

INFLAMMATION CHRONIQUE DANS LES MALADIES CARDIOVASCULAIRES LIÉES À L'ATHÉROME : PLACE DE LA NUTRITION

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Chirurgien des Hôpitaux

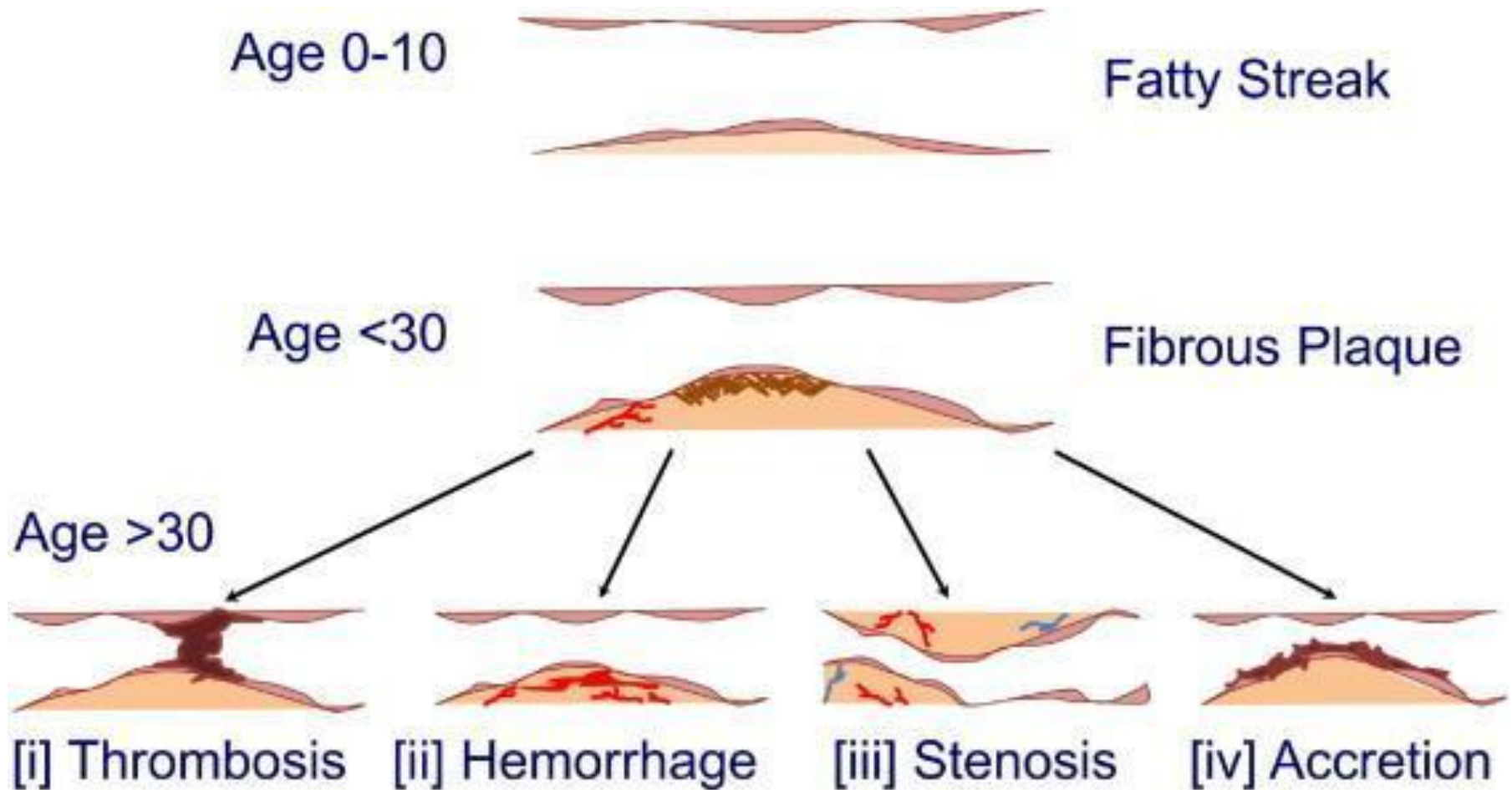


Figure 1 Evolution of human atherosclerosis. Fatty streaks represent one of the earliest visible lesions in atherogenesis, and have been observed early in life. These fatty streaks often evolve into fibrous plaques, coupled with intimal hyperplas...
 Brian W. Wong, Anna Meredith, David Lin, Bruce M. McManus

The Biological Role of Inflammation in Atherosclerosis

Canadian Journal of Cardiology Volume 28, Issue 6 2012 631 - 641

<http://dx.doi.org/10.1016/j.cjca.2012.06.023>

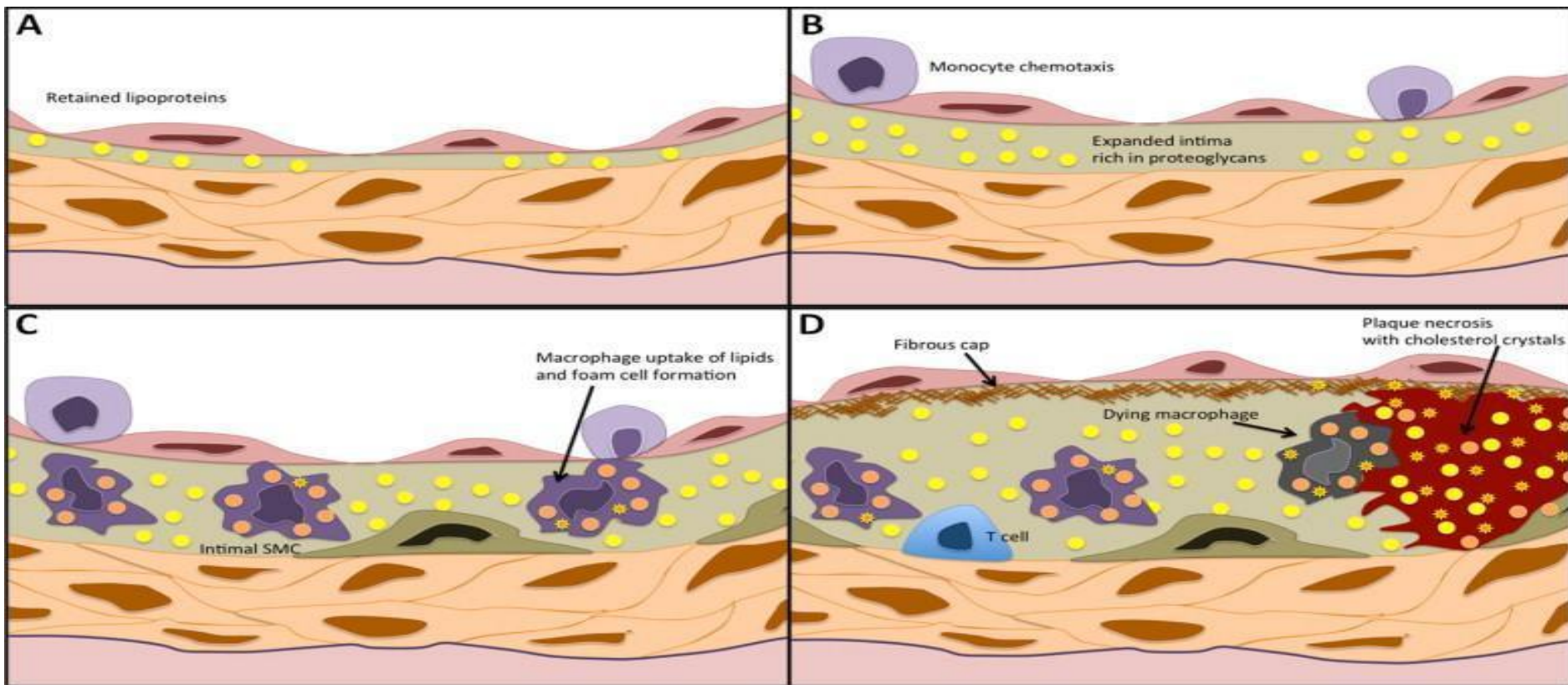


Figure 3 Progression of atherosclerosis and plaque formation. (A) The subendothelial retention of lipoproteins is an early initiating factor in atherogenesis. (B) This initiating process results in monocyte chemotaxis in response to trapped I...

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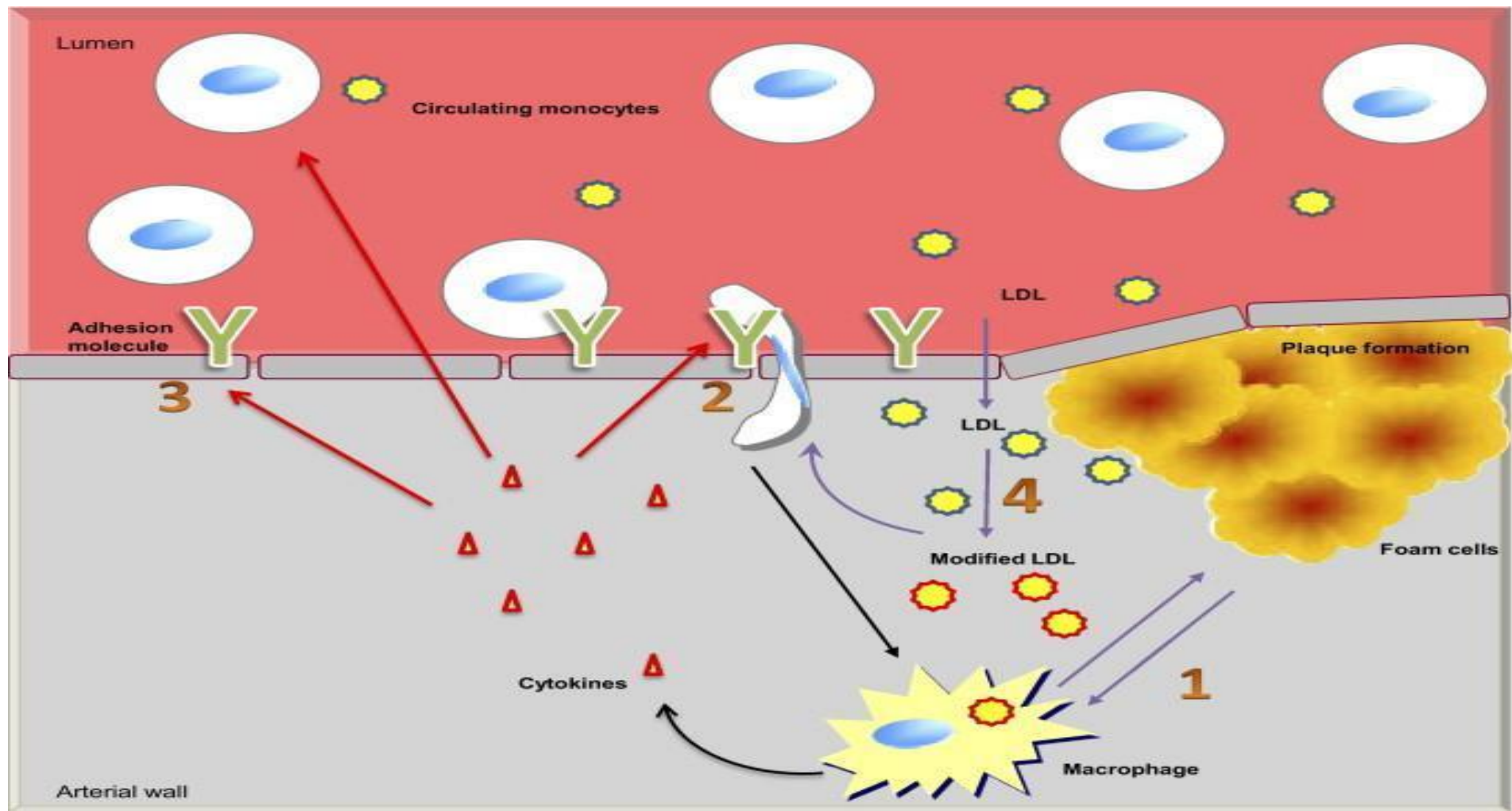


Figure 1 Inhibition of atherosclerosis by high-density lipoprotein (HDL). The diagram highlights the targets of the antiatherosclerotic actions of HDL. HDL inhibits atherosclerosis by promoting cholesterol efflux from foam cells (1), by regulatin...
 Val?rie Duchatelle , Ekaterini A. Kritikou , Jean-Claude Tardif

Clinical Value of Drugs Targeting Inflammation for the Management of Coronary Artery Disease

Canadian Journal of Cardiology Volume 28, Issue 6 2012 678 - 686

<http://dx.doi.org/10.1016/j.cjca.2012.05.003>

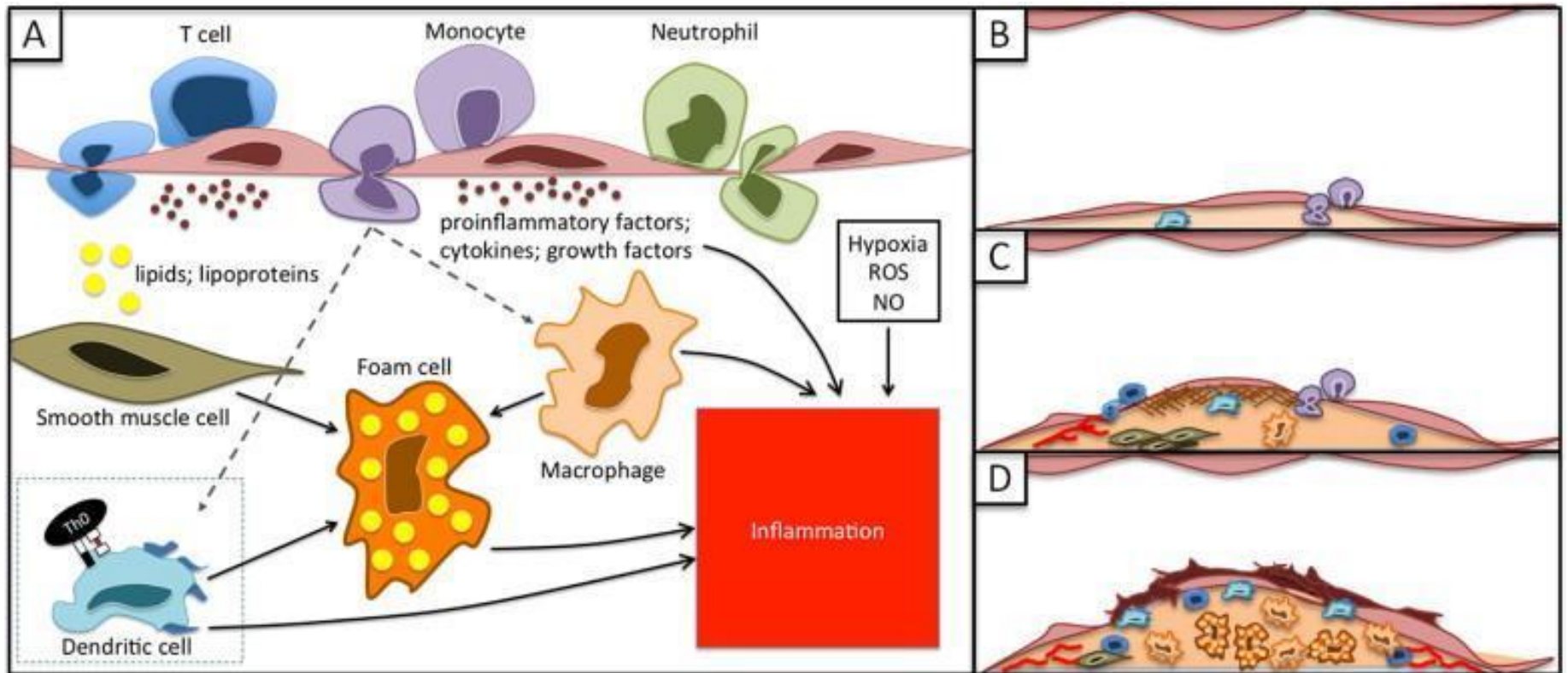


Figure 2 Inflammatory mediators in atherosclerosis. (A) Numerous inflammatory cell types play major roles in mediating the inflammatory response which is part of atherosclerosis, including T-cells, monocytes, and neutrophils. Early insudation a...
 Brian W. Wong , Anna Meredith , David Lin , Bruce M. McManus

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ATHÉROME CAROTIDIEN ÉVOLUÉ



INFLAMMATION CHRONIQUE ET ATHÉROME

Marqueurs de l'inflammation chronique :

- VS
- CRP
- Fibrinogène

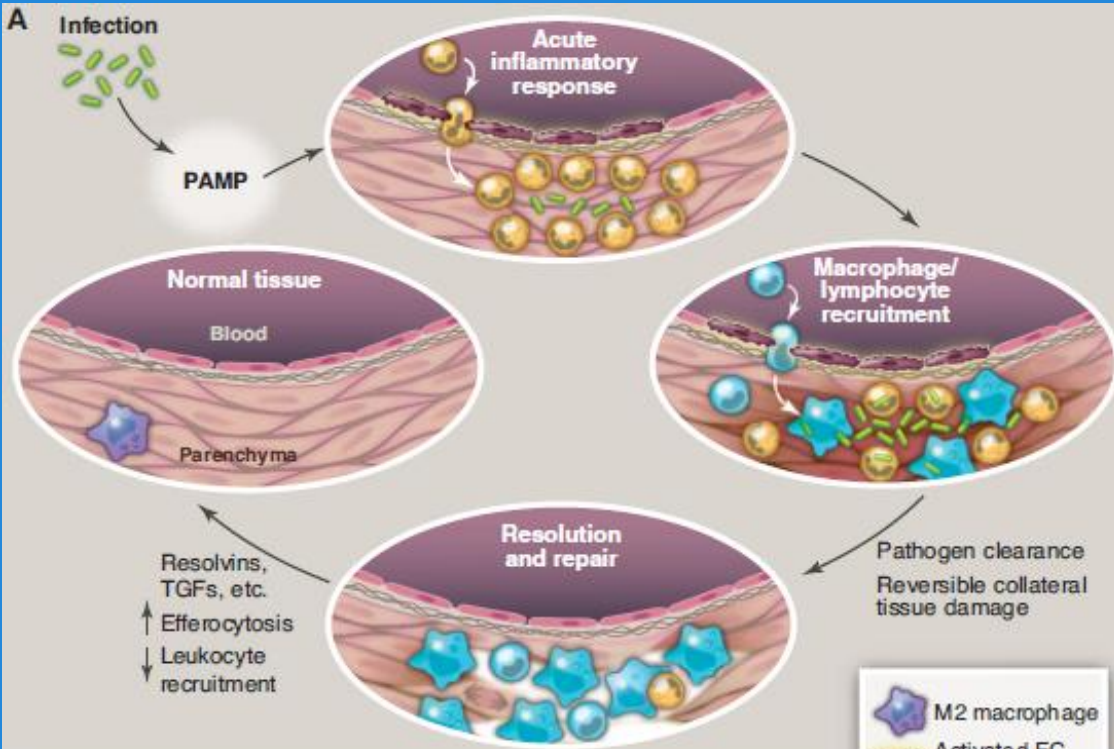
Modèles cliniques d'inflammation chronique
avec accélération de l'athérogénèse








- Diabète type 2
- Fumeur actif
- Polyarthrite rhumatoïde

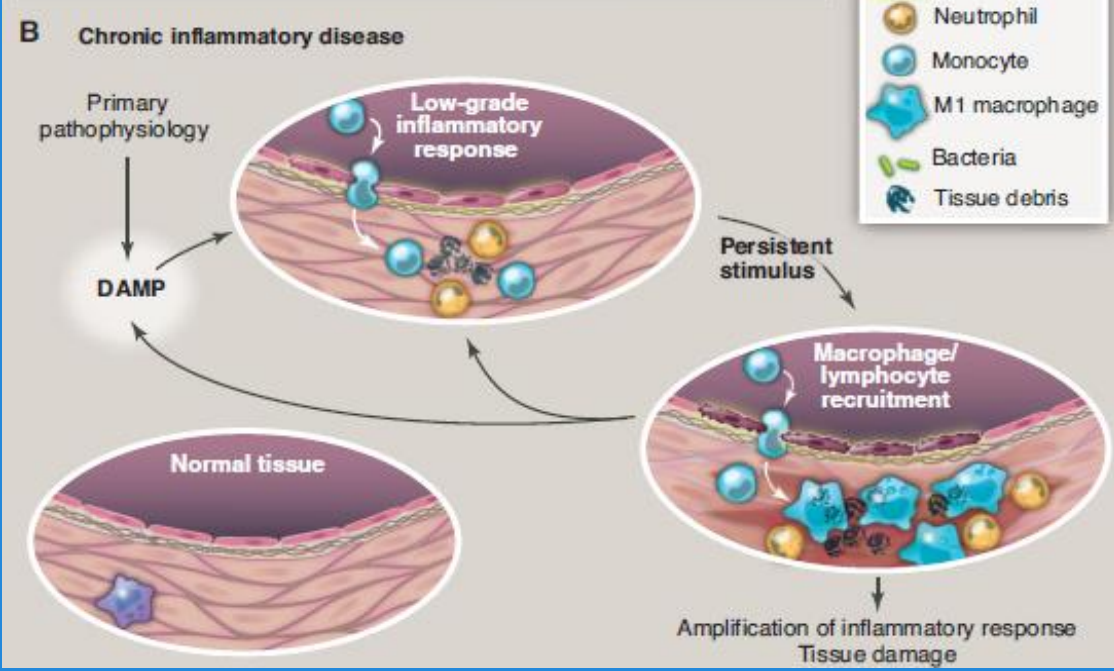
PREUVES DIAGNOSTIQUES DE L'INFLAMMATION DANS LA PLAQUE D'ATHÉROME

Table 1. Molecular imaging targets for the vulnerable plaque

Process	Target	Agent	Imaging modality	Phase (reference)
Inflammation	Macrophages	¹⁸ F-DG	PET or PET/CT	Clinical [39–43, 65–69]
		¹¹ C-PK11195	PET	Clinical [71–73]
		^{99m} Tc-labeled anti-LOX-1	SPECT	Preclinical [46, 47]
		Nanoparticles	MRI	Preclinical [51, 53]
Apoptosis	P-selectin (EC and platelets)	^{99m} Tc-fucoïdan	SPECT/ MRI	Preclinical [59–61]
	VSMC, macrophages	^{99m} Tc-anxA5	SPECT	Clinical [42, 83–85, 91]
Vascular remodeling	VSMC	Z2D3	SPECT	Preclinical [96–101]
	MMP	P947	MRI	Preclinical [23, 25, 54, 102]
	integrin $\alpha_v\beta_3$	Nanoparticles	MRI	Preclinical [26]
	ED-B	L19	SPECT	Preclinical [107]



-  M2 macrophage
-  Activated EC
-  Neutrophil
-  Monocyte
-  M1 macrophage
-  Bacteria
-  Tissue debris



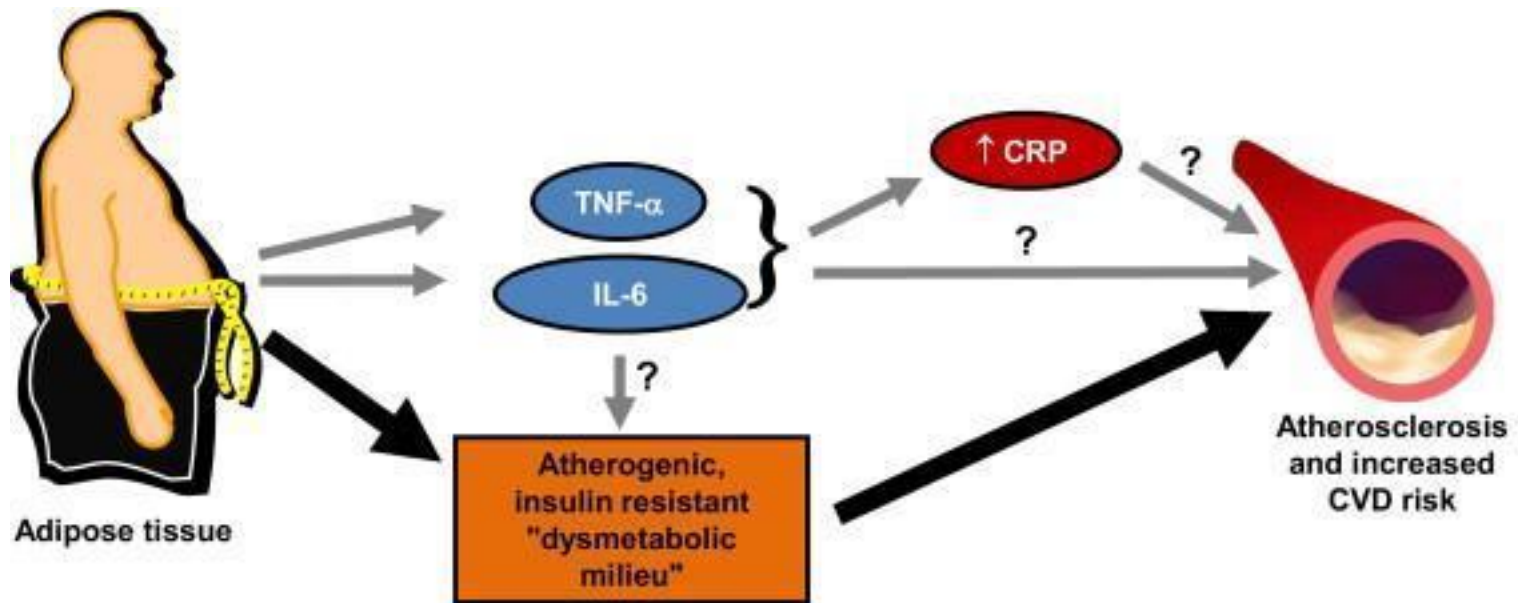


Figure 4 Working model by which an elevated C-reactive protein (CRP) concentration predicts the risk of an acute coronary syndrome. First, CRP per se may have a direct impact on processes involved in the etiology of coronary heart disease. Second...

Jean-Pierre Després

Abdominal Obesity and Cardiovascular Disease : Is Inflammation the Missing Link?

Canadian Journal of Cardiology Volume 28, Issue 6 2012 642 - 652

<http://dx.doi.org/10.1016/j.cjca.2012.06.004>

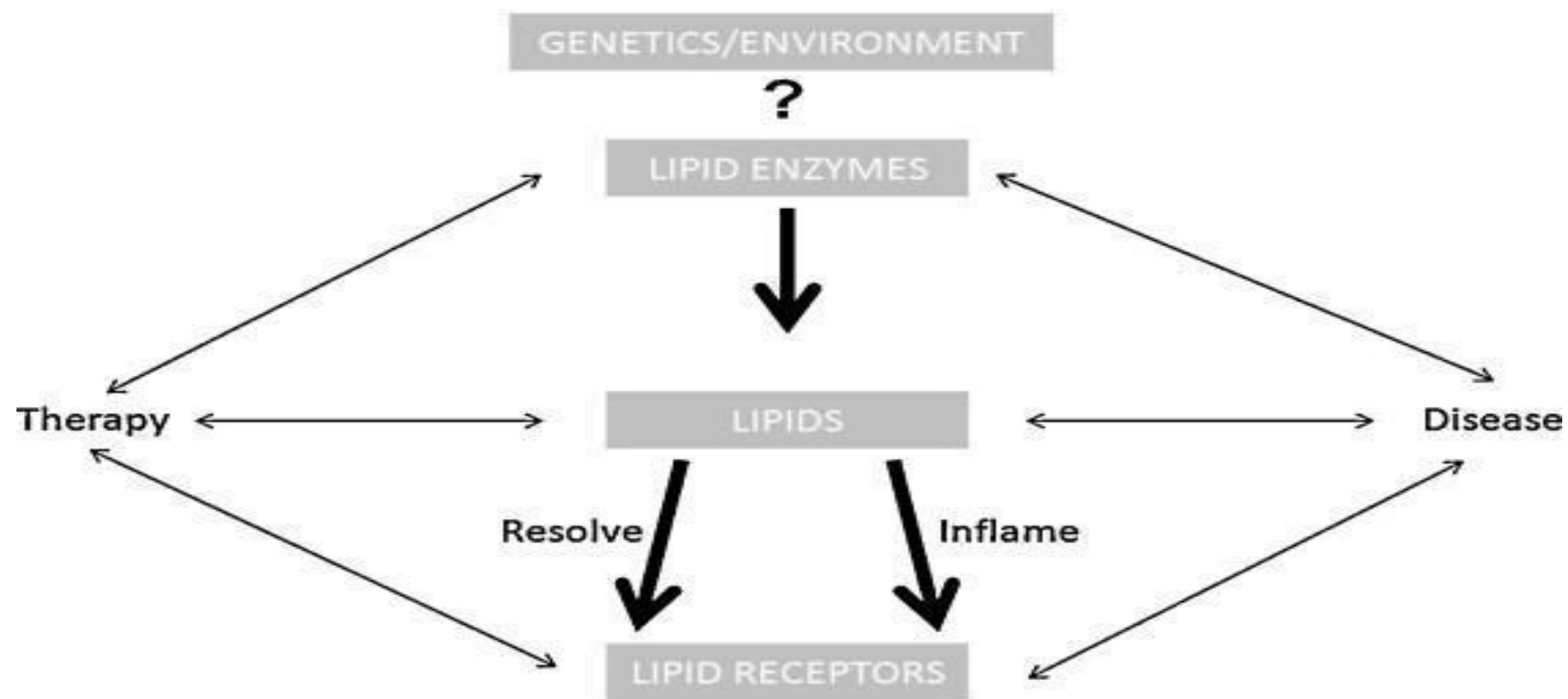


Fig. 1 The continuum of bioactive lipid pathways. Whether prostaglandins or resolvins bind lipid receptors in a therapeutic context, or HETE molecules interact with receptors to push cancer toward metastasis, there is evidence to support nearly ...

Stephanie C. Tucker, Kenneth V. Honn

Emerging targets in lipid-based therapy

Biochemical Pharmacology Volume 85, Issue 5 2013 673 - 688

<http://dx.doi.org/10.1016/j.bcp.2012.11.028>

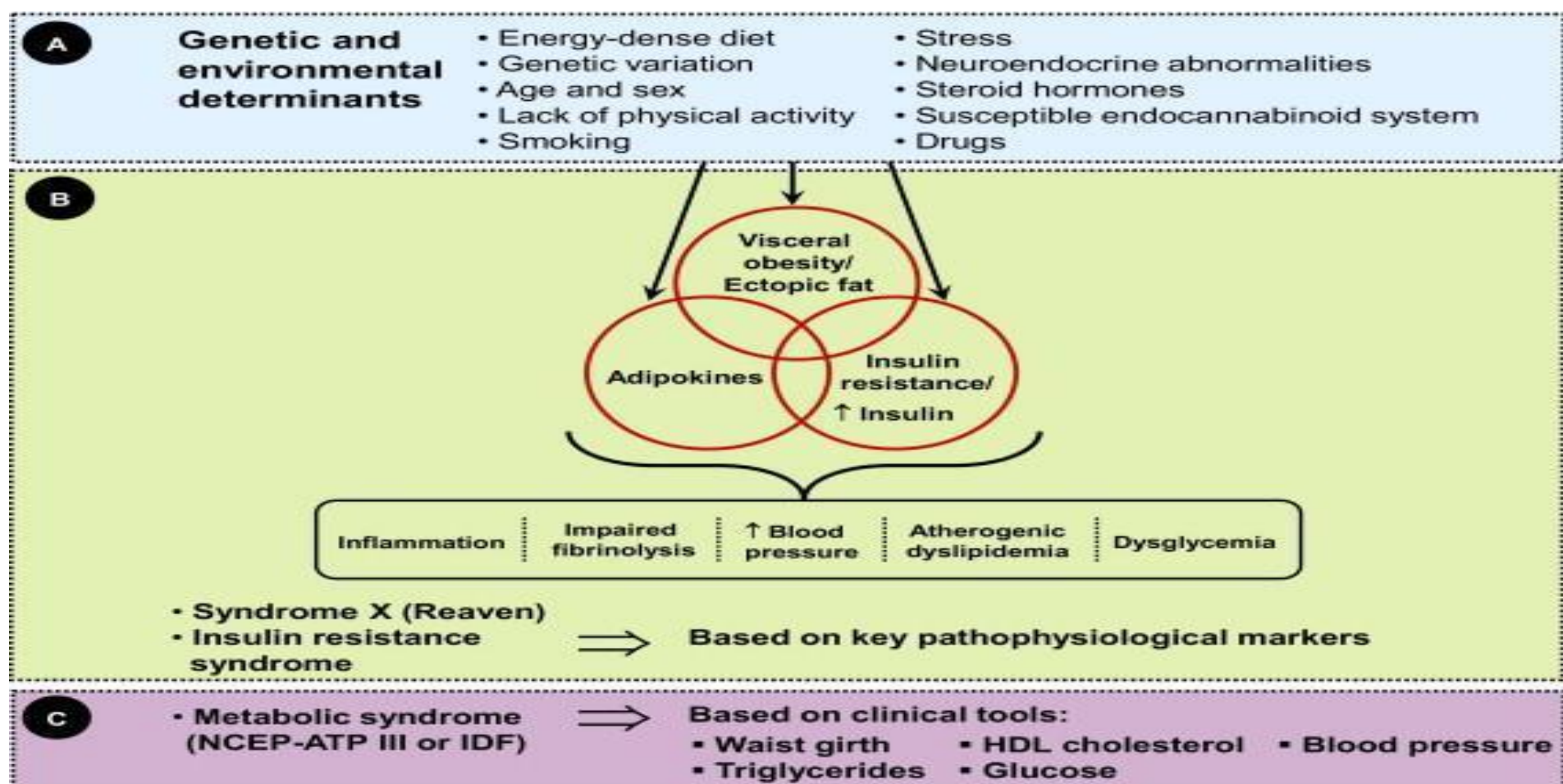


Figure 1 Simplified model showing the possible correlates (A) of insulin resistance often found among individuals with excess visceral/ectopic fat. (B) Illustrates the notion that the syndrome X/insulin resistance syndrome concept was based o...
Jean-Pierre Després

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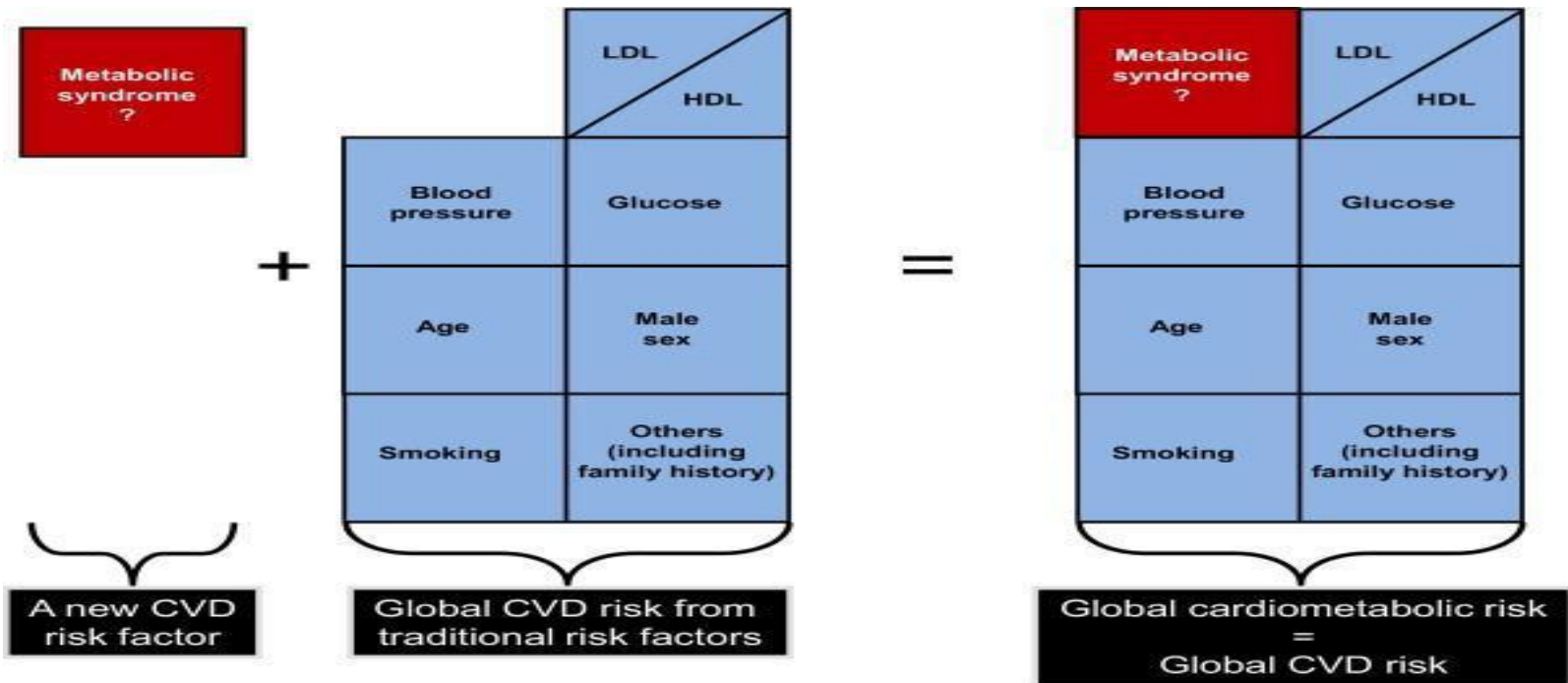


Figure 2 : The « building blocks » of global cardiometabolic risk. Cardiometabolic risk is the overall risk of cardiovascular disease (CVD) resulting from the presence of the metabolic syndrome but also of traditional risk factors such as lipids (low...

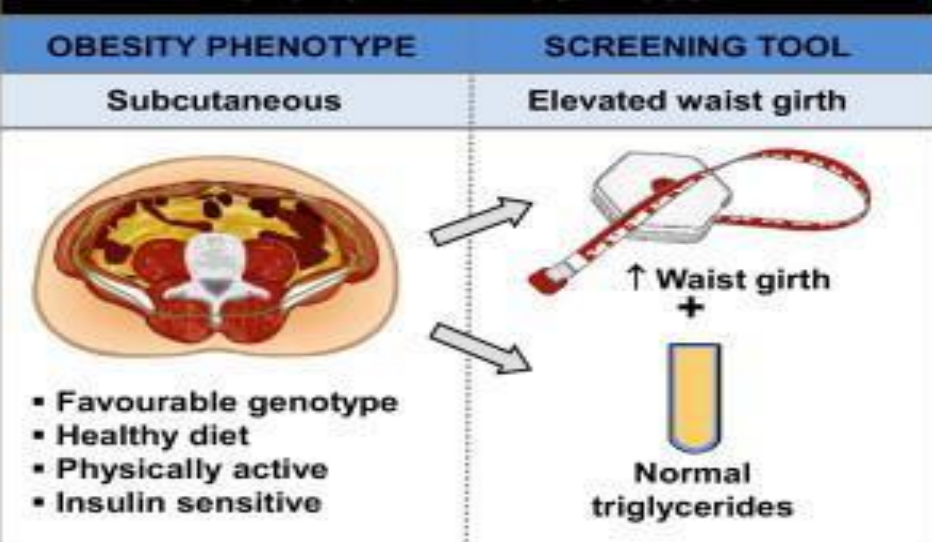
Jean-Pierre Després

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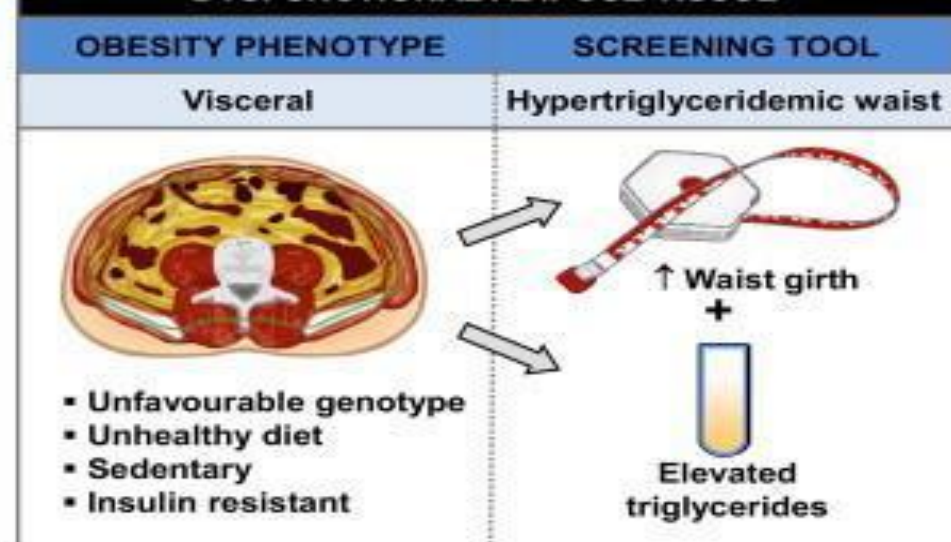
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FUNCTIONAL ADIPOSE TISSUE



DYSFUNCTIONAL ADIPOSE TISSUE



HYPERTRIGLYCERIDEMIC WAIST: RELATIONSHIPS WITH METABOLIC ABNORMALITIES/CLINICAL OUTCOMES

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Presence of atherogenic metabolic triad ▪ ↑ Cholesterol/HDL cholesterol ▪ Postprandial hyperlipidemia ▪ Glucose intolerance ▪ Hyperinsulinemia ▪ ↑ Blood pressure | <ul style="list-style-type: none"> ▪ ↑ Risk of cardiovascular disease ▪ ↑ Risk of coronary artery disease ▪ ↑ Annual progression rate of aortic calcification ▪ ↑ Risk of type 2 diabetes |
|--|---|

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Figure 3 Use of hypertriglyceridemic waist as a screening tool to identify individuals likely to be characterized by the cluster of abnormalities of the metabolic syndrome. It is proposed that in presence of an elevated waist circumference, fasti...

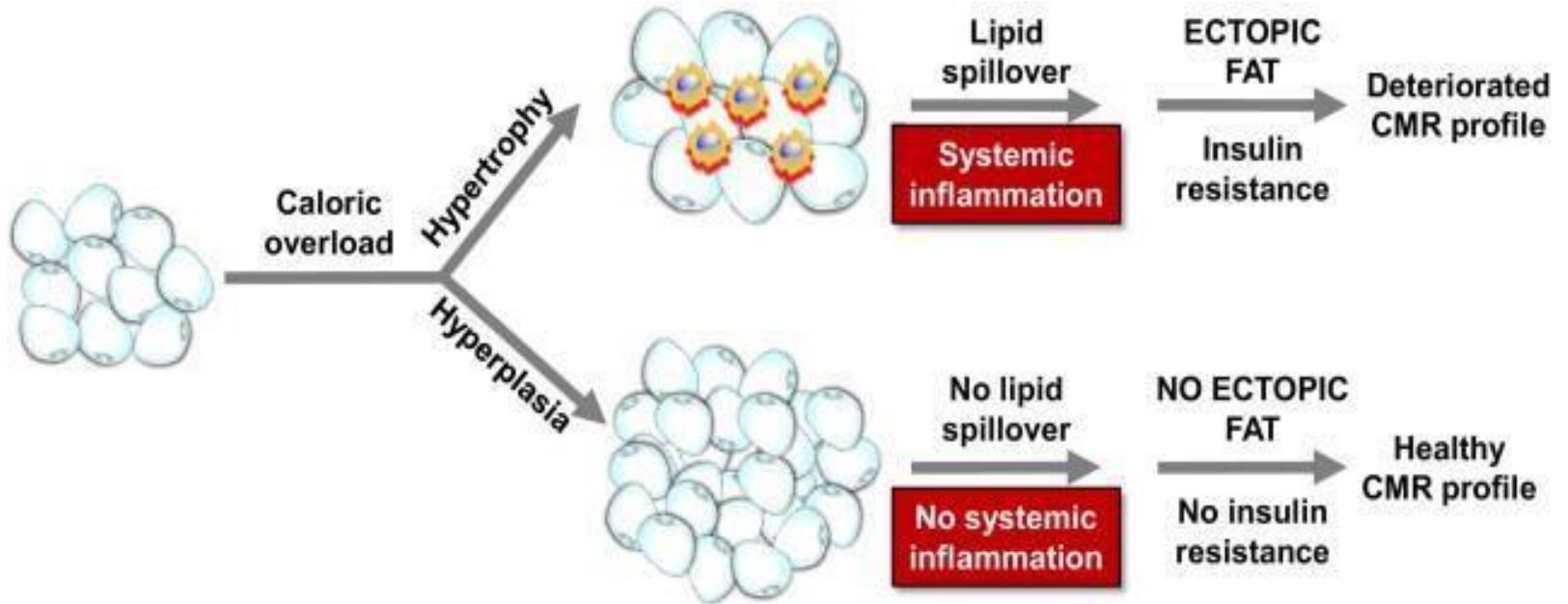


Figure 5 Simplified model to illustrate the concept that when facing a chronic energy surplus, inability of subcutaneous adipose tissue to expand through hyperplasia may lead to hypertrophic and ?inflamed? adipose tissue. Resulting systemic infla...

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<http://dx.doi.org/10.1016/j.cjca.2012.06.004>

QUELS SONT LES FACTEURS NON NUTRITIONNELS PRO-INFLAMMATOIRES

1. Tabac fumé actif ou passif ou fumée de cheminée
2. Sédentarité
3. Pollution environnementale par les particules fines : PM2.5 (particulate matter less than 2.5 μm in diameter)
4. Foyers infectieux chroniques (dentaires osseux ...)

OBÉSITÉ ET INSULINE

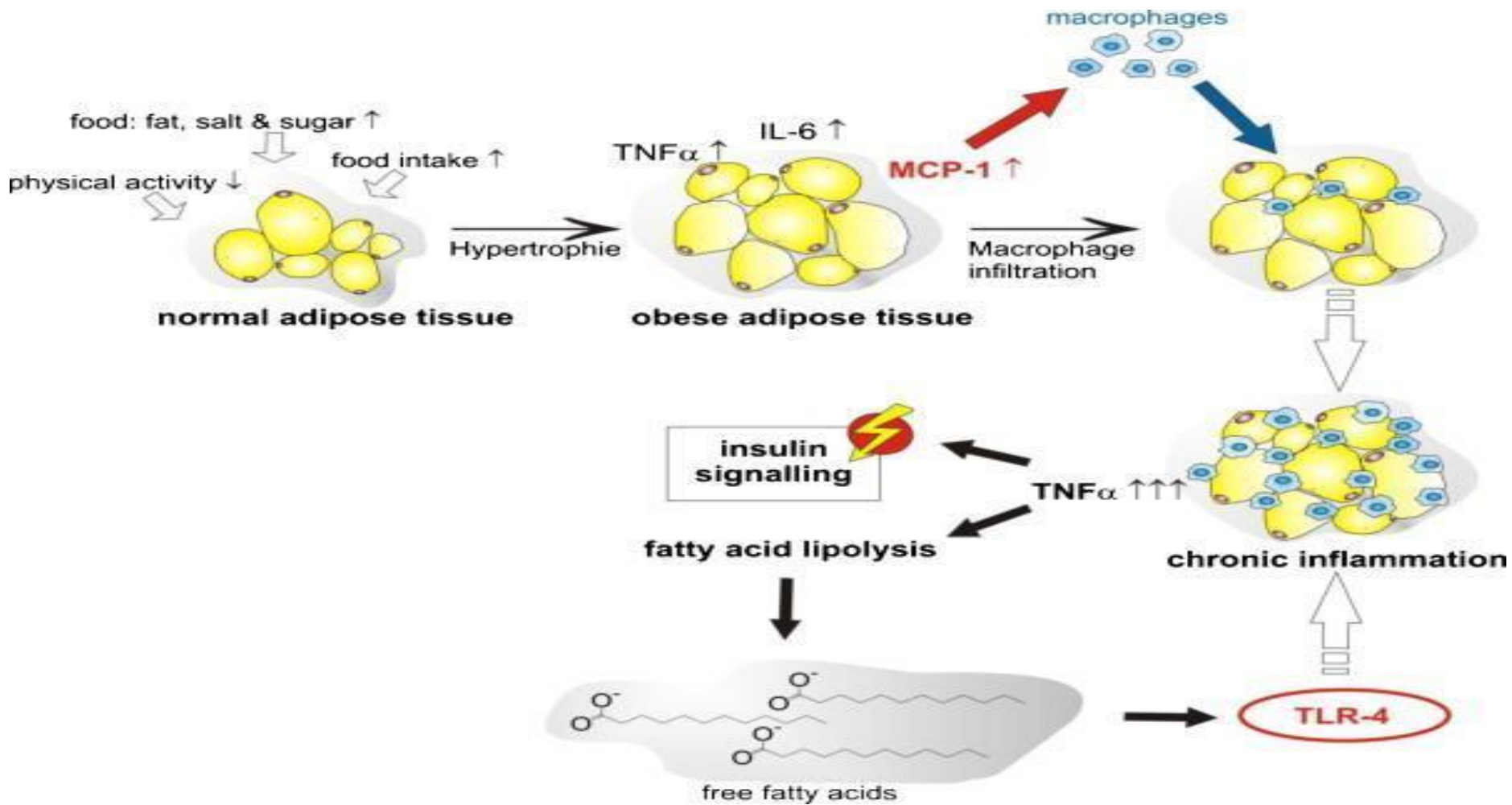
1. Le gras stocké est plus souvent un excès calorique qu'une ingestion de graisses
2. Le signal de stockage est amplifié par l'insuline
3. Les aliments insulinosécréteurs sont pro-inflammatoires
4. Le rôle de la génétique est secondaire comme le démontre l'explosion du D2 et de l'obésité

PROINFLAMMATORY DIET

1. High temperature cooking
2. Burning, charcoaling food on barbecue for instance
3. High insulenic foods (high GI and high GL)
4. Low raw/cooked ratio
5. High intake of refined and/or industrial foods
6. High W6/W3 ratio
7. High intake of W6 PUFA (Sunflower, corn, soy oils)

ANTI-INFLAMMATORY DIET

1. Raw and whole foods
2. Low temperature cooking or steam cooking
3. Low insulenic foods (low GI and low GL)
4. High intake in micronutrients
5. High intake of W3 PUFA especially long W3 PUFA
6. High W6/W3 ratio
7. High intake of spices, herbs, aromats and naturally occurring anti-inflammatory nutrients (Turmeric, garlic, lipoic acid...)



Alois Jungbauer, Svjetlana Medjakovic

Anti-inflammatory properties of culinary herbs and spices that ameliorate the effects of metabolic syndrome

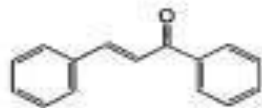
Maturitas Volume 71, Issue 3 2012 227 - 239

<http://dx.doi.org/10.1016/j.maturitas.2011.12.009>

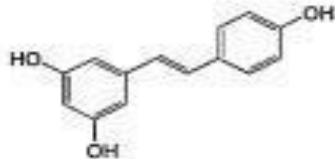
Fig. 1 Schematic overview of how metabolic syndrome develops from adipose tissue <ce:cross-ref refid="bib0035"> [7]</ce:cross-ref> .

POLYPHENOLS

Chalcones



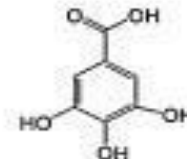
Stilbenes



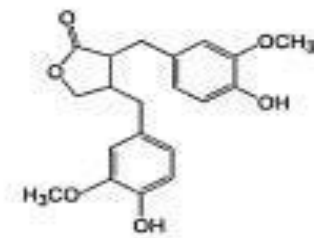
Flavonoids



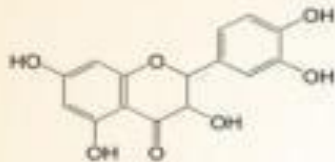
Phenolic acids



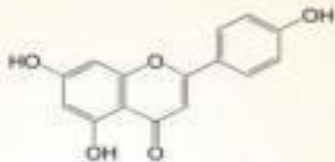
Lignans



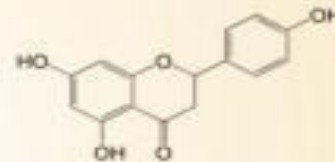
Flavanonols



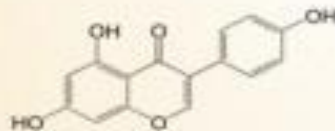
Flavones



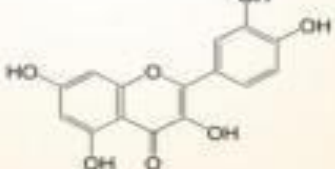
Flavanones



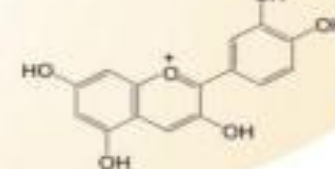
Isoflavonoids



Flavonols



Anthocyanidins



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<http://dx.doi.org/10.1016/j.maturitas.2011.12.009>

Fig. 2 Overview of the different classes of polyphenols, though some phenolic acids are not strictly polyphenols. Examples for the different classes are given, being matairesinol as lignan, gallic acid as phenolic acid, trans...

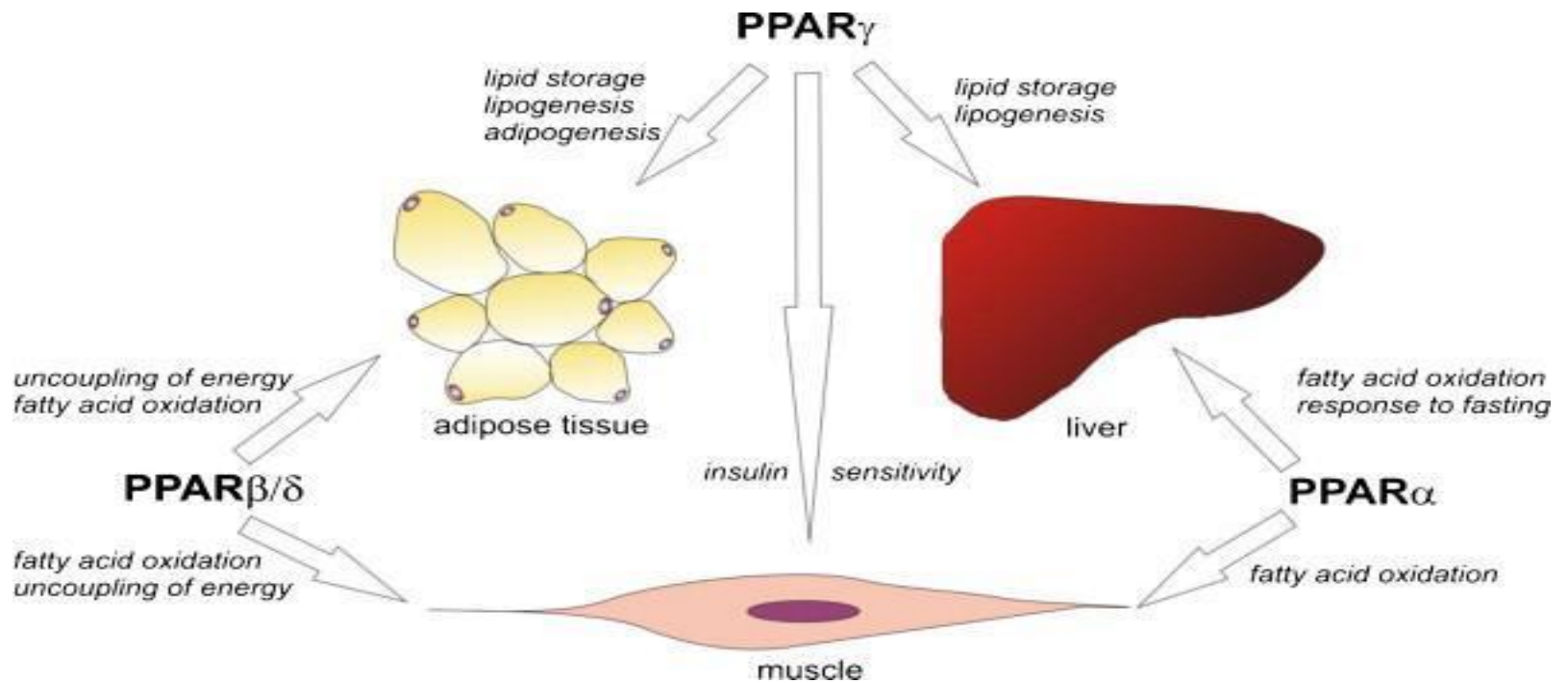


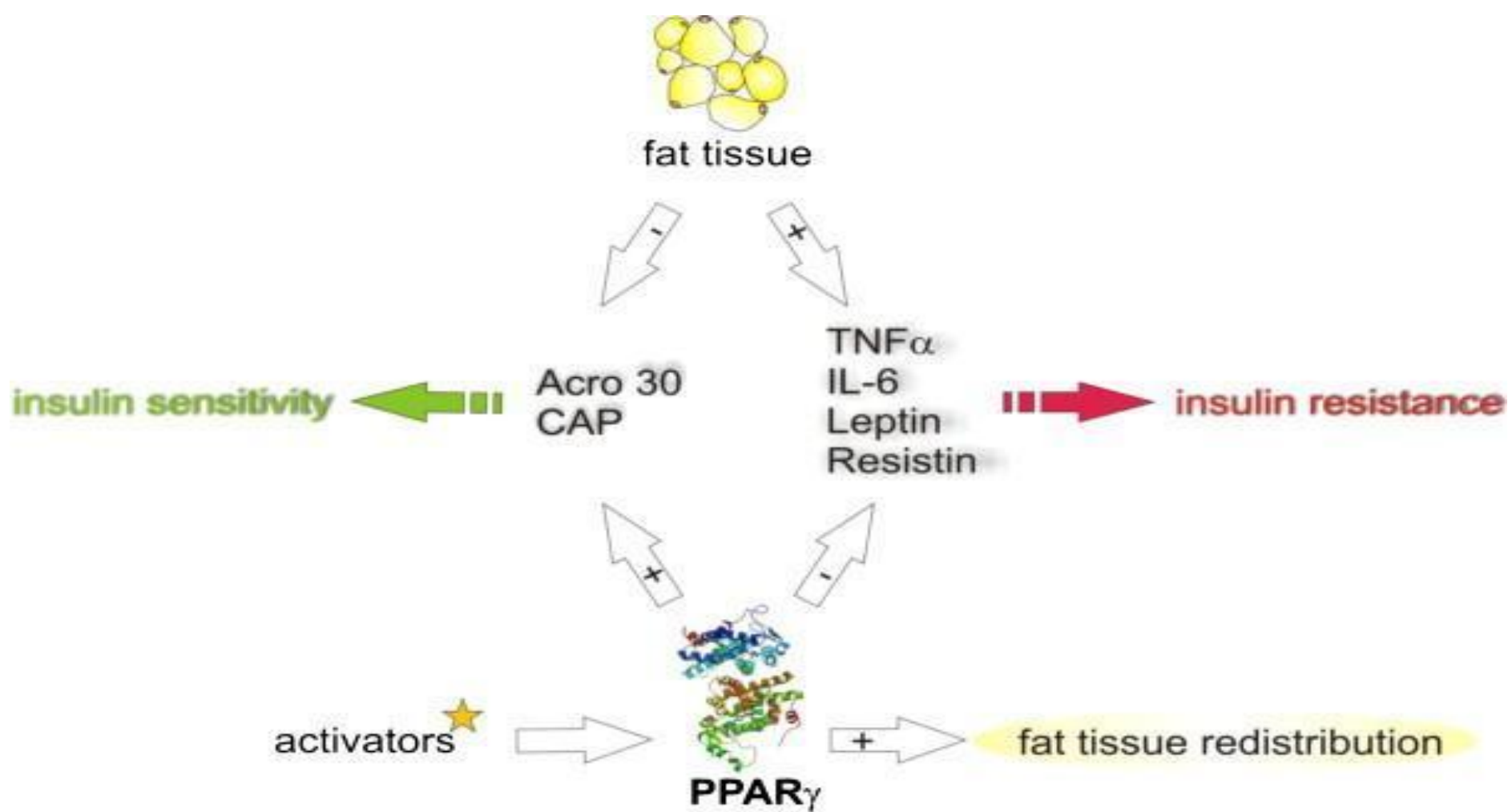
Fig. 3 Overview of how PPARs are involved in fat storage, lipogenesis, and adipogenesis.

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Anti-inflammatory properties of culinary herbs and spices that ameliorate the effects of metabolic syndrome

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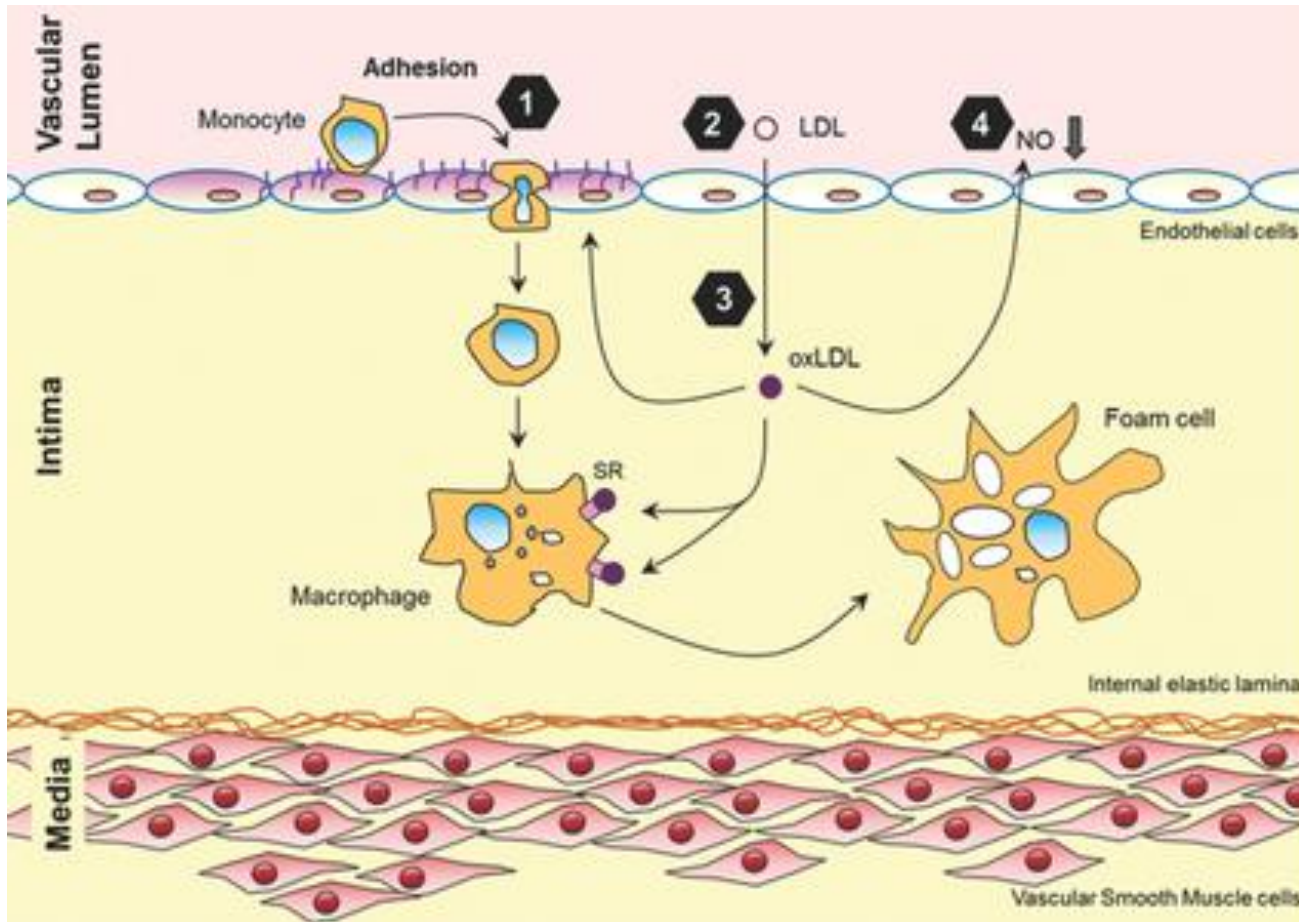
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Fig. 4 Effects induced by PPAR γ that affect fat tissue remodelling or insulin resistance or sensitivity.

DIETARY OATS AND MODULATION OF ATHEROGENIC PATHWAYS



1. Anti-inflammatory effects

Oat polyphenols reduce the amount of adhesion molecules on the endothelial surface, resulting in less monocyte recruitment to the vascular wall.

2. Reduction of plasma cholesterol

The cholesterol-lowering effect of oats reduce the chance of LDL being trapped in the vascular wall.

3. Antioxidative capacity

Oat antioxidants prevent oxidation of LDL and scavenge other reactive oxygen species.

4. Maintained endothelial function

Oats may preserve nitric oxide production and thereby counteract endothelial dysfunction.

CONCLUSION

1. L'inflammation a été une adaptation de survie contre les micro-organismes
2. La disparition du péril infectieux nous laisse très vulnérable à l'inflammation chronique
3. De surcroît le mode de vie sédentaire et l'alimentation industrielle sont pro-inflammatoires
4. En prévention primaire ou secondaire un régime anti-inflammatoire est utile dans les maladies chroniques
5. Les régimes crétois, japonais, paléo sont anti-inflammatoires