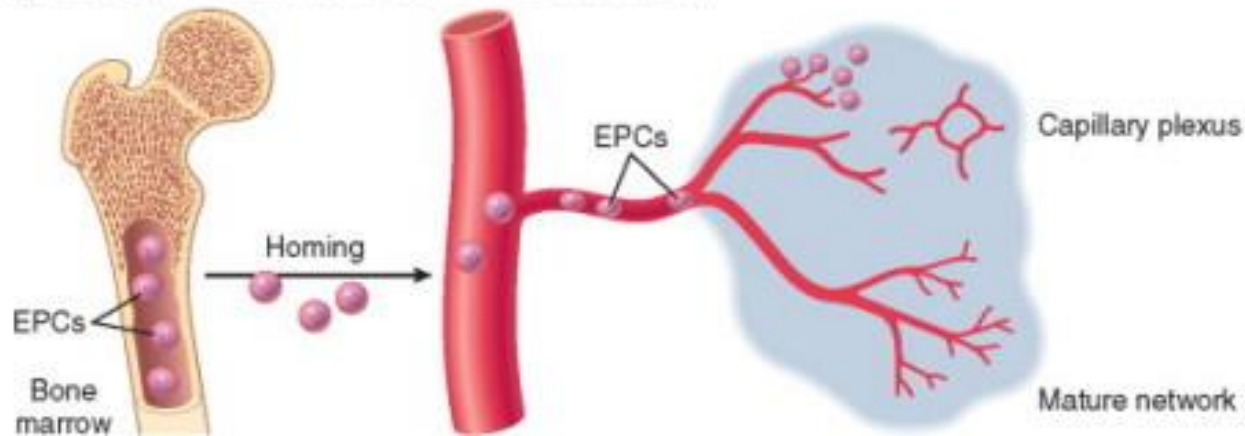


Angiogênese

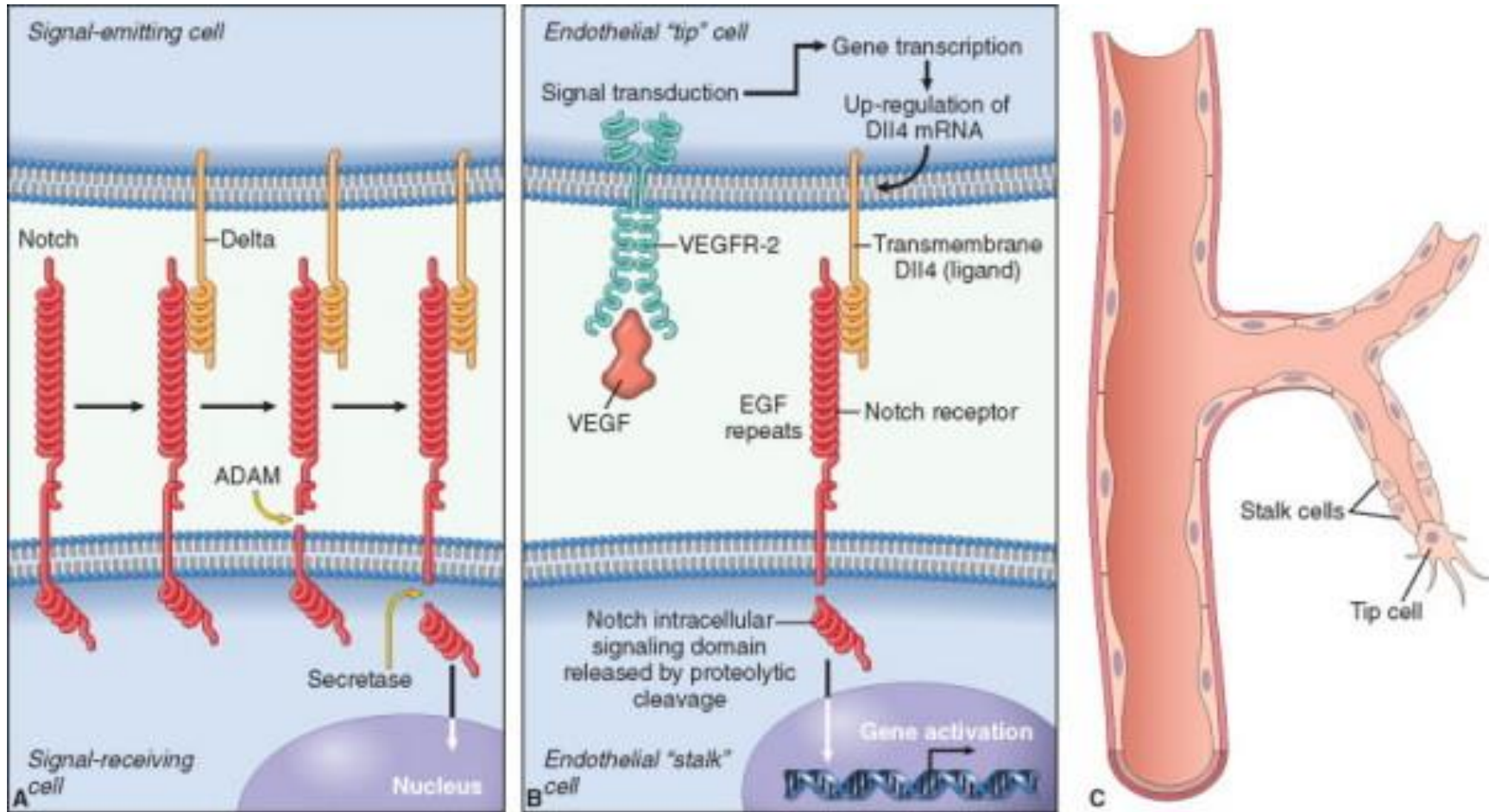
A. Angiogenesis from pre-existing vessels



B. Angiogenesis by mobilization of EPCs from the bone marrow



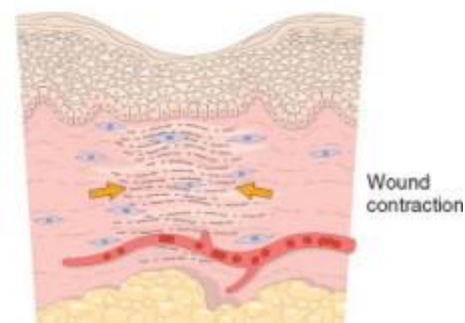
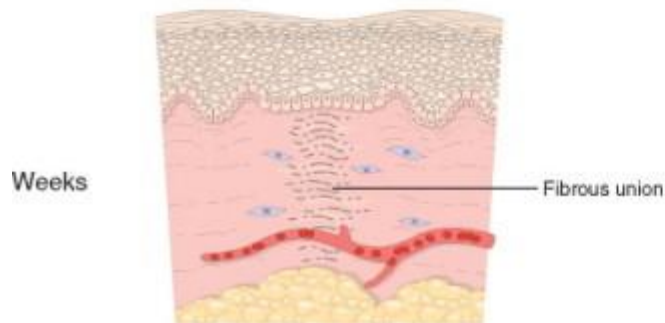
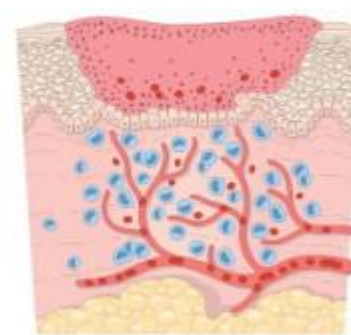
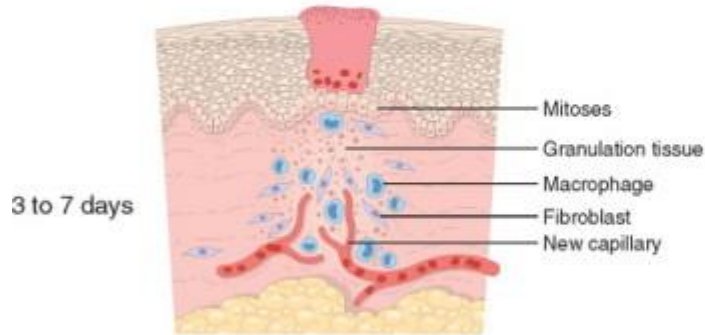
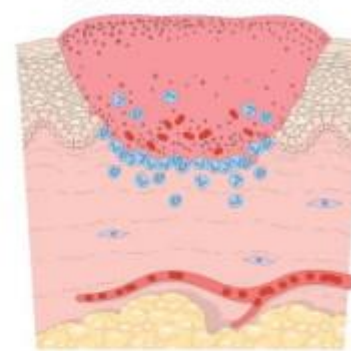
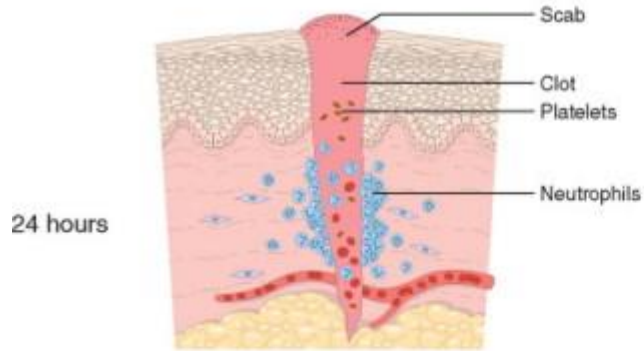
Angiogenesis – Sinalização Notch / DLL4



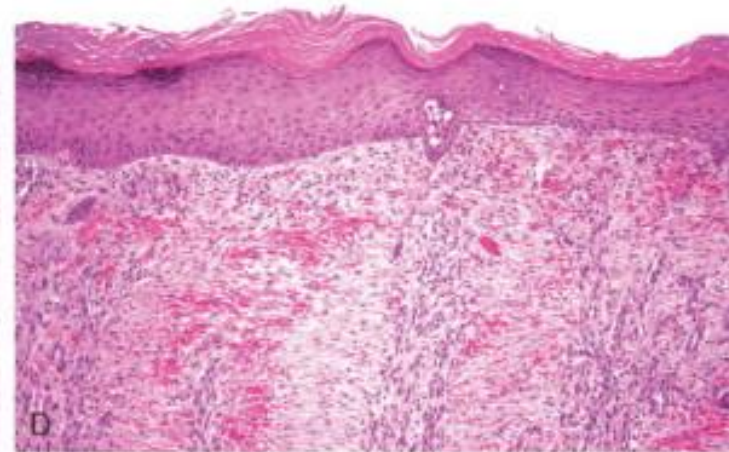
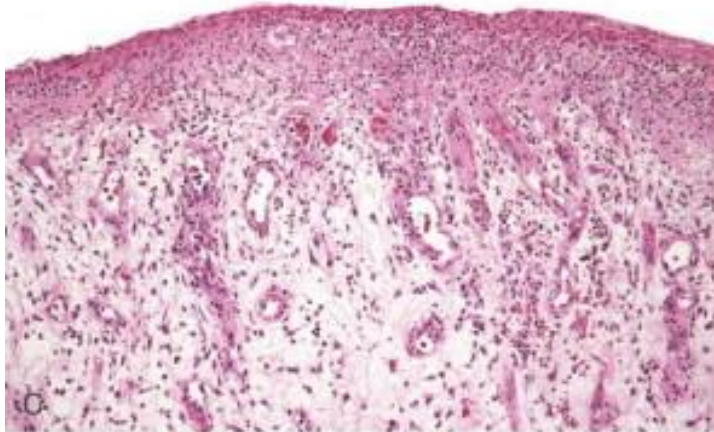
Cicatrização de Feridas

A. HEALING OF THIN WOUND

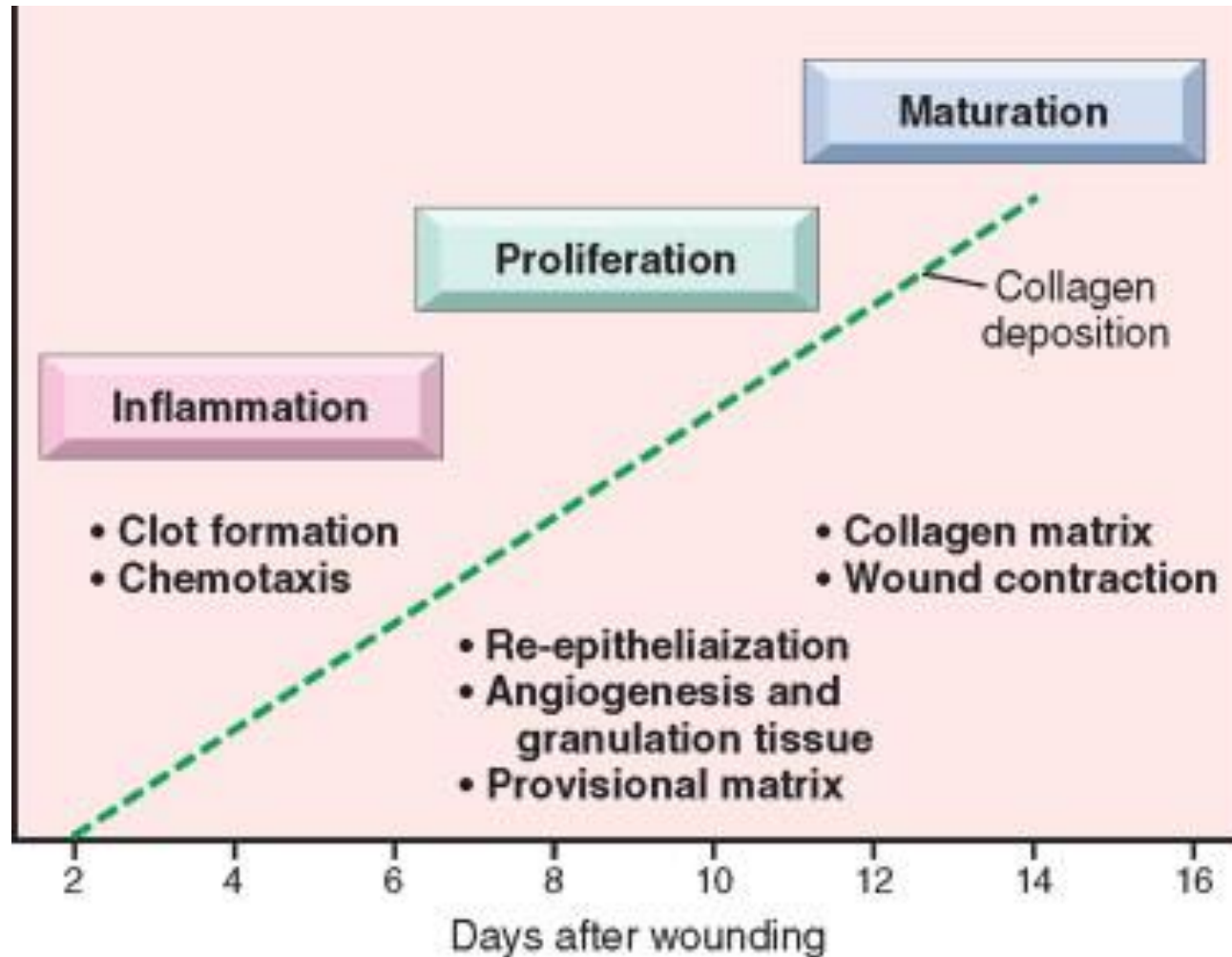
B. HEALING WITH SCAR FORMATION AND CONTRACTION



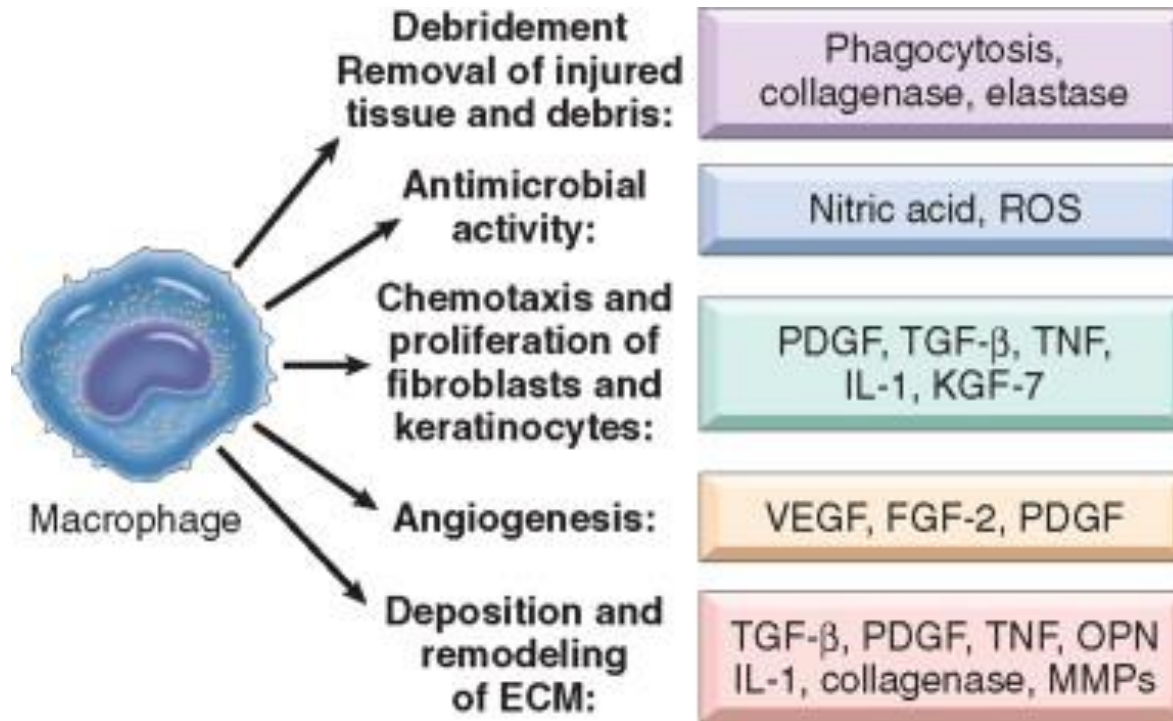
Cicatrização de Feridas



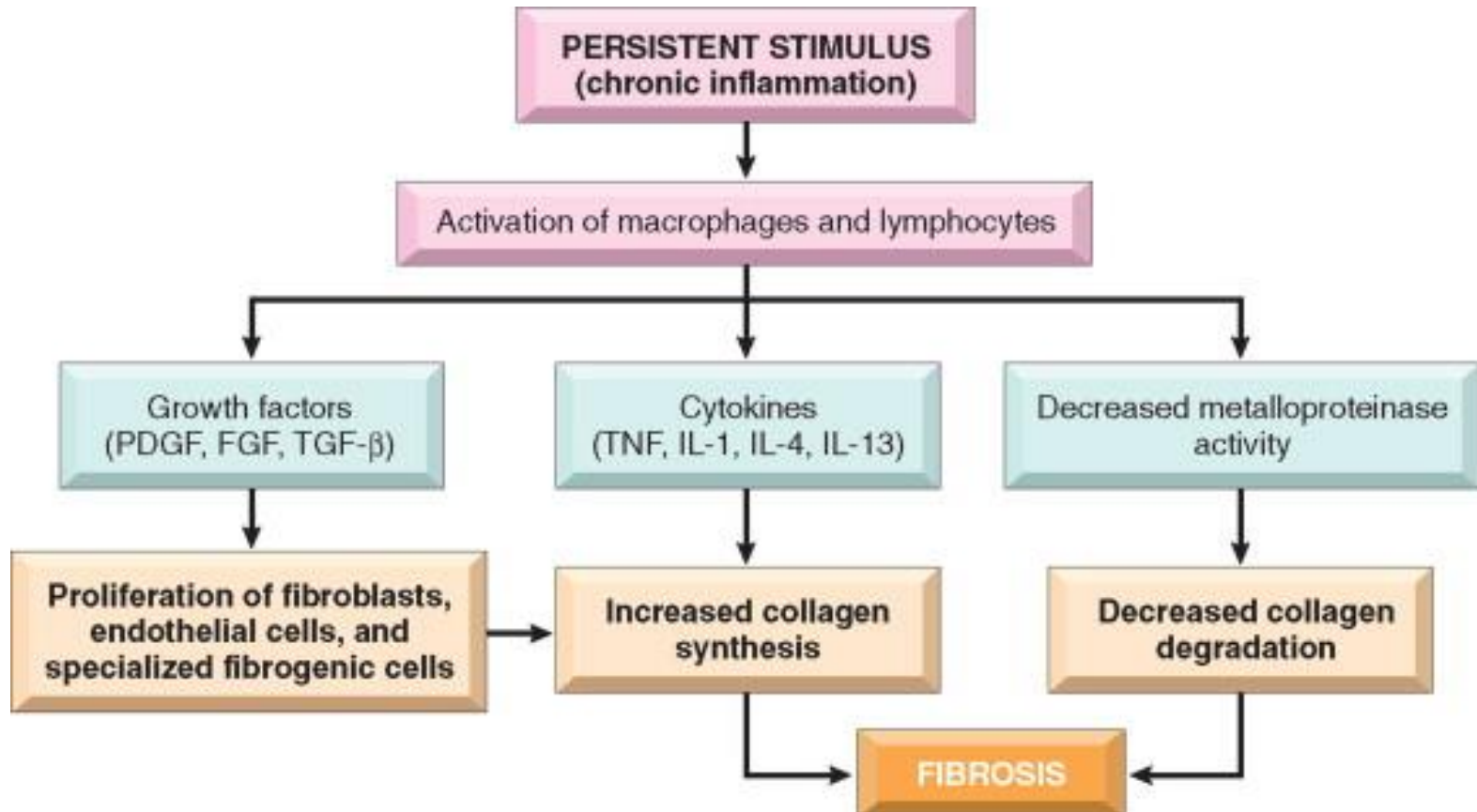
Cicatrização de Feridas



Reparo na Inflamação



Reparo na Inflamação



Reparo na Inflamação

