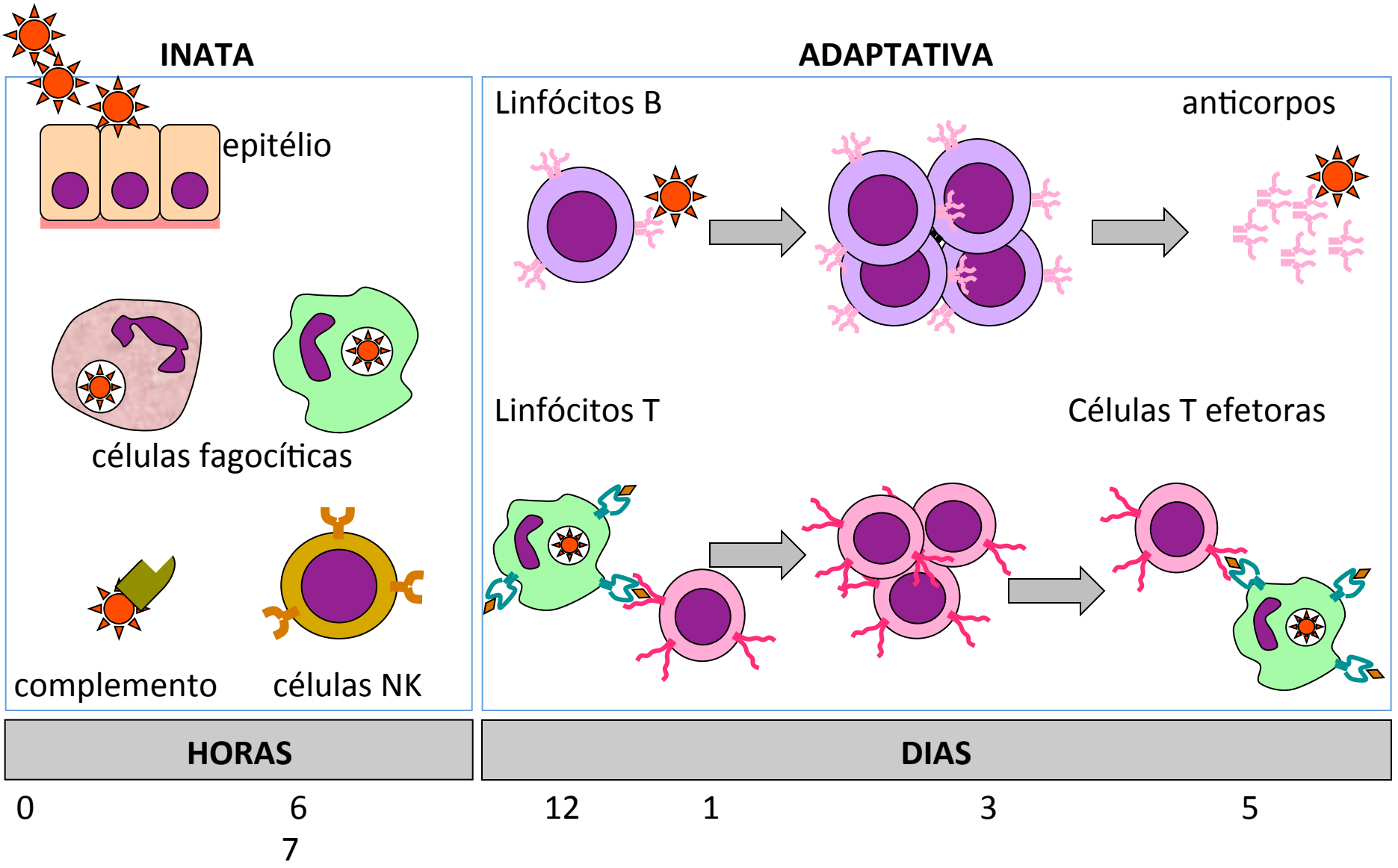
RESPOSTAS INATAS
INFLAMAÇÃO

BMI0256

AULA #2

TIPOS DE RESPOSTA



PRINCIPAIS CARACTERÍSTICAS

RÁPIDA

DISTRIBUÍDA POR TODO O ORGANISMO

DISTINÇÃO ENTRE PRÓPRIO E NÃO PRÓPRIO

RECEPTORES PARA PATÓGENOS CODIFICADOS PELAS LINHAGENS GERMINATIVAS

SINALIZAÇÃO, AMPLIFICAÇÃO

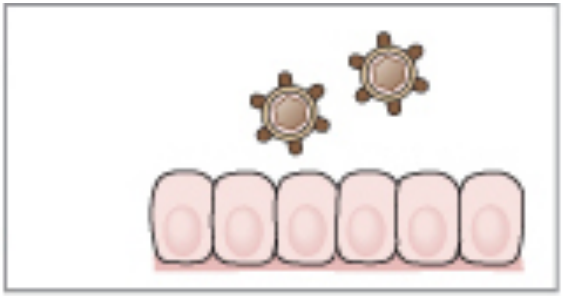
TÓPICOS DISCUTIDOS NESSA AULA

-BARREIRAS FÍSICAS
    -EPITÉLIO
-BARREIRAS QUÍMICAS
    -PEPTÍDEOS COM ATIVIDADE MICROBICIDA
    -SISTEMA COMPLEMENTO

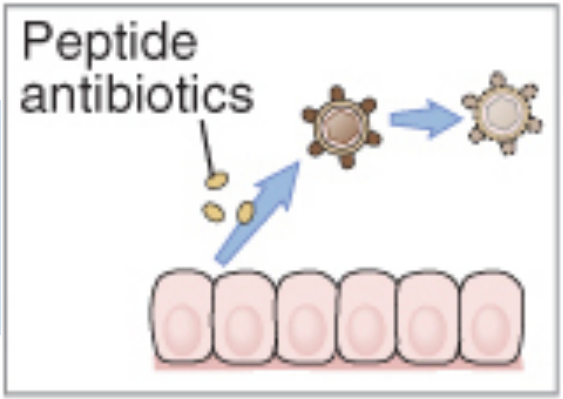
    -ELEMENTOS CELULARES E SEUS RECEPTORES
    -VIGILÂNCIA IMUNOLÓGICA
    -FAGÓCITOS E RECEPTORES
    -CÉLULAS NK

EPITÉLIO

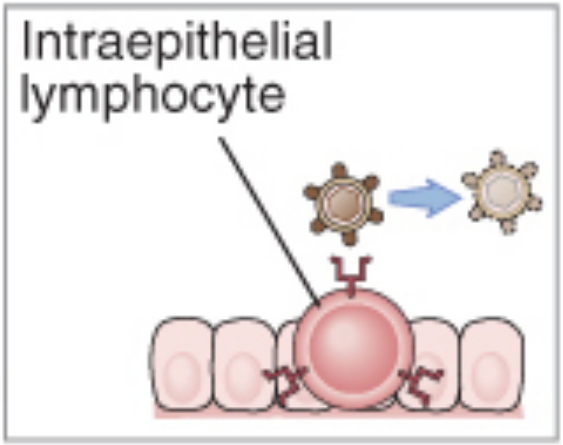
Barreira física contra a entrada de patógenos



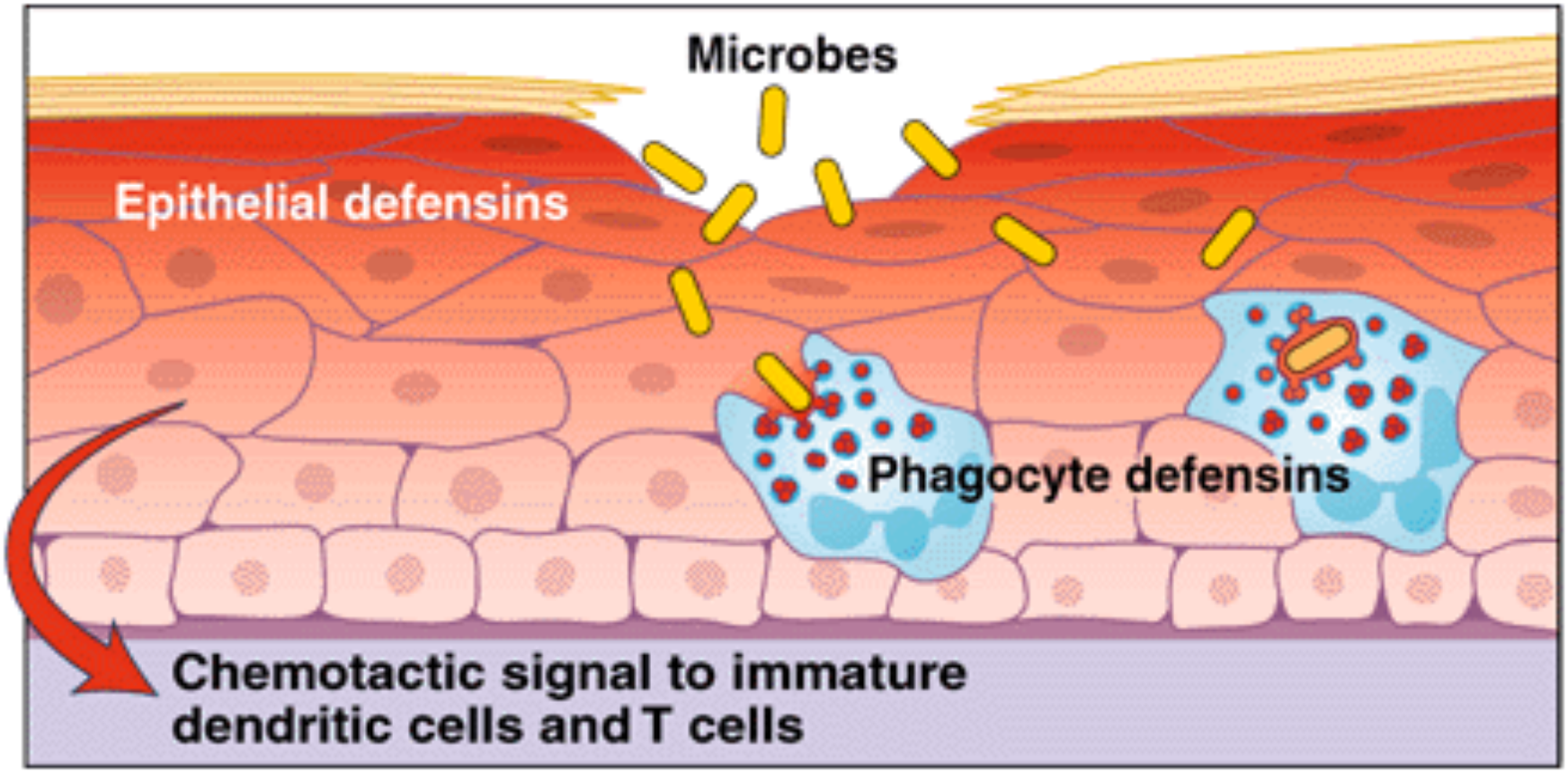
Morte de micróbios por microbicidas produzidos localmente



Morte de micróbios e células infectadas por linfócitos intraepiteliais

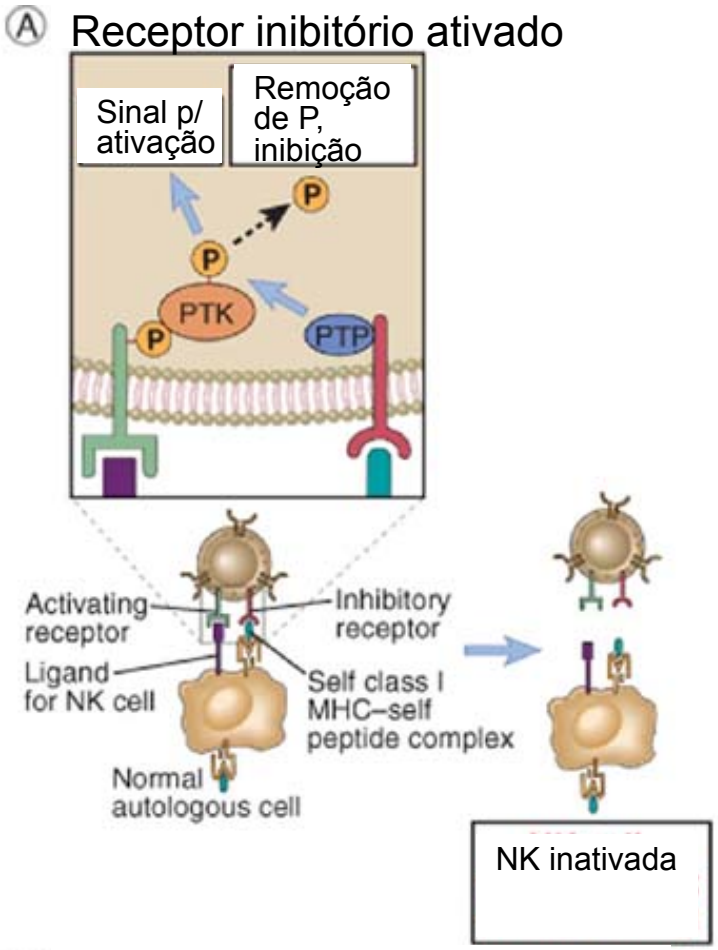


DEFENSINAS


Microbes
Epithelial defensins
Phagocyte defensins
Chemotactic signal to immature dendritic cells and T cells

CÉLULAS E SEUS RECEPTORES

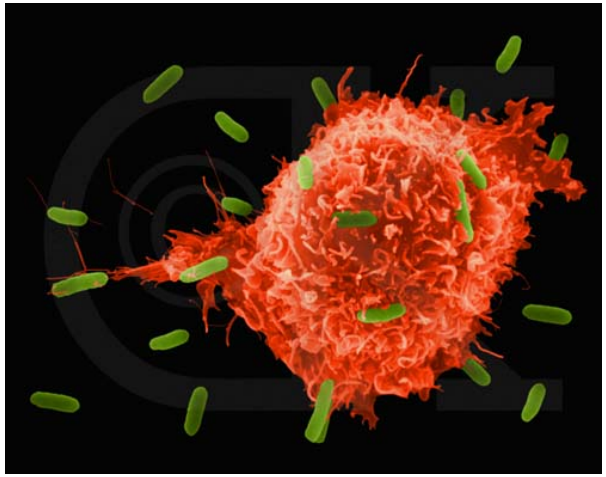
NK – NATURAL KILLER

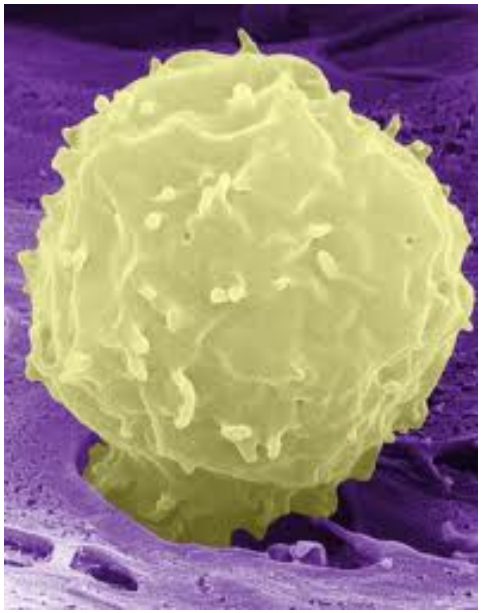


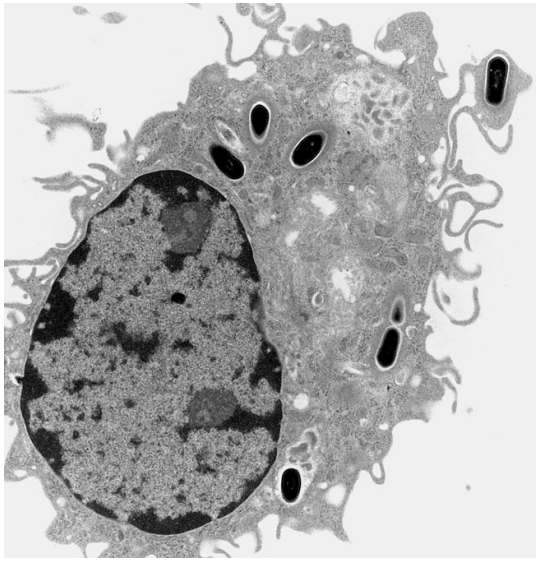
https://www.youtube.com/watch?v=Va1jaBGwoT8

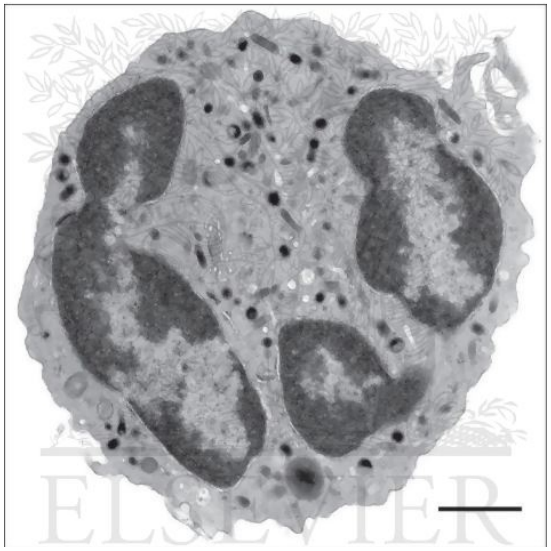
https://www.youtube.com/watch?v=ZHffoSfNKw8

FAGÓCITOS

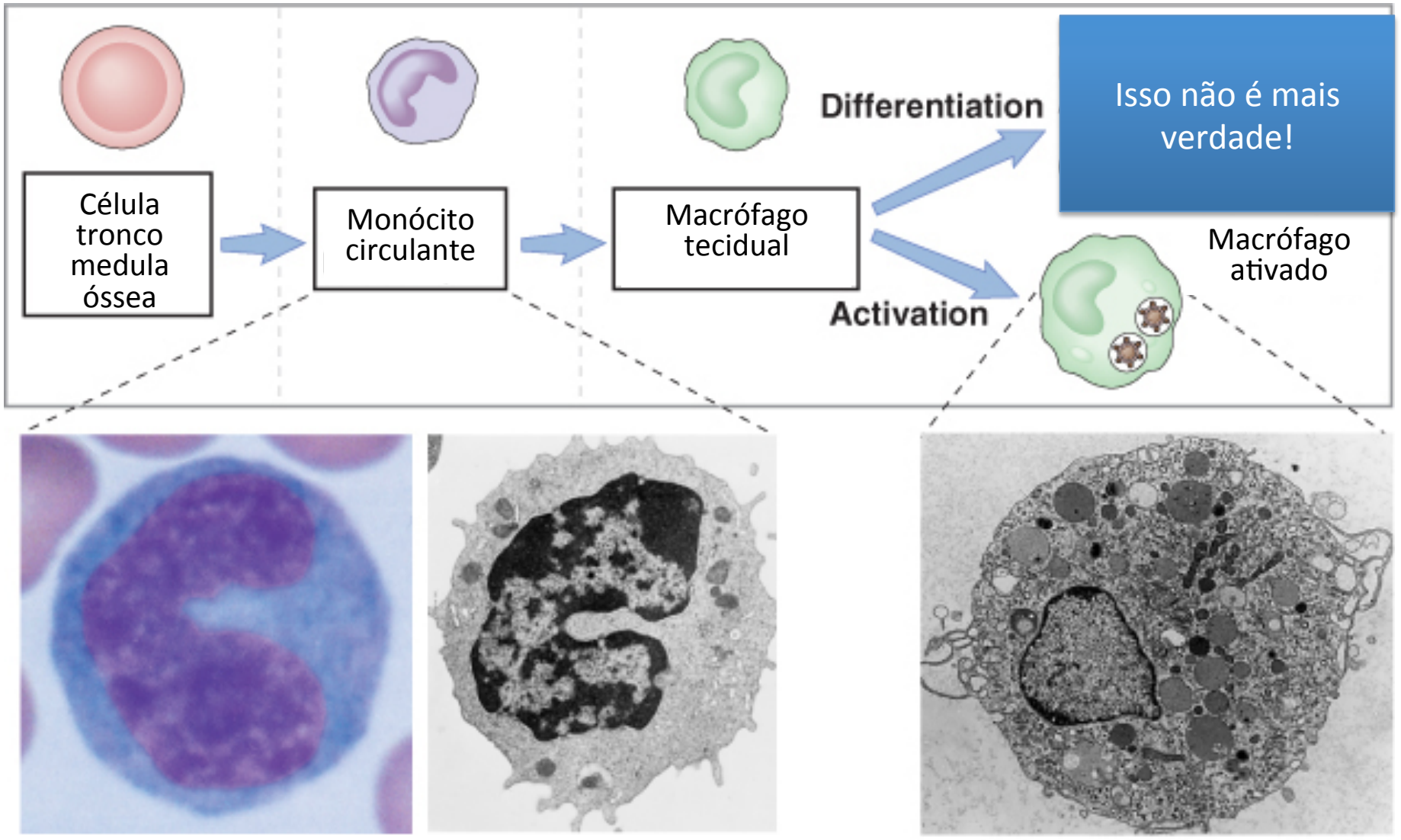




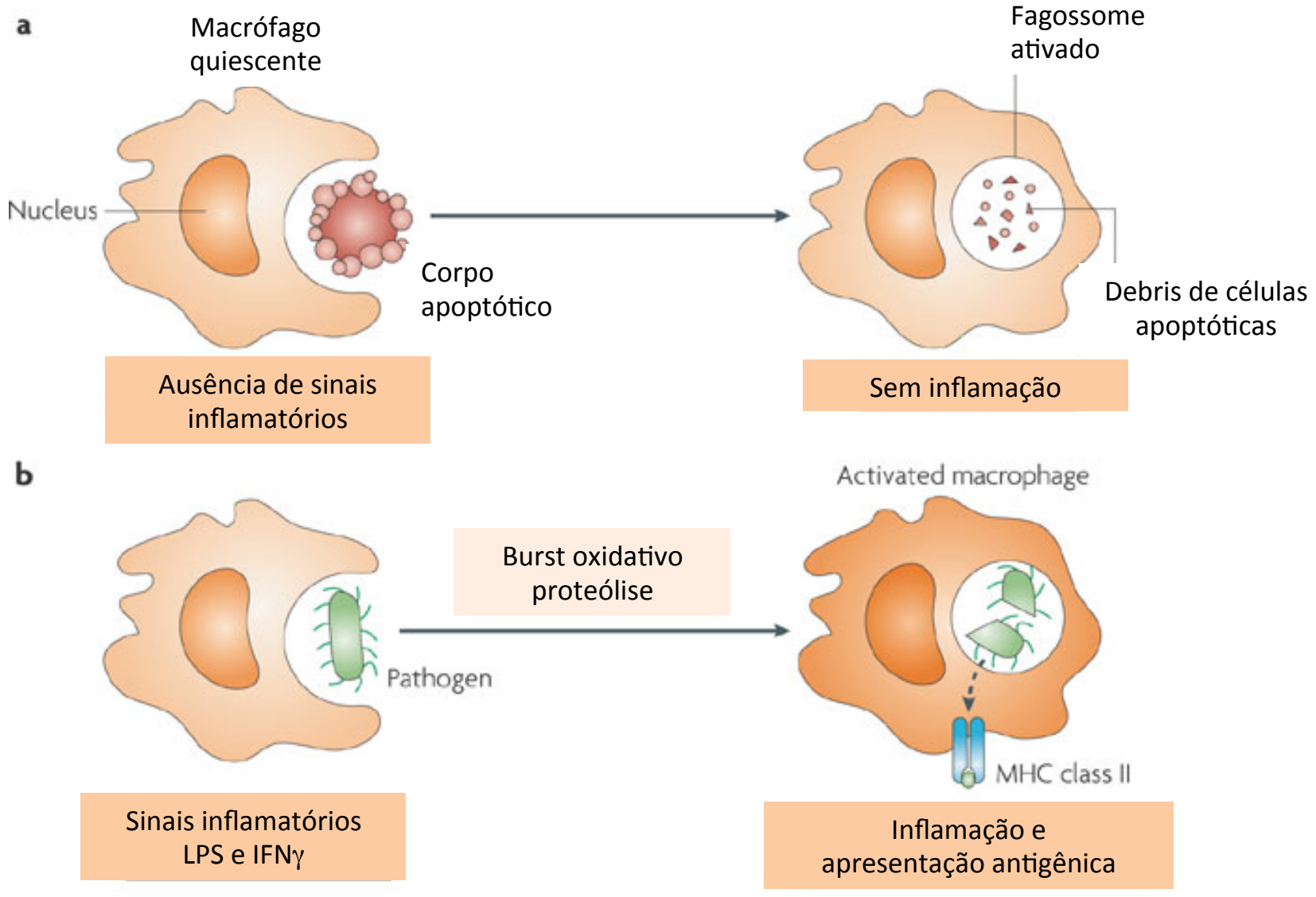




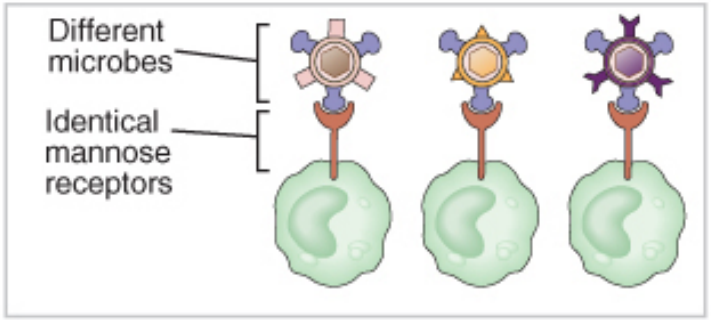
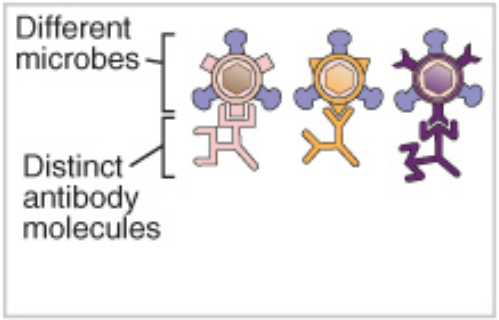
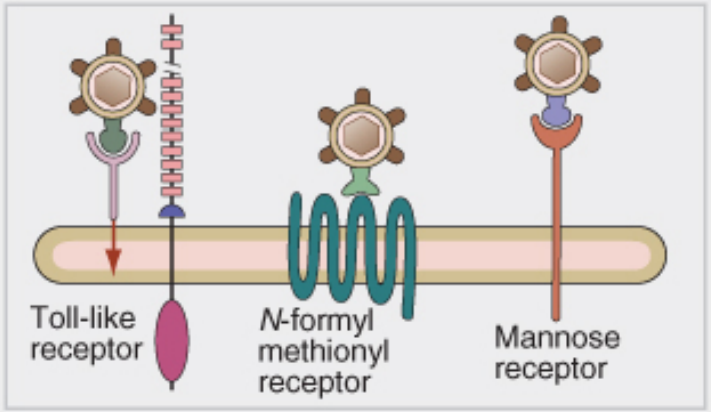
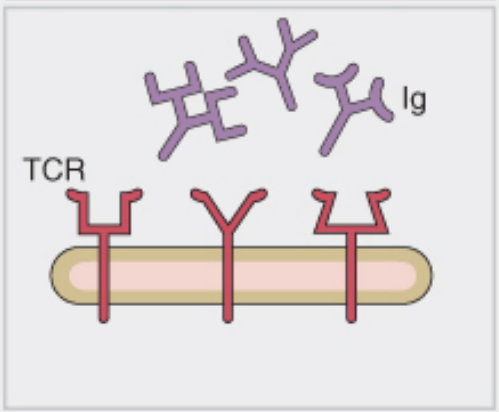
MACRÓFAGOS



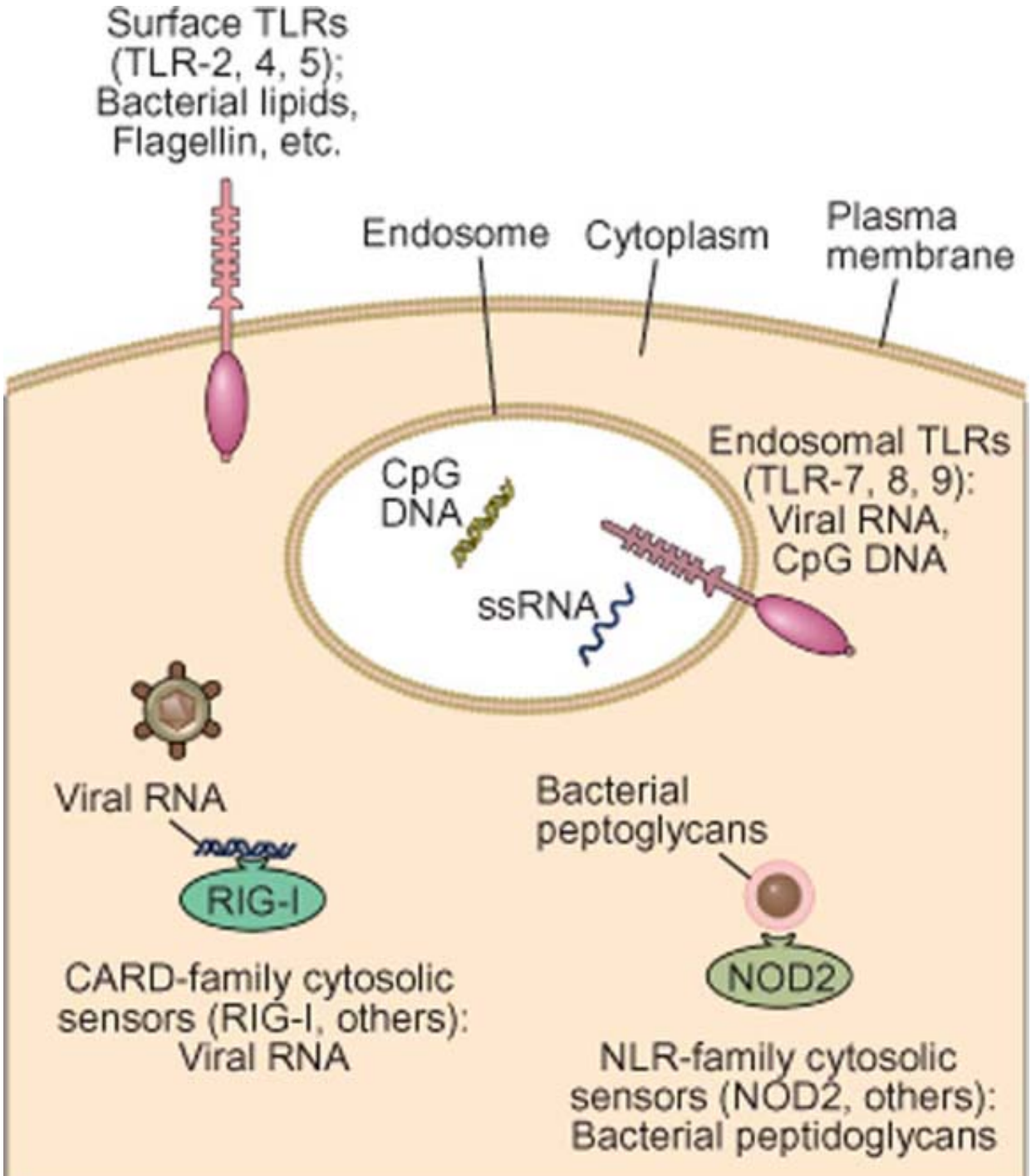
MACRÓFAGOS



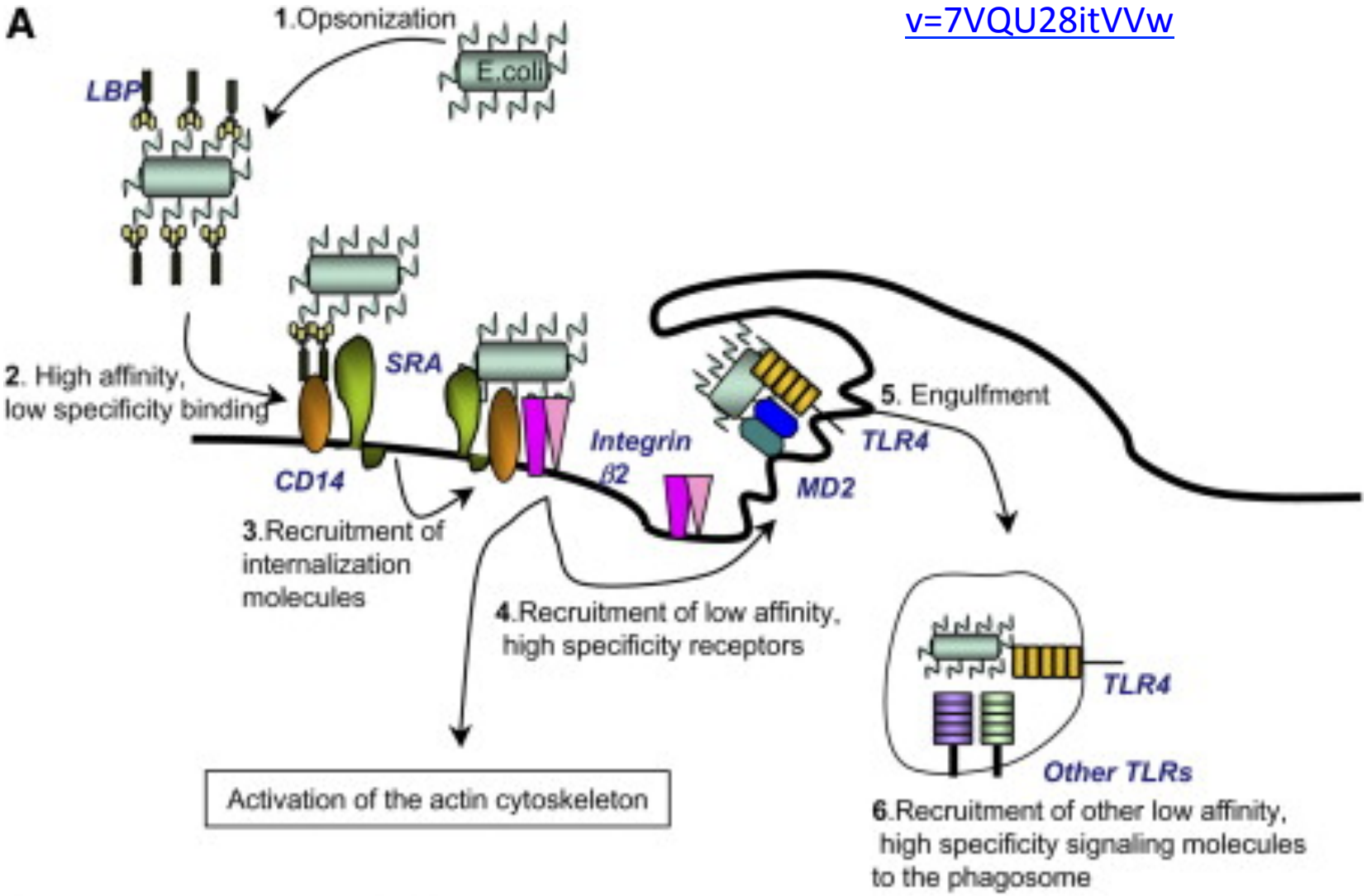
Nature Reviews | Immunology

	Imunidade inata	Imunidade adaptativa
especificidade	Padrões moleculares de patógenos 	Detalhes estruturais (antígenos), podem ser não microbianos 
receptores	Codificados na linhagem germinativa Diversidade limitada 	Recombinação somática grande diversidade 
Distribuição receptores	Não clonal, receptores iguais em todas as células de uma linhagem	Clonal, cada clone de linfócito tem especificidade diferente
Discriminação próprio	Sim, células próprias não são reconhecidas ou apresentam mecanismos de prevenção	Sim, por seleção contra antígenos próprios (pode ser imperfeita)

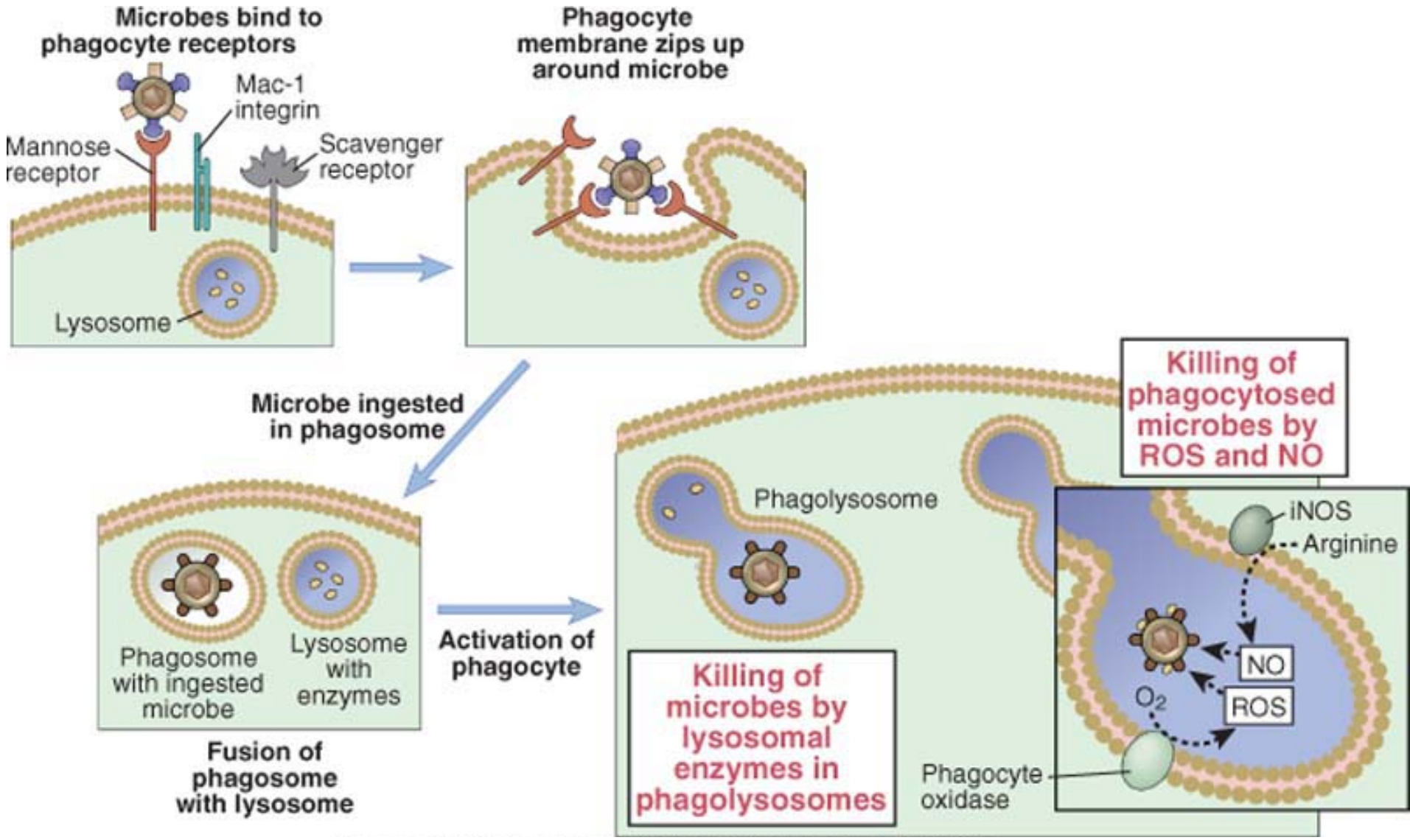
RECEPTORES DA RESPOSTA INATA



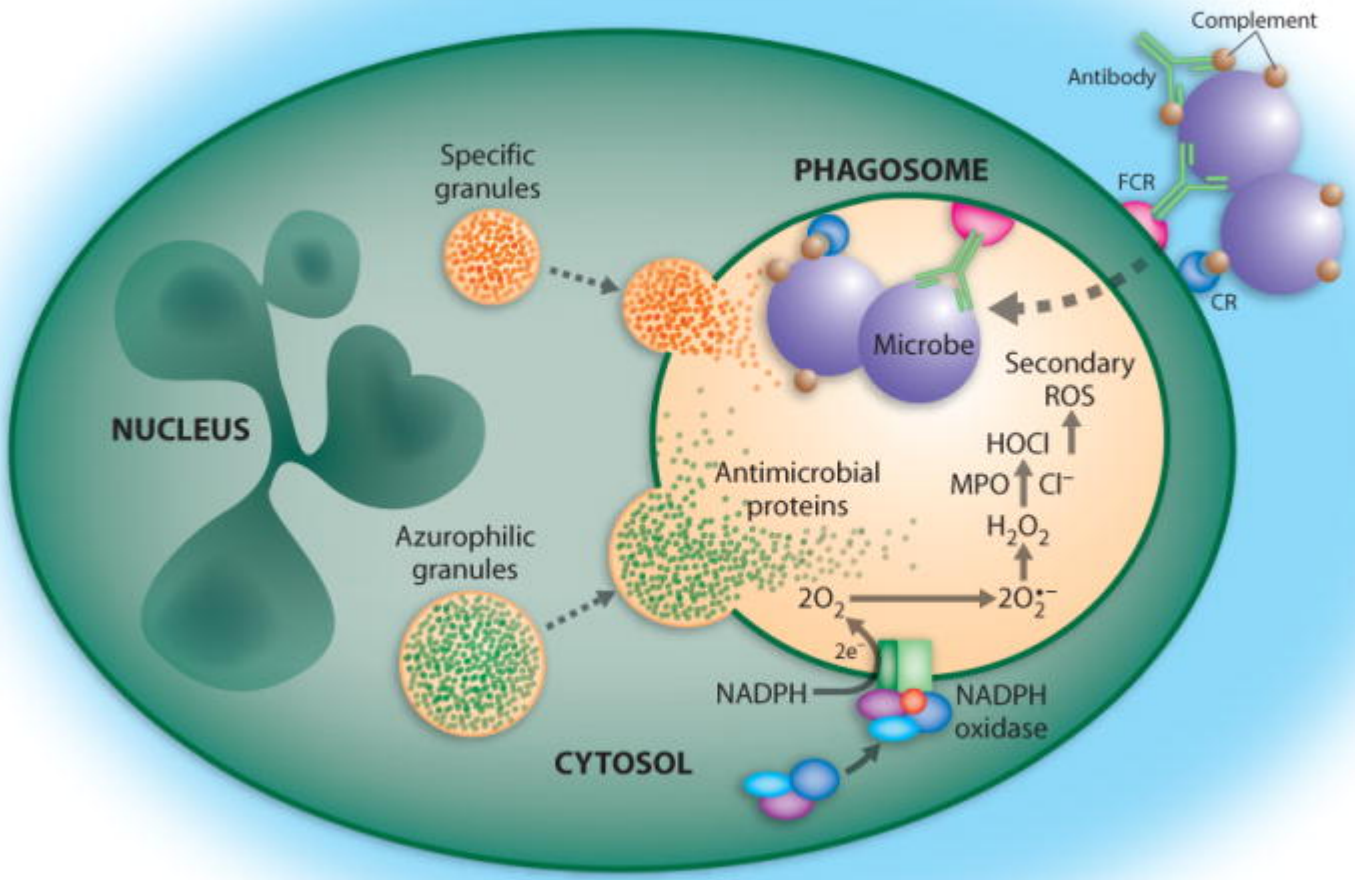
http://www.youtube.com/watch?v=MdR9ctxzab4
http://www.youtube.com/watch?v=7VQU28itVVw



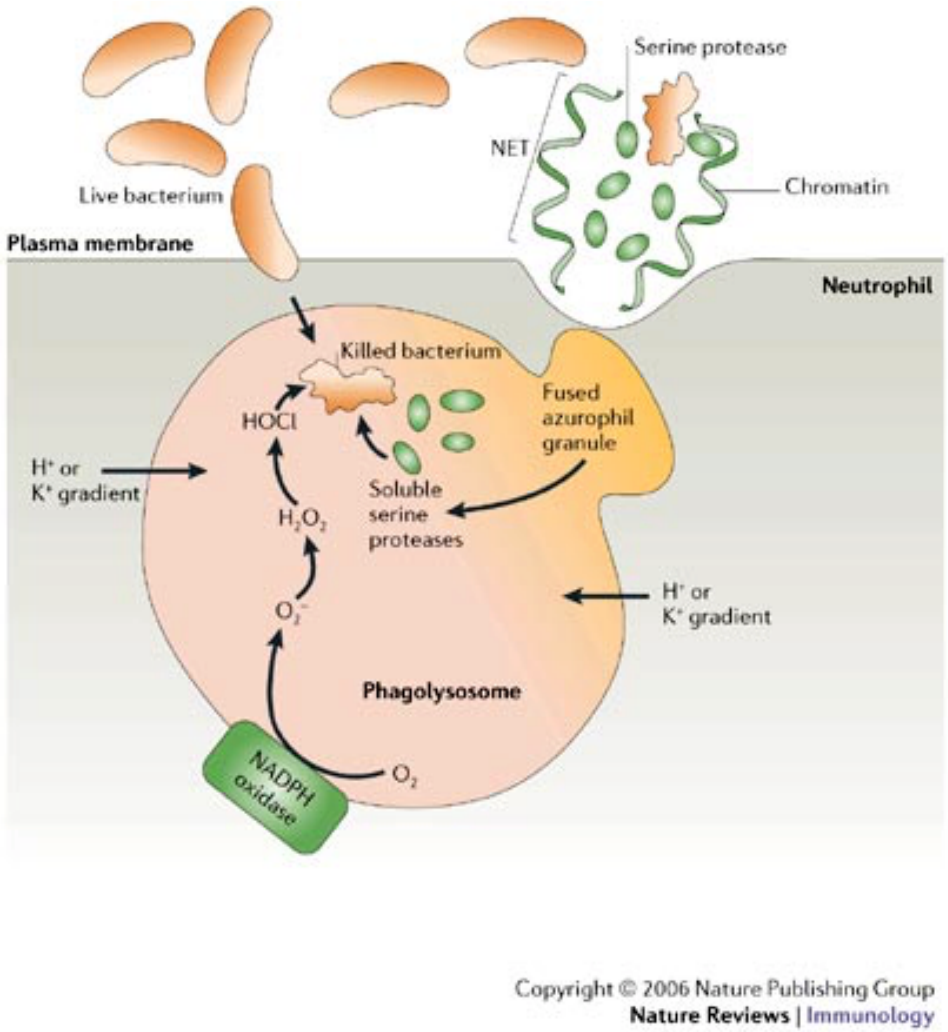
FAGOCITOSE E PRODUÇÃO DE ESPÉCIES REATIVAS DE OXIGÊNIO E NITROGÊNIO

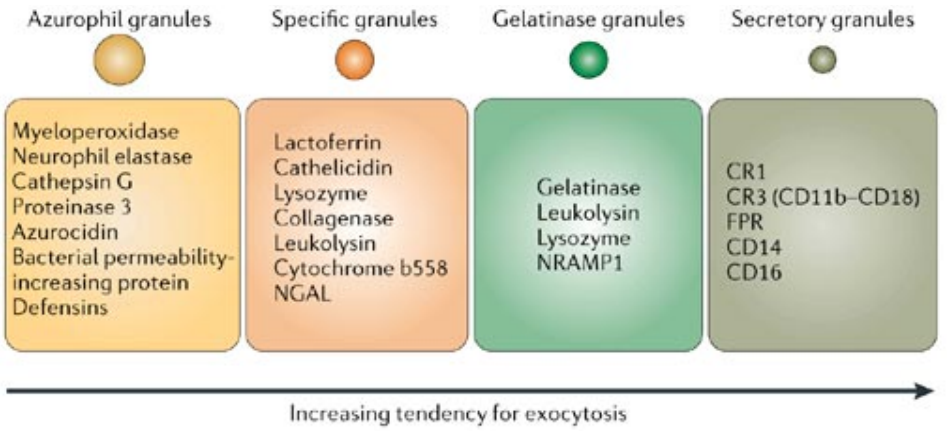


NEUTRÓFILOS SÃO FAGÓCITOS

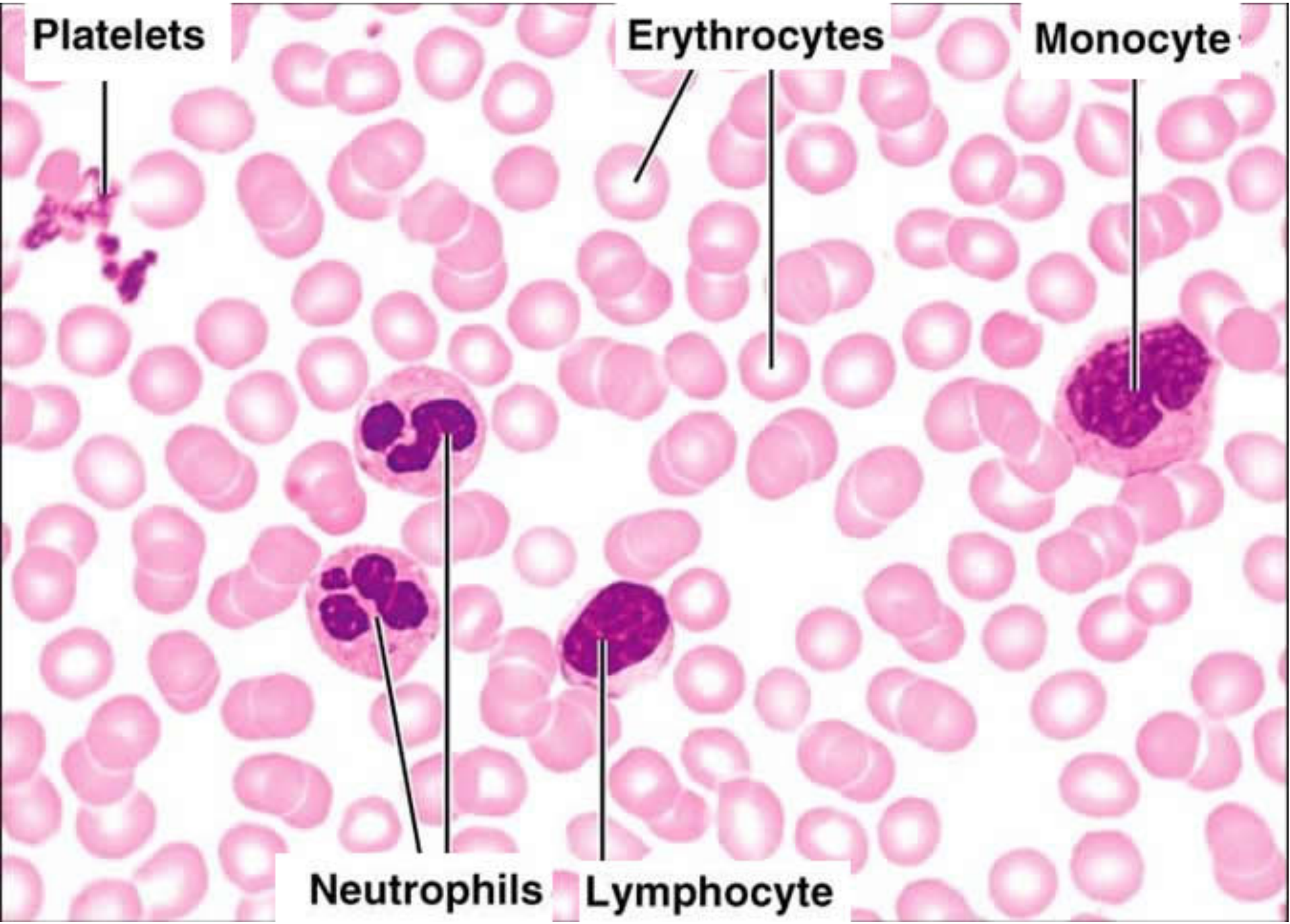


NEUTRÓFILOS SÃO GRANULÓCITOS





https://www.youtube.com/watch?v=K7yku3sa4Y8&list=PLADA5F82C753B24D1&index=6


Platelets
Erythrocytes
Monocyte
Neutrophils
Lymphocyte

INFLAMAÇÃO

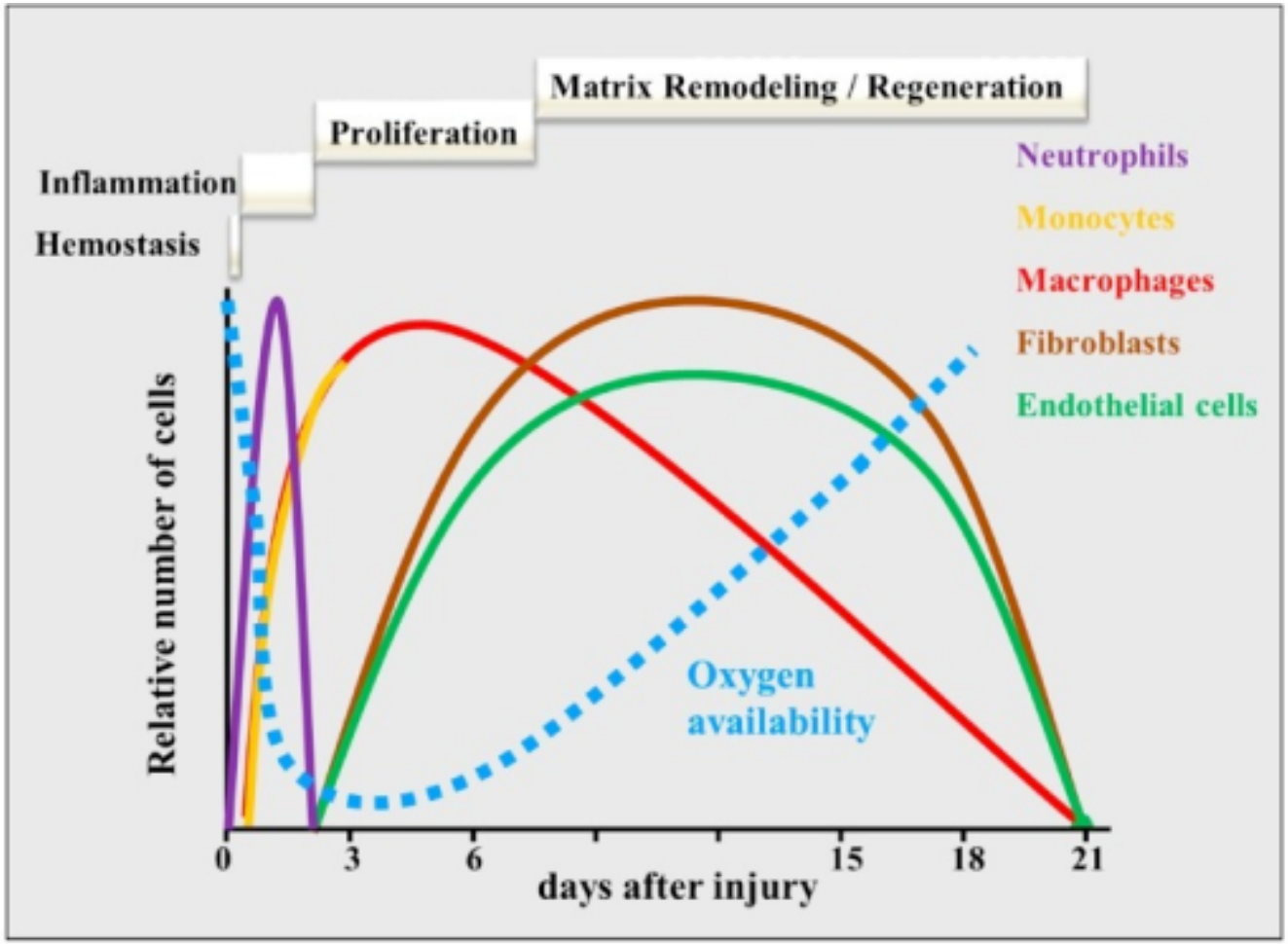
- resposta de tecidos vasculares a estímulo danoso como infecção, células mortas, fatores irritantes.
- mecanismo de proteção onde o organismo tenta remover o estímulo danoso e iniciar processo de cicatrização
- Rubor, tumor, dor, calor
- perda de função
- latim – inflammare = pegar fogo

https://www.youtube.com/watch?v=suCKm97yvyk

FUNÇÕES DA INFLAMAÇÃO

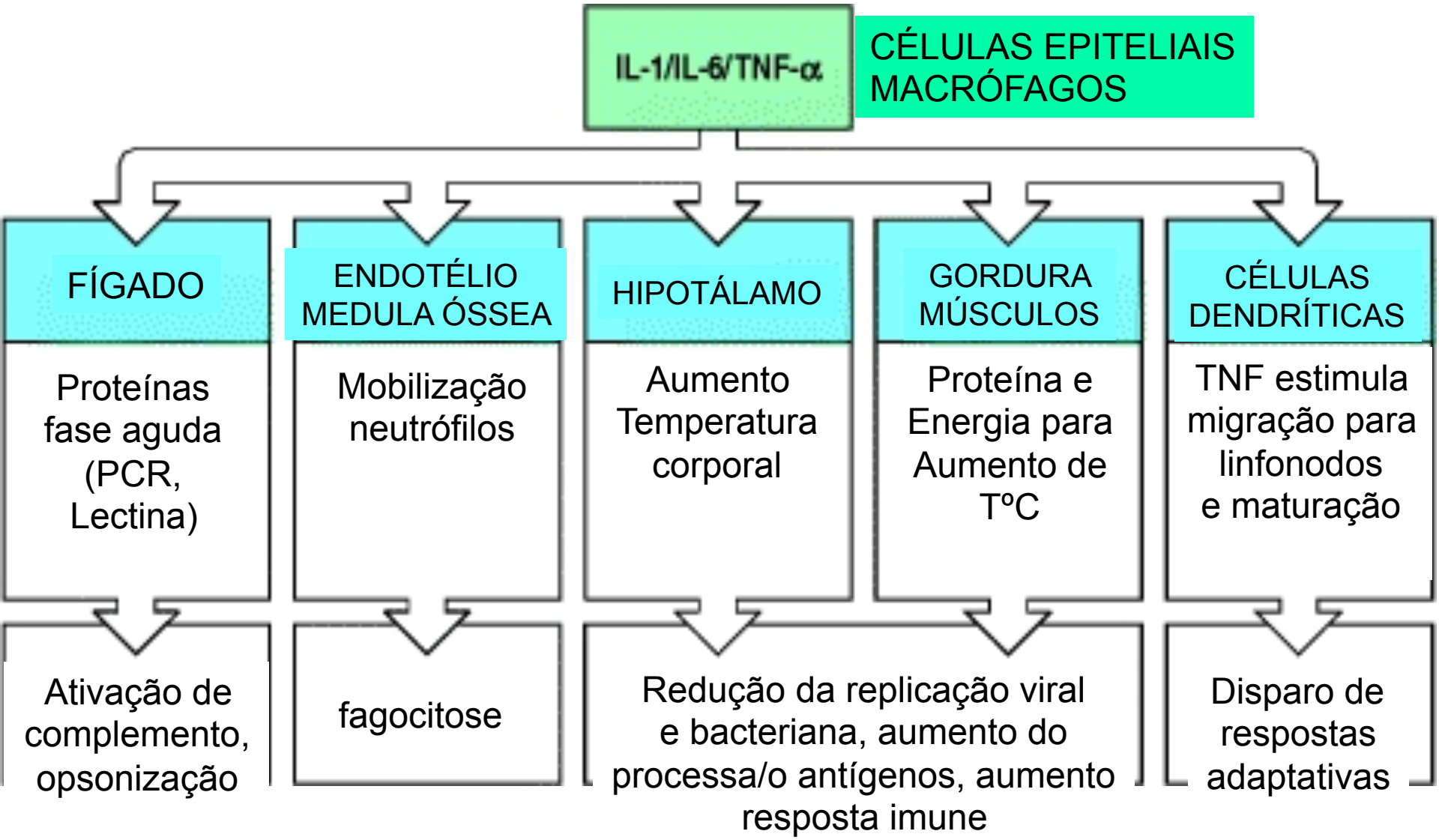
- Eliminação de patógenos
- Disparo de respostas adaptativas
- Reparo tecidual

FASES DA INFLAMAÇÃO



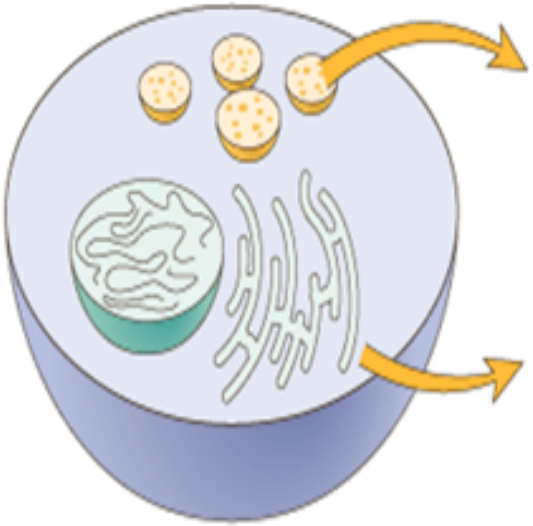
MEDIADORES DA INFLAMAÇÃO
(e também das respostas inatas!)

CITOCINAS

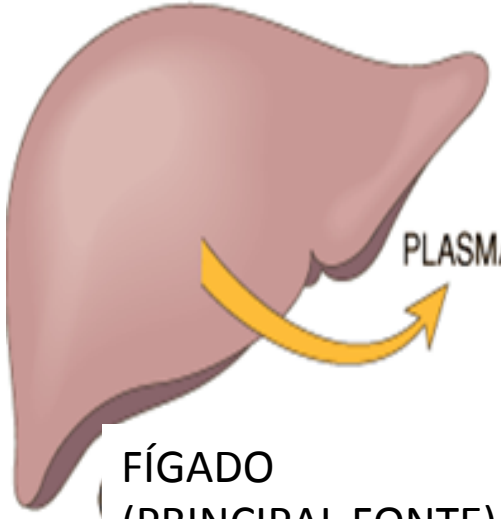

IL-1/IL-6/TNF-α
CÉLULAS EPITELIAIS
MACRÓFAGOS
FÍGADO
Proteínas fase aguda (PCR, Lectina)
Ativação de complemento, opsonização
ENDOTÉLIO
MEDULA ÓSSEA
Mobilização neutrófilos
fagocitose
HIPOTÁLAMO
Aumento Temperatura corporal
GORDURA
MÚSCULOS
Proteína e Energia para Aumento de TºC
CÉLULAS
DENDRÍTICAS
TNF estimula migração para linfonodos e maturação
Redução da replicação viral e bacteriana, aumento do processa/o antígenos, aumento resposta imune
Disparo de respostas adaptativas

MEDIADORES DA INFLAMAÇÃO

CELULARES



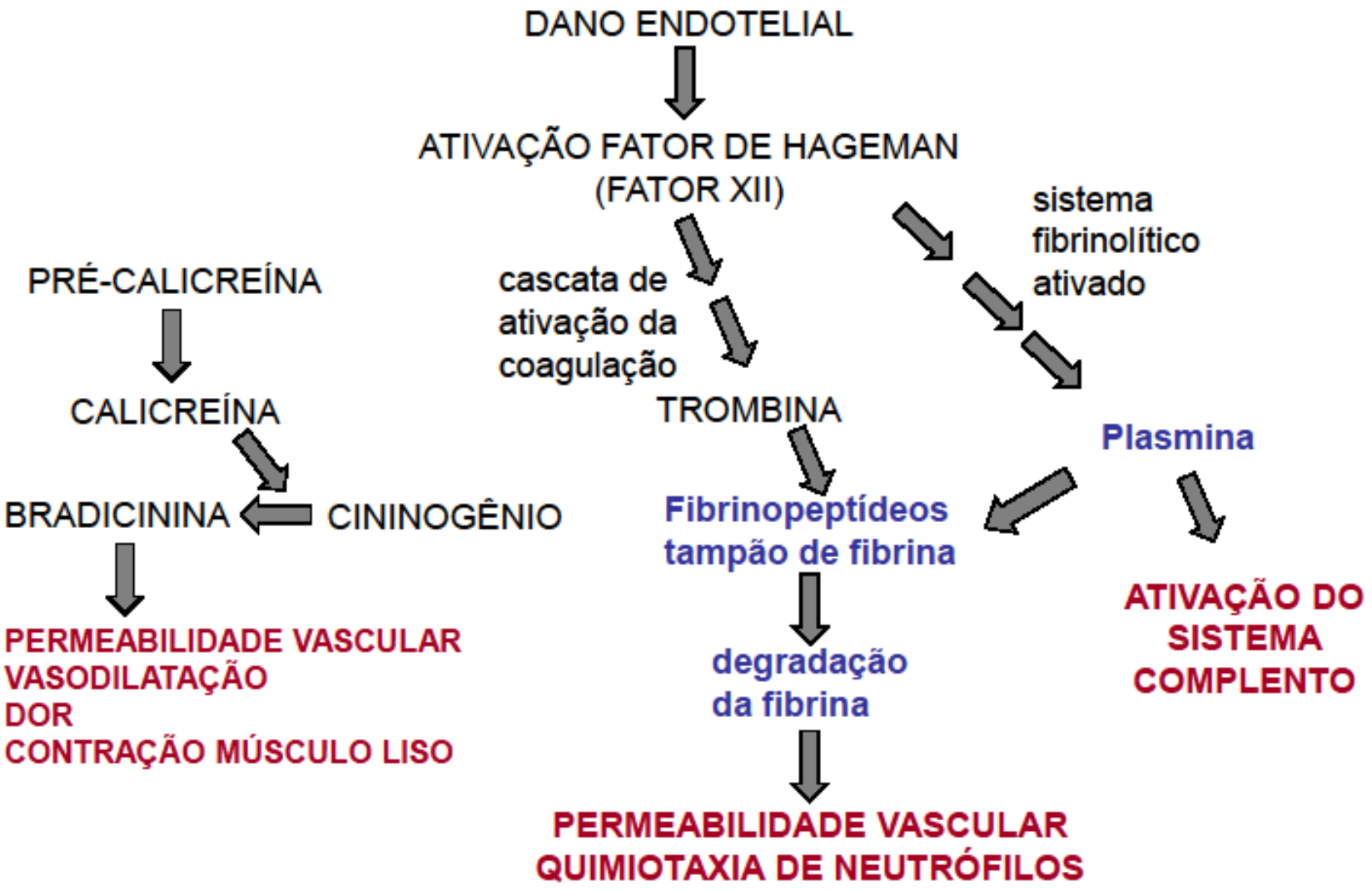
MEDIADORES	FONTE
PRÉ-FORMADOS EM GRÂNULOS SECRETÓRIOS	
Histamine	Mast cells, basophils, platelets
Serotonin	Platelets
Lysosomal enzymes	Neutrophils, macrophages
SINTETIZADOS *DE NOVO*	
Prostaglandins	All leukocytes, platelets, EC
Leukotrienes	All leukocytes
Platelet-activating factors	All leukocytes, EC
Activated oxygen species	All leukocytes
Nitric oxide	Macrophages
Cytokines	Lymphocytes, macrophages, EC

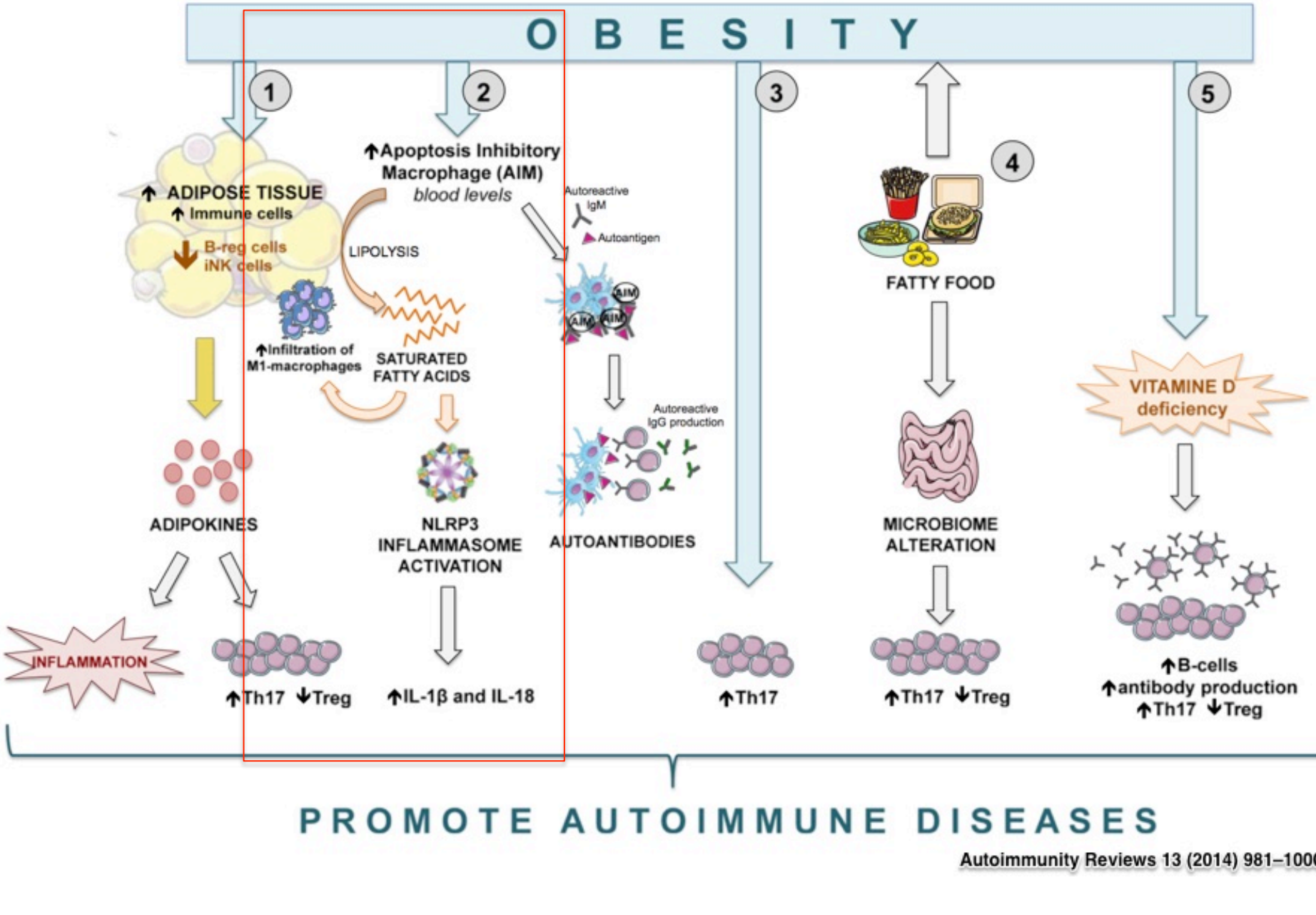


FÍGADO
(PRINCIPAL FONTE)

Factor XII (Hageman factor) activation	Kinin system (bradykinin)
	Coagulation / fibrinolysis system
Complement activation	C_{3a}, C_{5a} — anaphylatoxins
	C_{3b}
	C_{5b-9} (membrane attack complex)

MEDIADORES PLASMÁTICOS





Autoimmunity Reviews 13 (2014) 981–1000

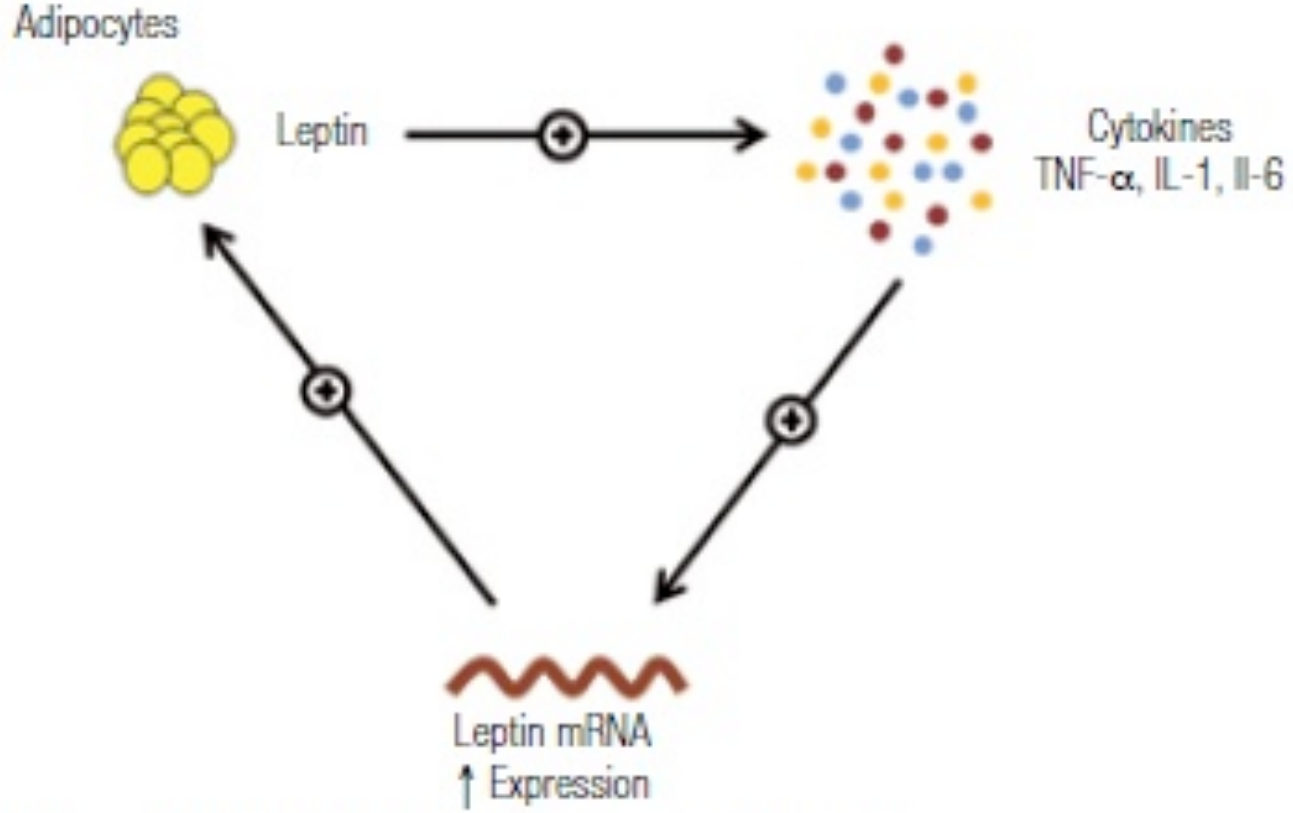


Figure 4. Interaction between leptin and cytokines.

Leptin upregulates the production of pro-inflammatory cytokines, such as tumor necrosis factor alpha (TNF-α), interleukin 1 (IL-1), and interleukin (IL-6). These cytokines increase the expression of leptin mRNA, which subsequently sustains production of leptin. This is thought to be the mechanism for chronic inflammation.

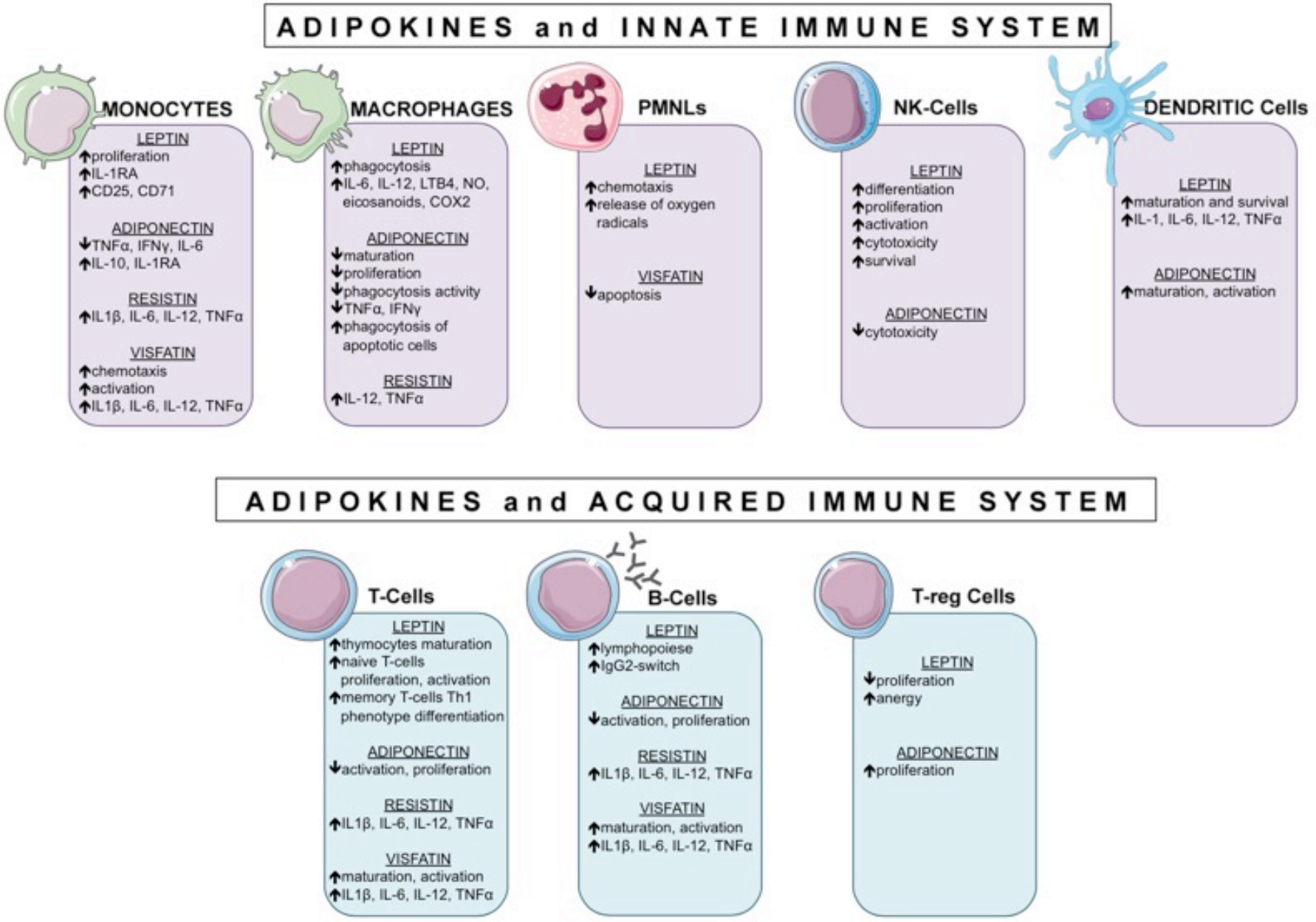


Fig. 2. Main effects of leptin, adiponectin, resistin and visfatin on cells of the innate and acquired immunity. Abbreviations: COX2: CycloOXygenase-2; IL: Interleukin; IL-1 RA: Interleukin-1 Receptor Antagonist; LTB4: Leukotrien-B4; NK-cells: Natural Killer cells; PMNLs: PolyMorphoNuclear Leukocytes; Treg-cells: regulatory T cells.

M. Versini et al. / Autoimmunity Reviews 13 (2014) 981–1000

FOODS THAT FIGHT INFLAMMATION

Chronic inflammation has been linked to cancer, heart disease, diabetes, arthritis, depression, and Alzheimer's. Fight inflammation with a healthy diet.

ANTI-INFLAMMATION FOODS

Tomatoes

Fruits

Strawberries, blueberries, oranges and cherries.

Nuts

Almonds, walnuts, and other nuts.

Olive oil

Leafy greens

Spinach, kale, collards, and more.

Fatty fish

Salmon, mackerel, tuna, and sardines.

INFLAMMATION FOODS

Fried foods

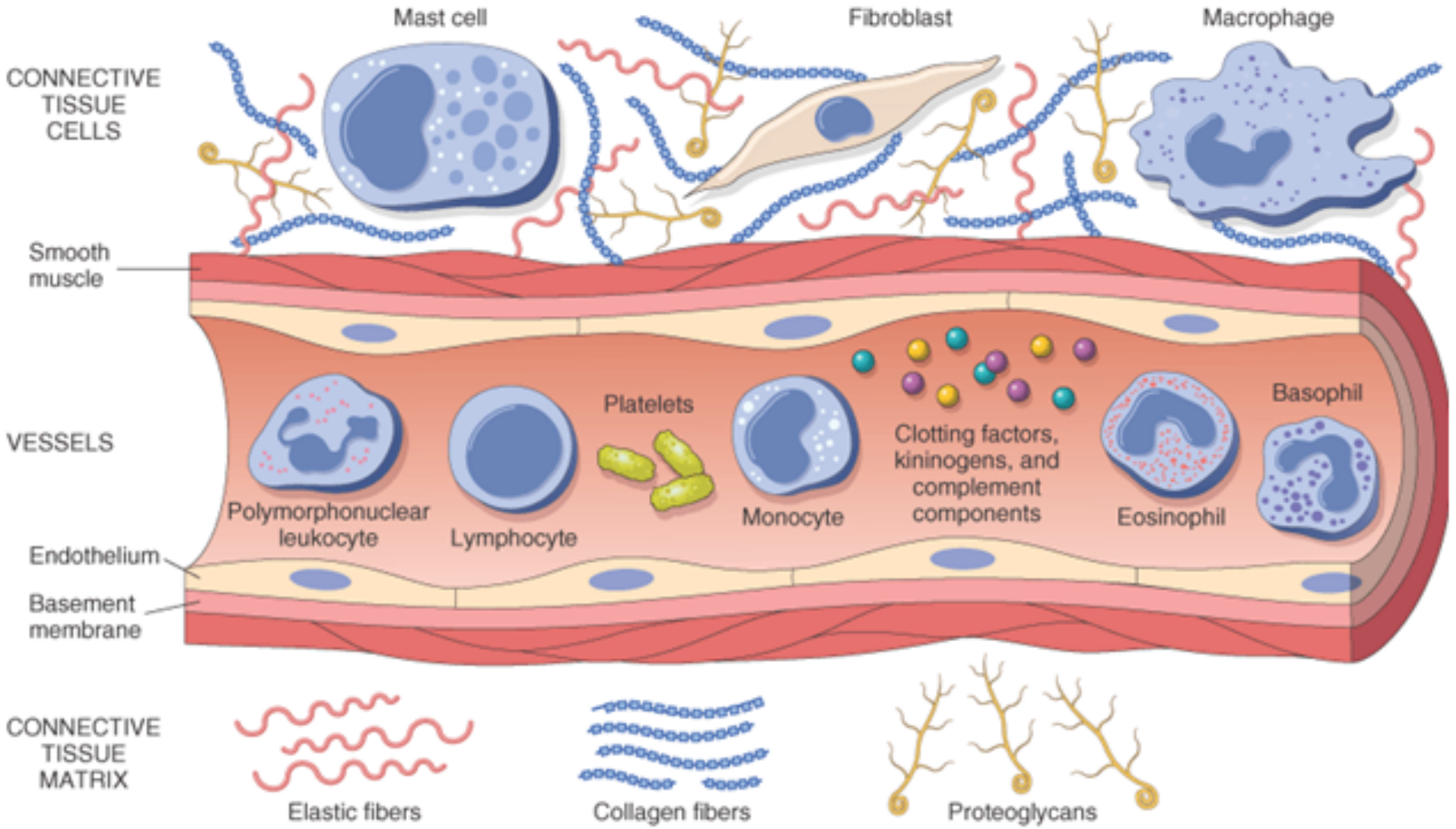
Sodas

Refined carbs

Lard

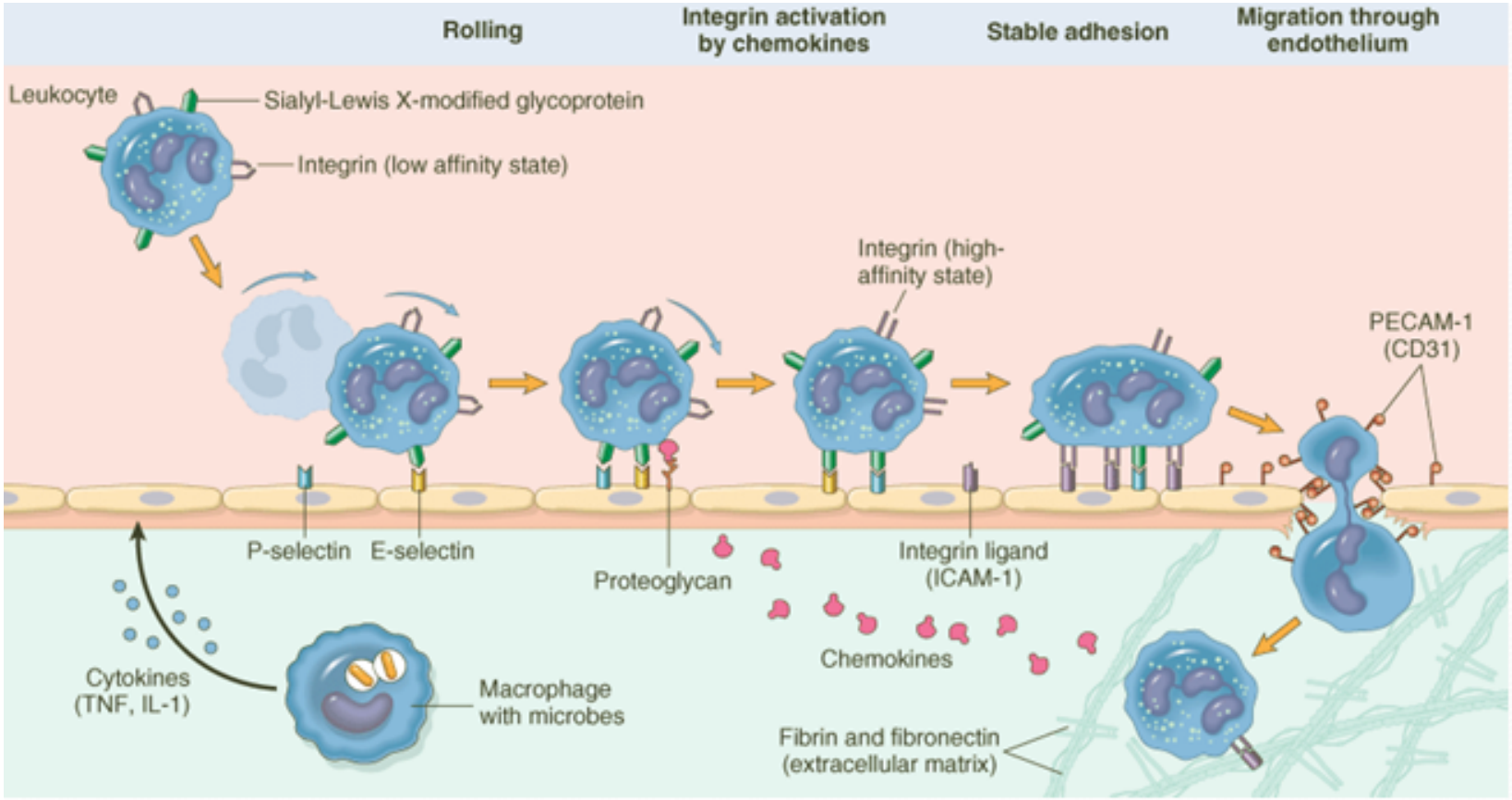
Processed meats

RECRUTAMENTO DE CÉLULAS FAZ PARTE DA INFLAMAÇÃO



MIGRAÇÃO E EXTRAVAZAMENTO

CÉLULAS TAMBÉM CIRCULAM!



https://www.youtube.com/watch?v=1SvEdg94qUA

https://www.youtube.com/watch?v=vZ9ykvRhWK0

http://www.youtube.com/watch?v=OFqDyPuYFCo