

8th International Conference Acute Cardiac Care

Inflammatory biomarkers

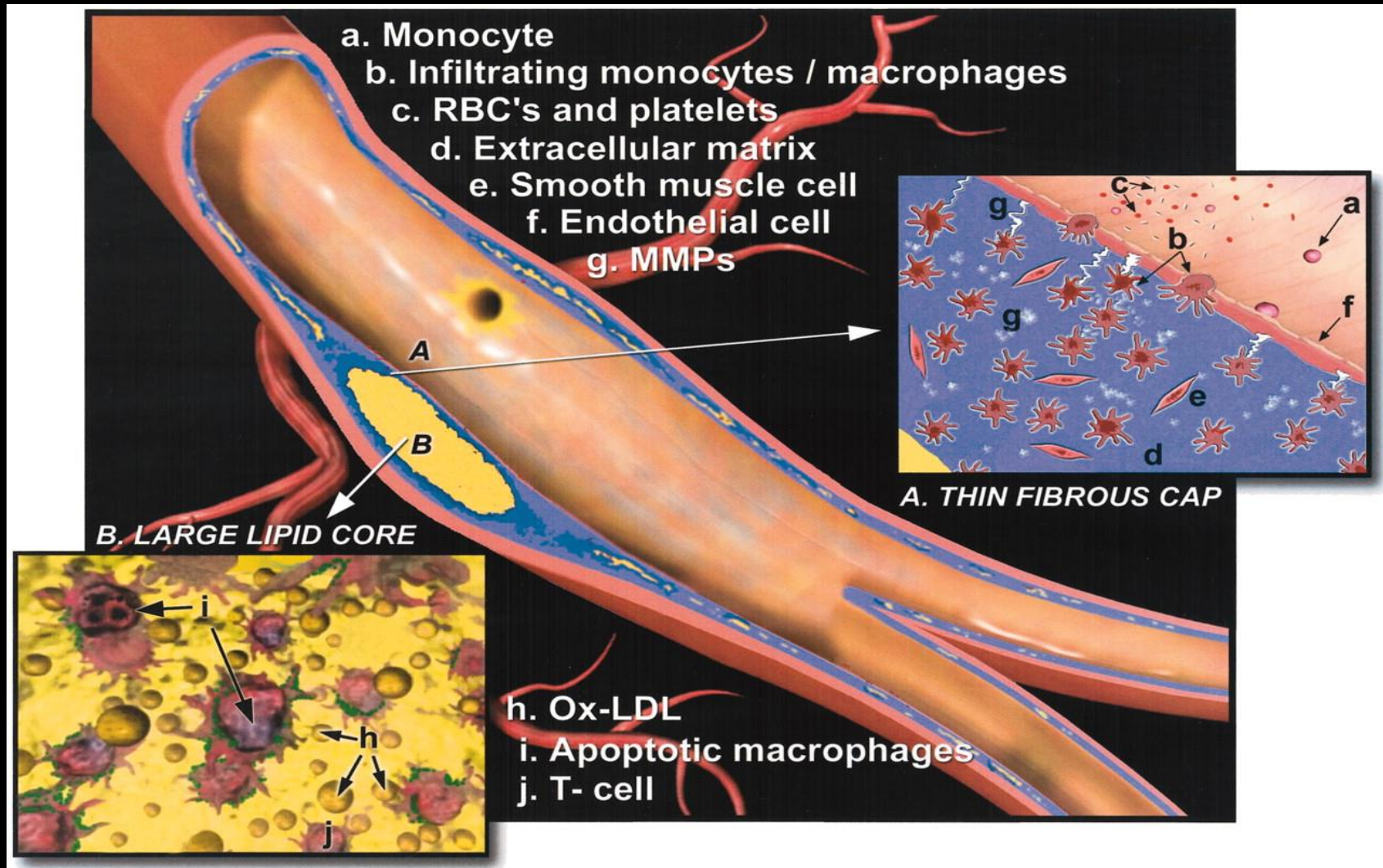
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What is the role of inflammatory biomarkers in ACS

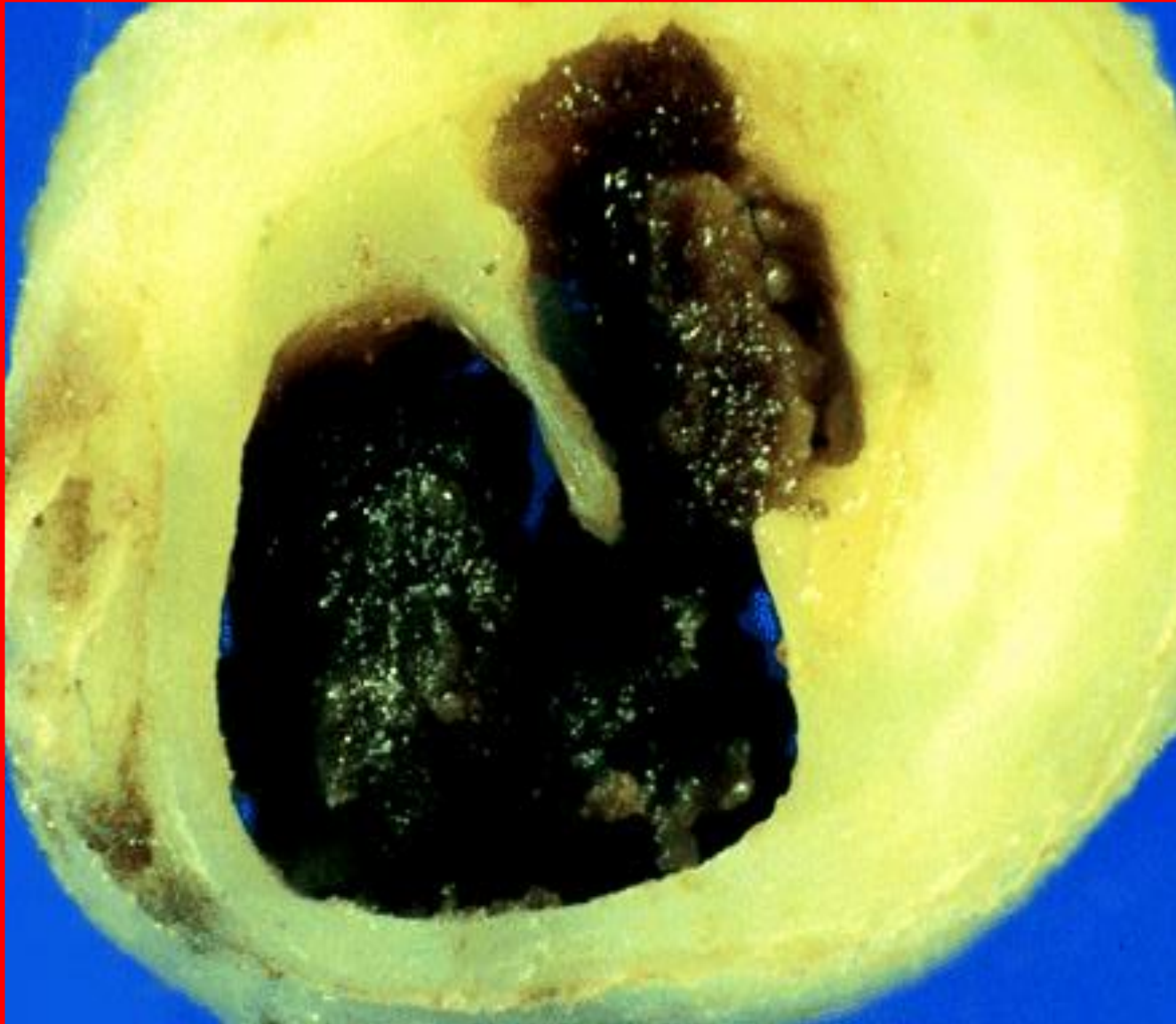
- **Improve diagnosis?**
- **Improve risk stratification?**
- **Guide treatment?**

The search for the “Holy Grail”: the vulnerable plaque



(Naghavi et al, Circulation 2003)

Plaque fissure



Mechanisms of progression in CAD: role of healed plaque disruption

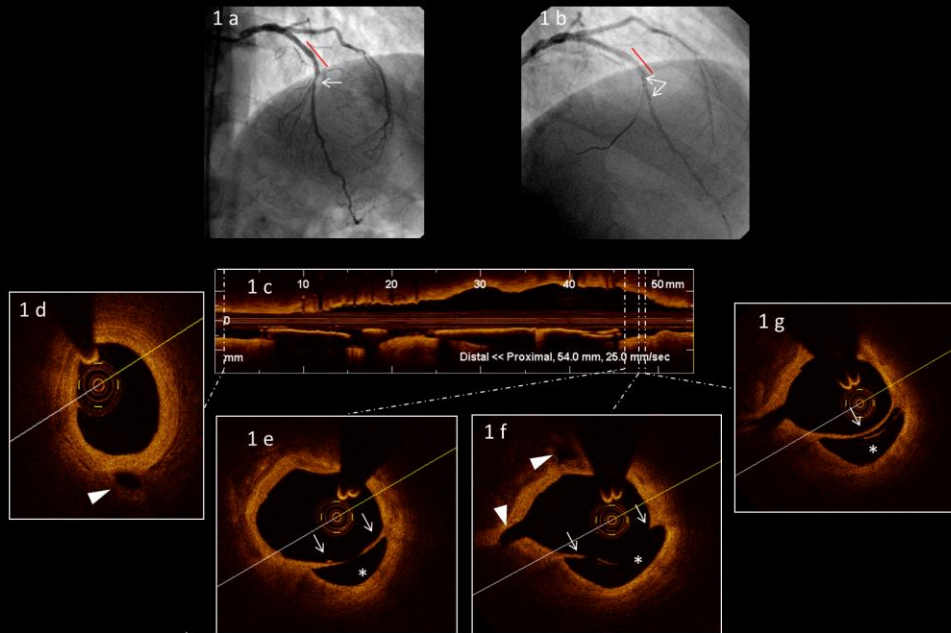


Subclinical episodes of plaque disruption followed by healing are a frequent stimulus to plaque growth.

(Mann & Davies, Heart 1999)

“Stable” plaque fissure

Baseline



(Prati et al, JACC Cardiovasc Int. 2013)

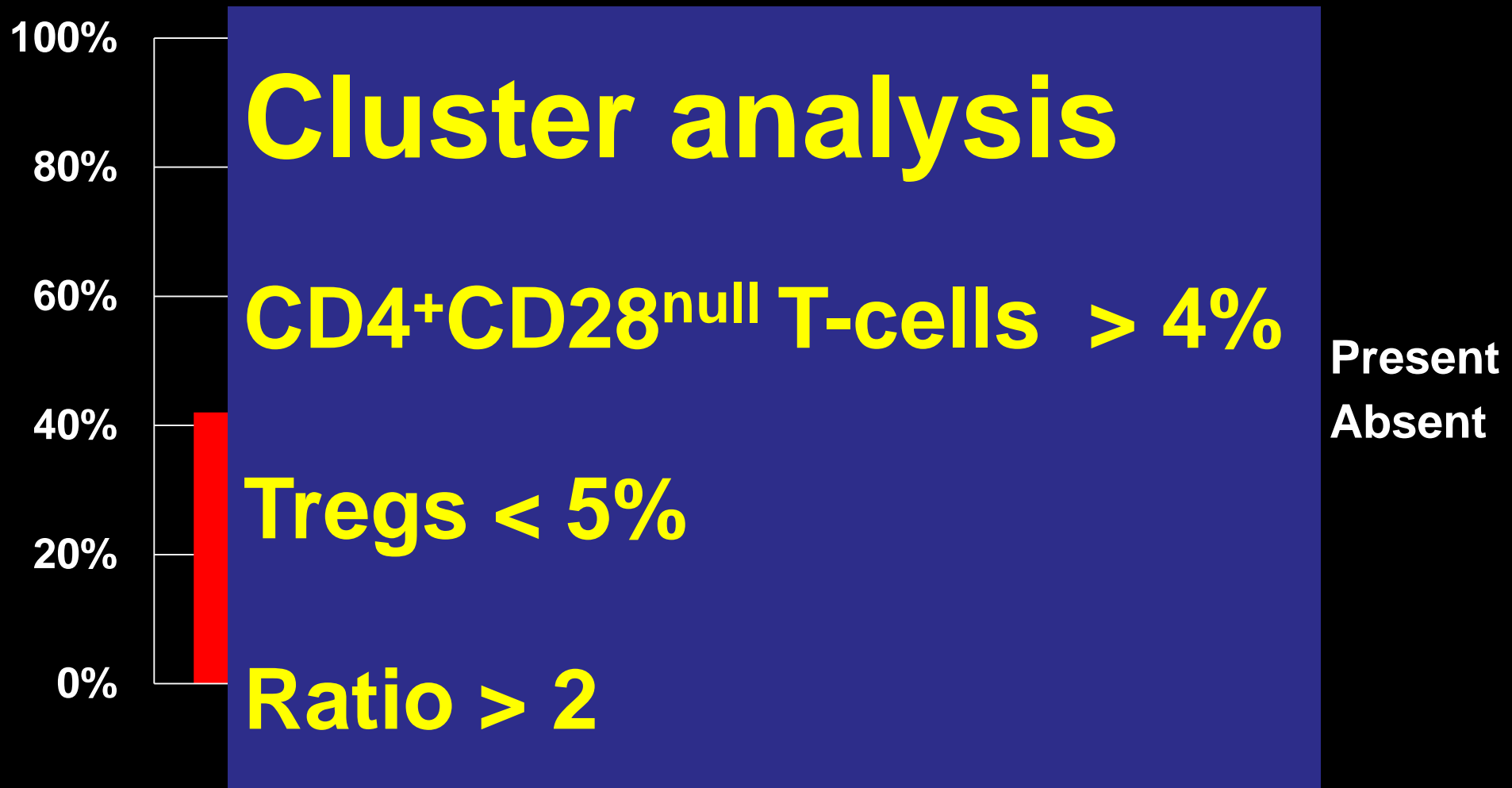
Plaque erosion



The search for the “Holy Grail”: plaque inflammation

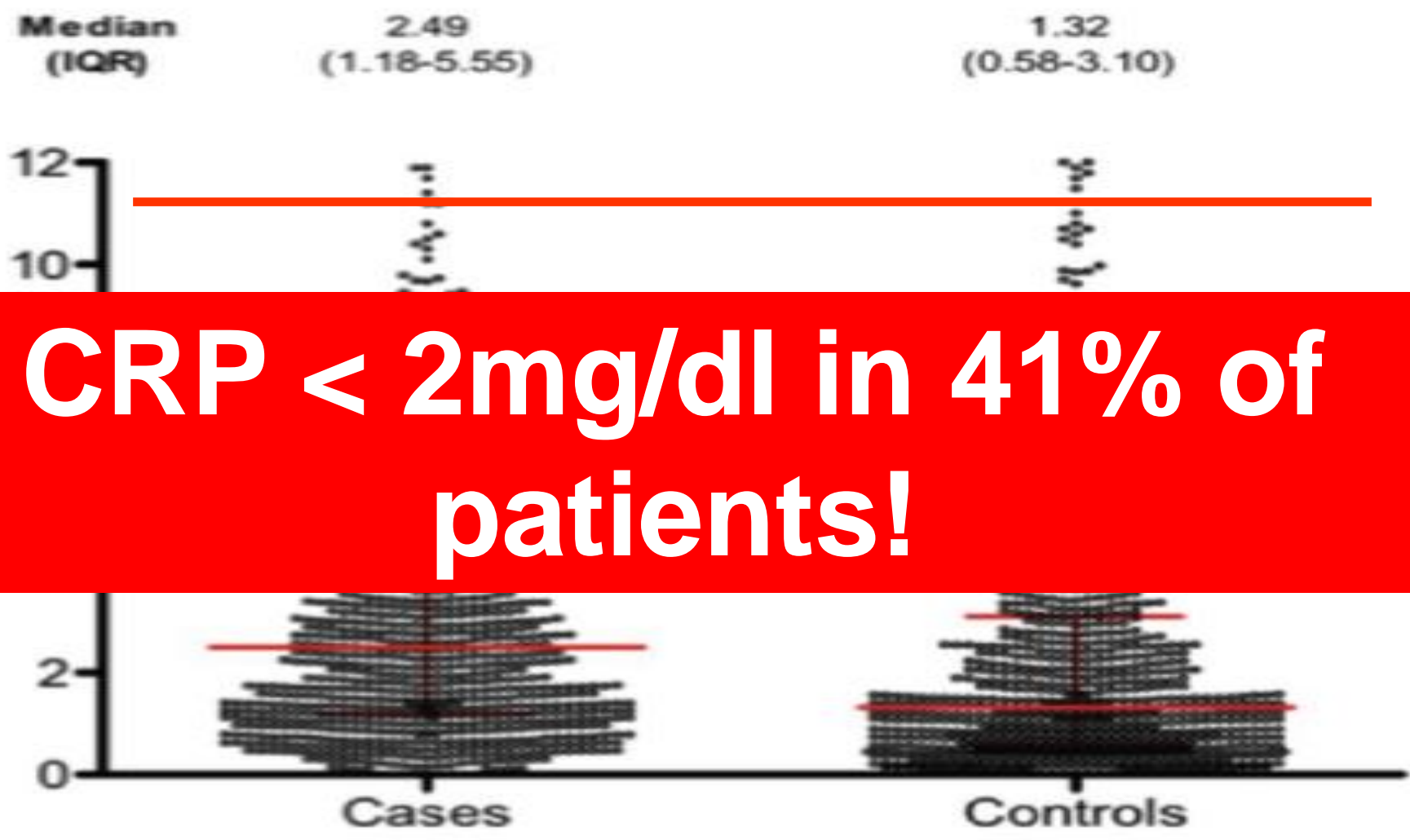
- **C-reactive protein**
 - Berk et al, AJC 1990
 - Liuzzo et al, NEJM 1994
- **Neutrophils**
 - Dinerman et al, JACC 1990
 - Biassucci et al, JACC 1994
- **Monocytes**
 - Mazzone et al, Circulation 1993
- **Lymphocytes**
 - Seneri et al, Circulation 1992

Identification of a unique adaptive immune signature in ACS



(Liuzzo et al, IHJ 2013)

Association between plaque inflammation and CV events



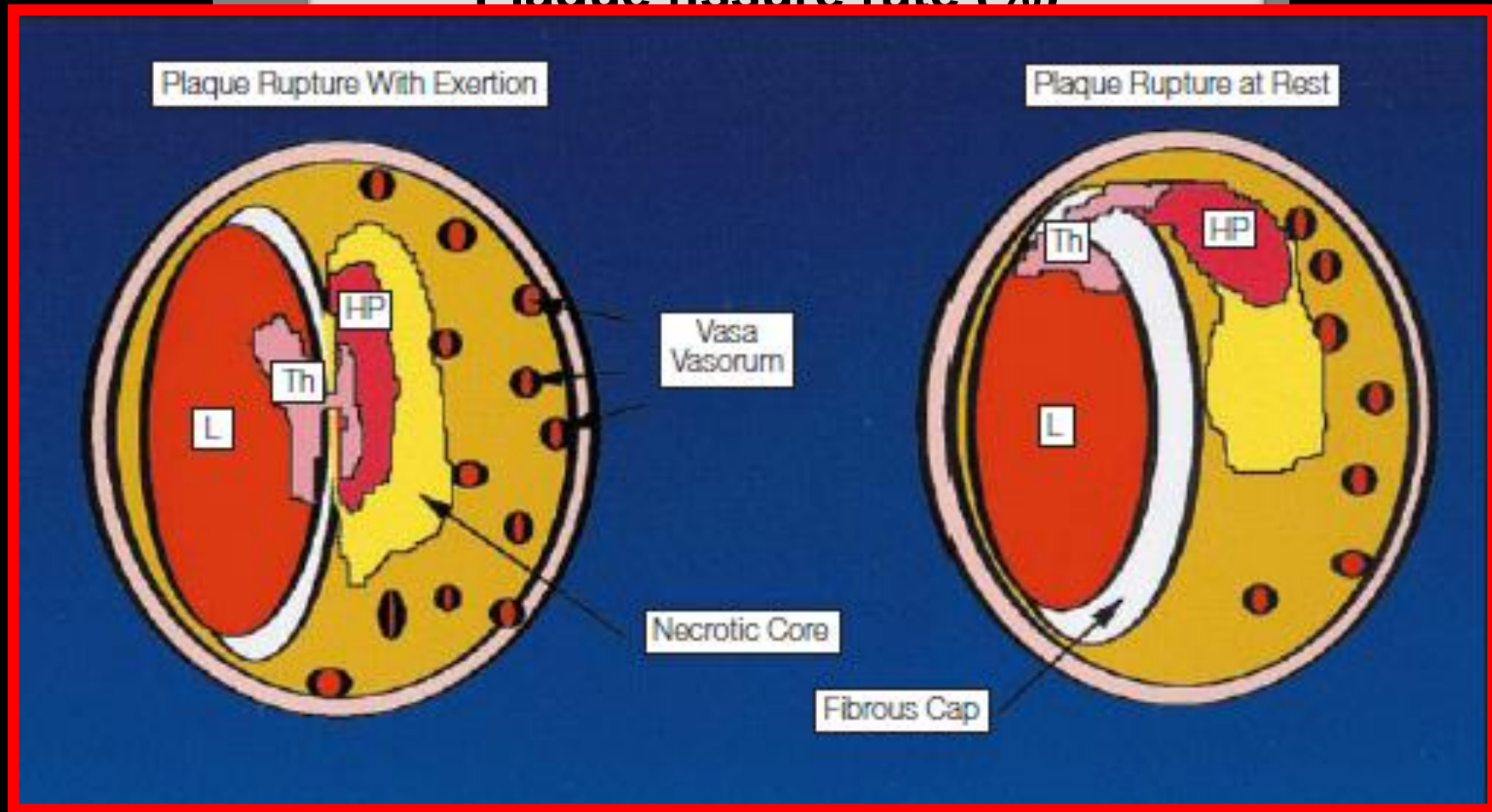
CRP < 2mg/dl in 41% of patients!

(Cianflone et al, JACC 2011)

Mechanical triggers of plaque fissure: stress

80

Plaque fissure rate (%)



Stress

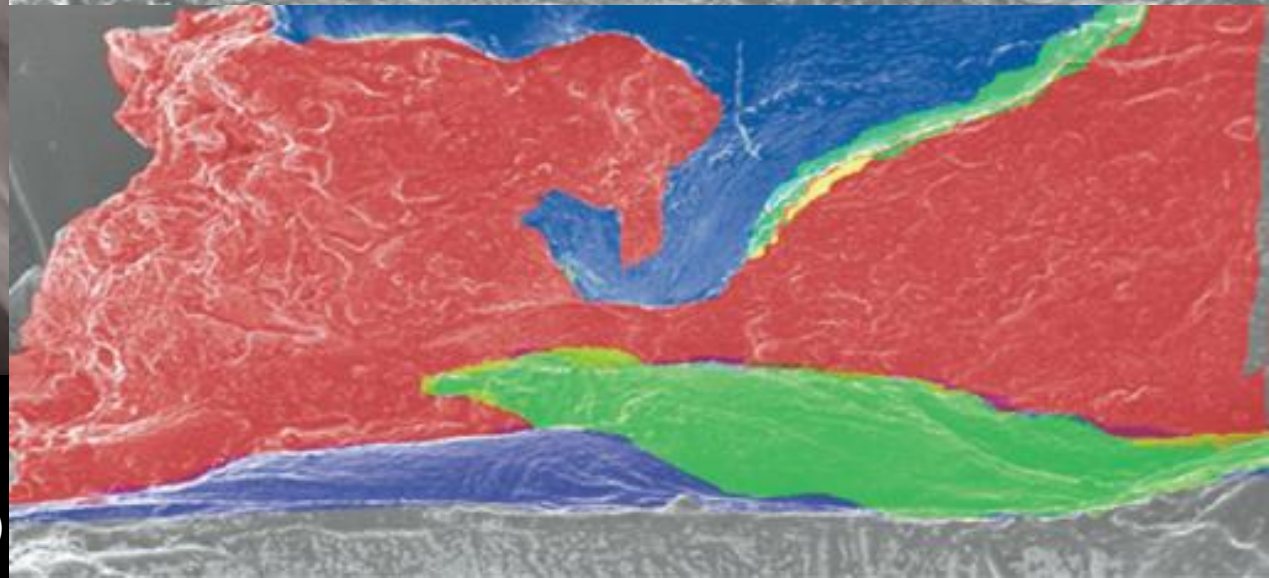
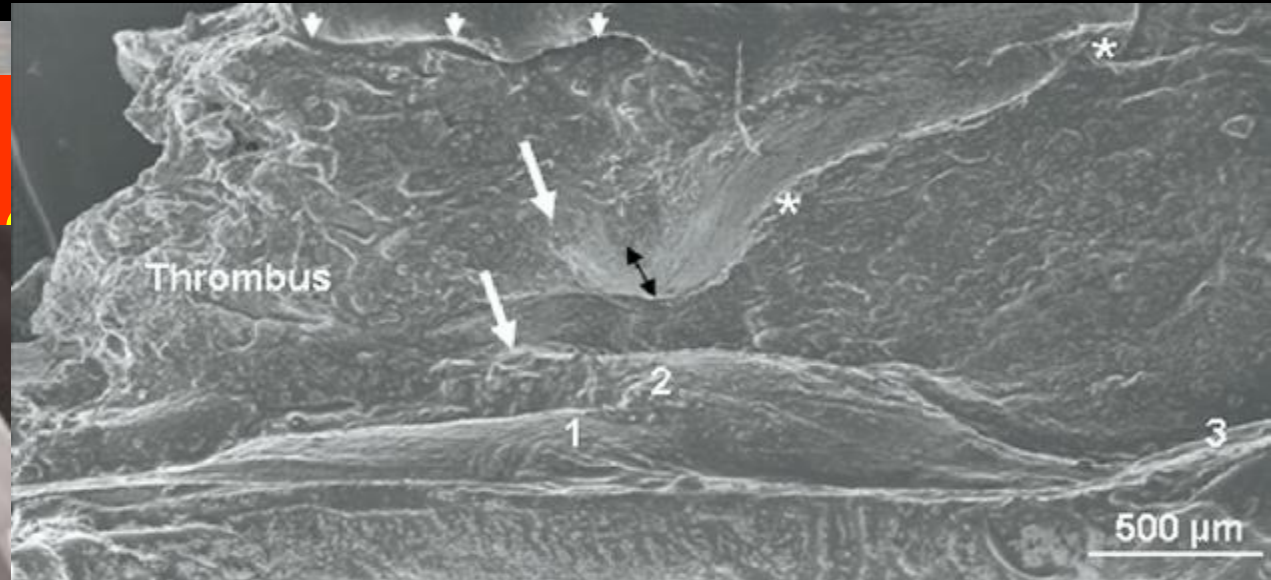
Rest

(Burke et al, JAMA 1999)

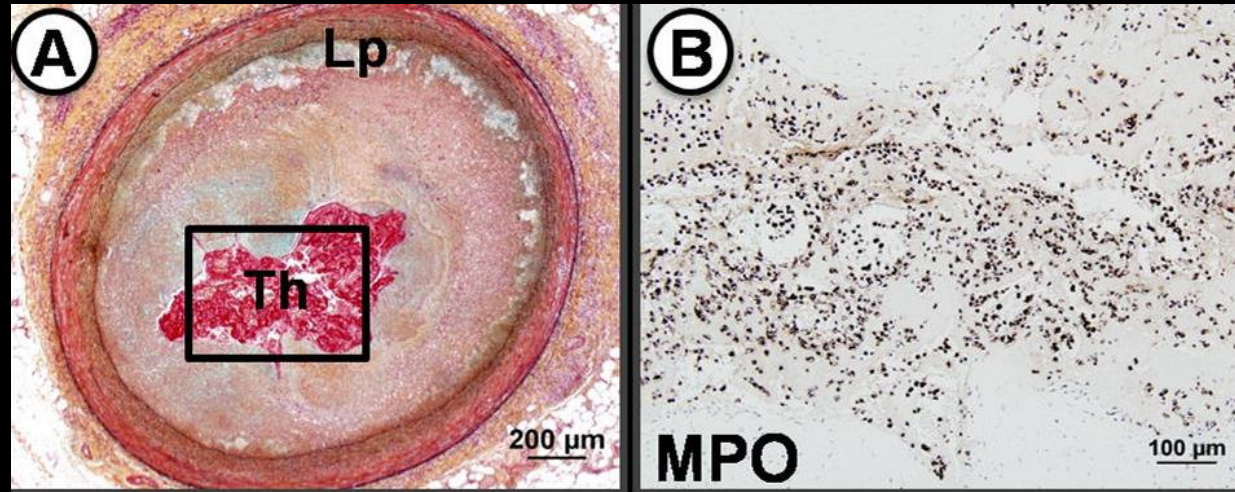
Mechanical triggers of plaque fissure: cholesterol crystals

Factors affecting cholesterol crystallization

- Cholesterol saturation
- Hydration
- Temperature
- pH

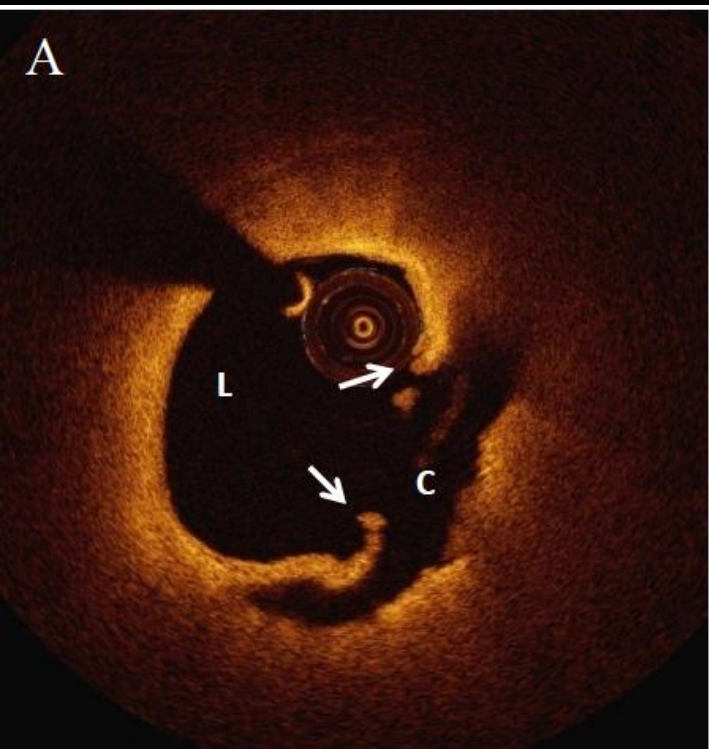


Myeloperoxidase is Associated with Coronary Plaque Erosion

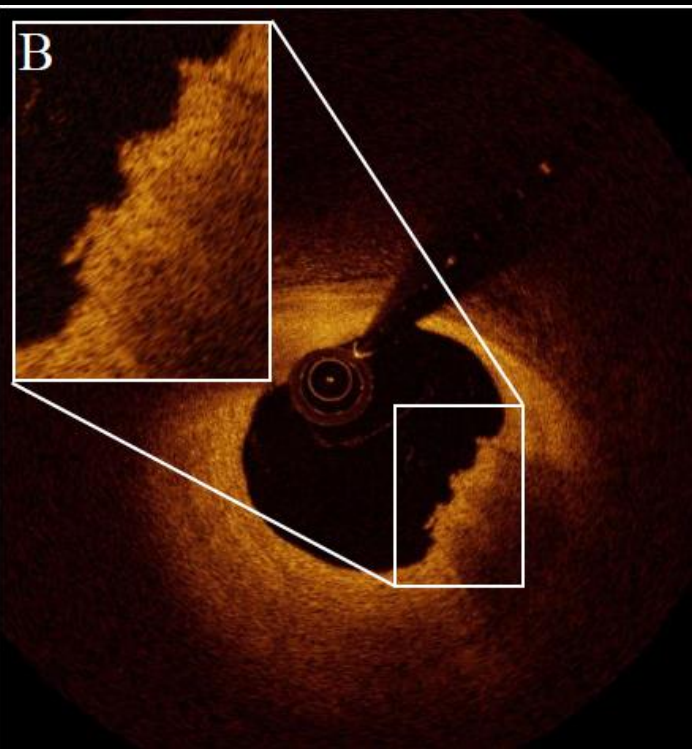


(Ferrante et al, Circulation 2010)

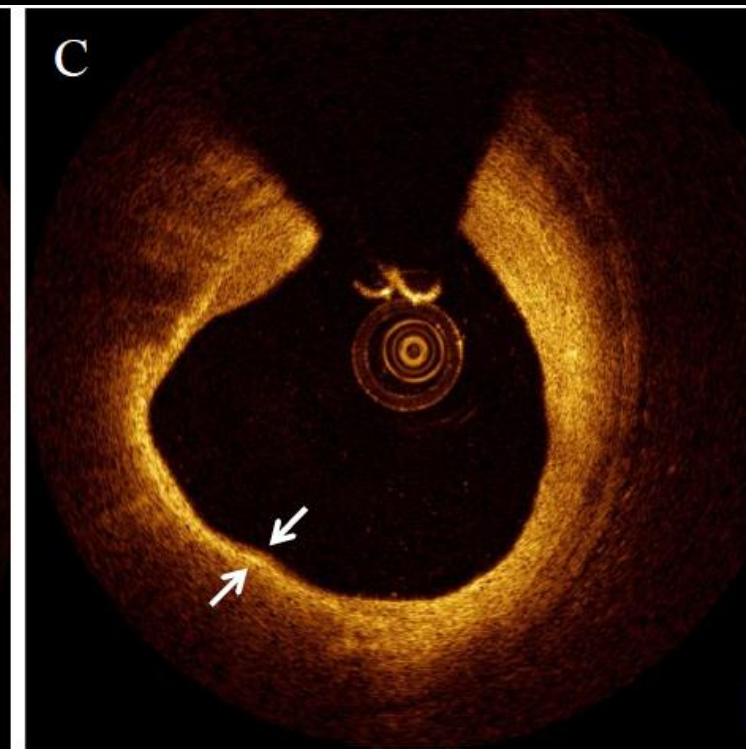
Rupture



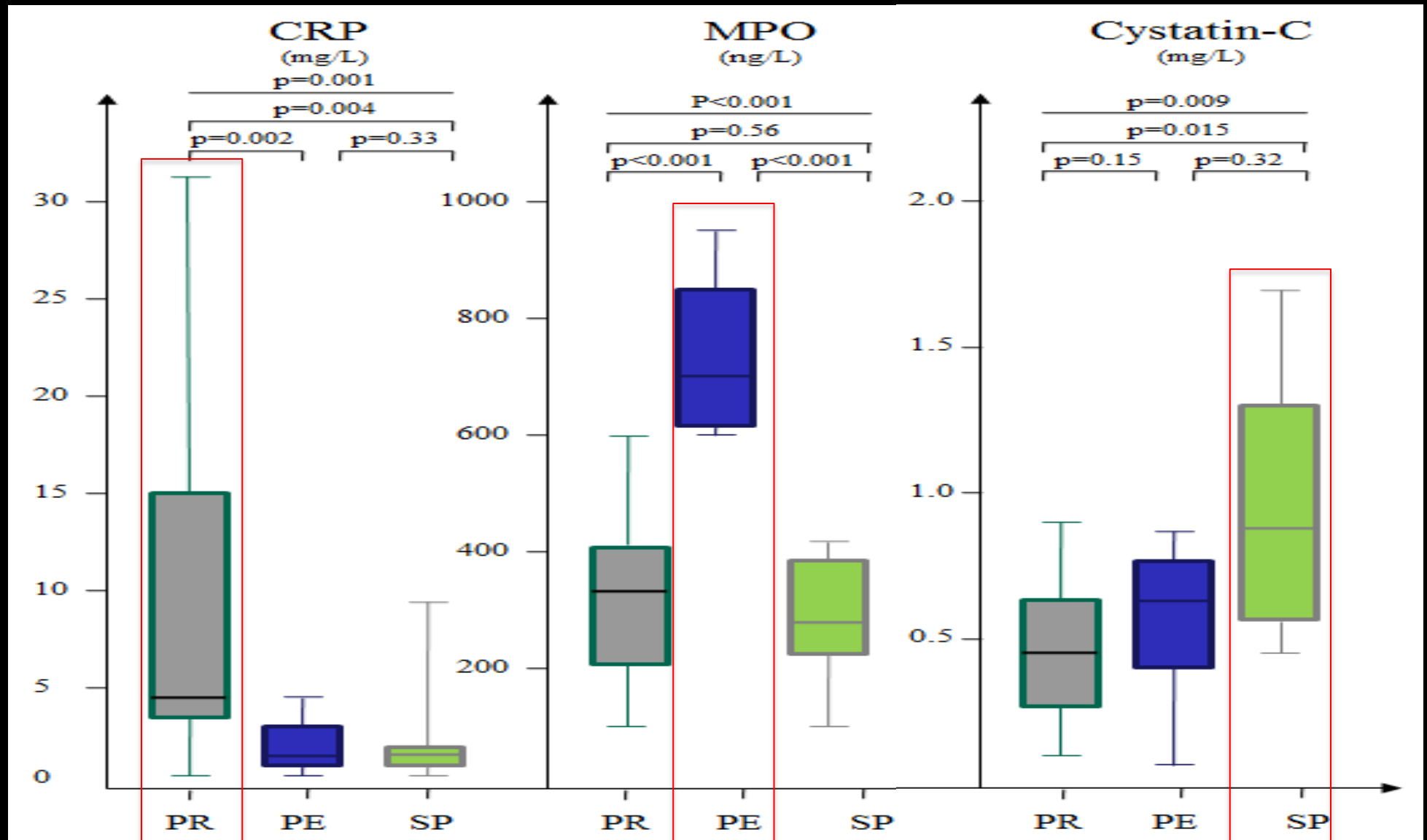
Erosion



Smooth plaque

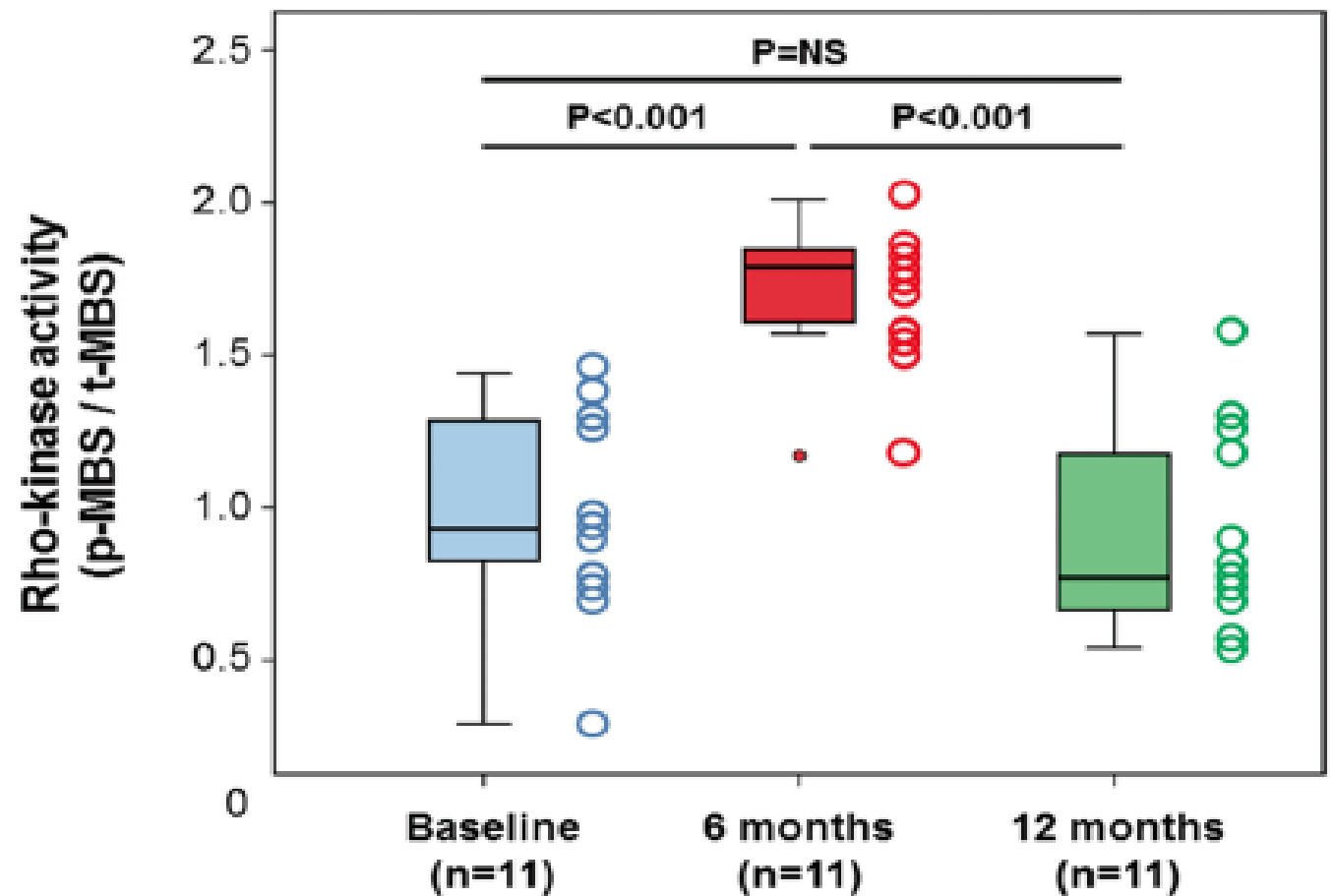
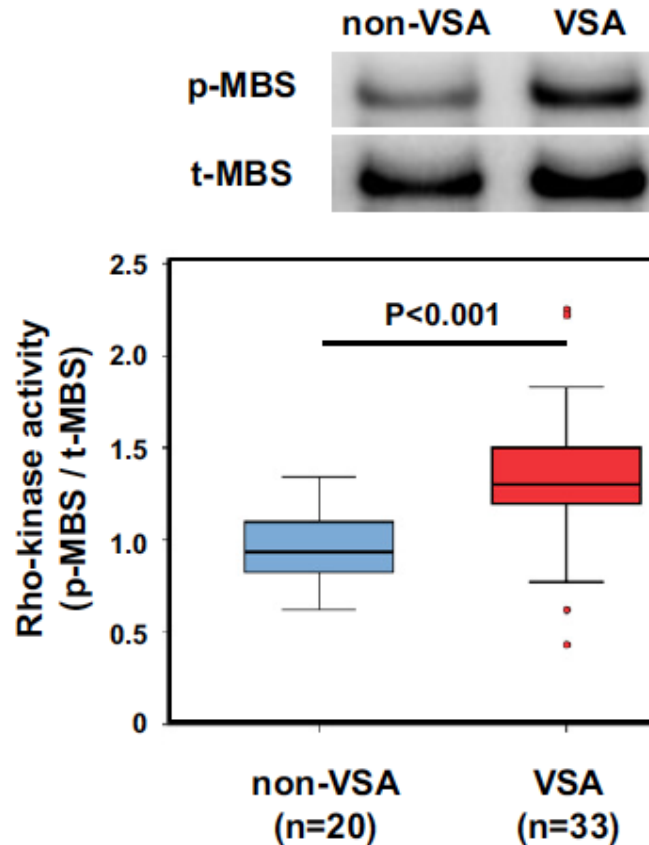


Morpho-functional correlations in NSTE-ACS



(Niccoli et al, submitted)

Rho kinase activity and coronary spasm

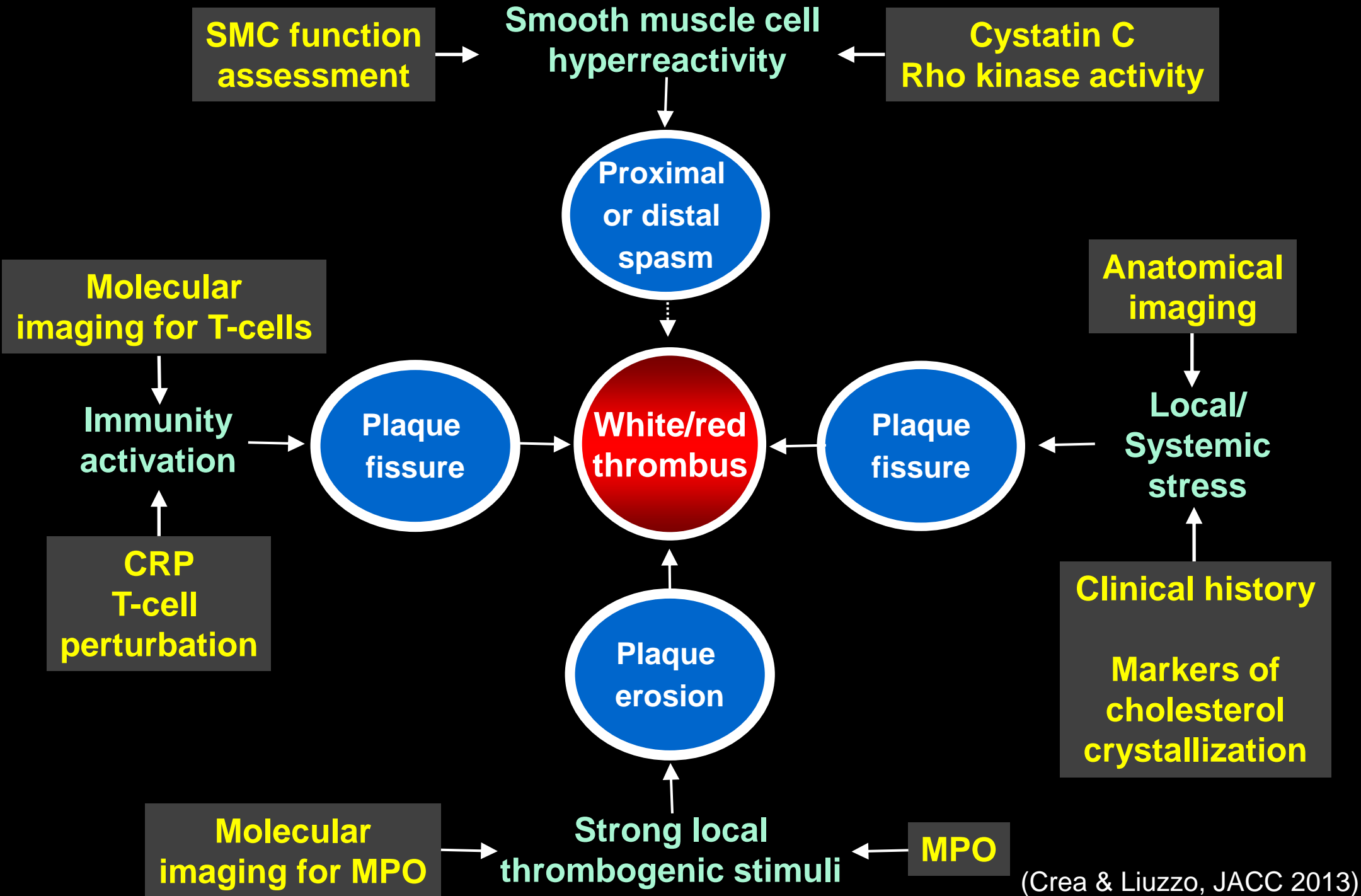


(Kikuchi et al, JACC 2011)

(Nihei et al, Circ J 2012)

The search for the “Holy Grails”

- **Clinical characterization**
 - Psychological or physical stress
 - Recent infections or chronic inflammatory diseases
- **Antomical non invasive imaging**
- **Functional non invasive imaging**
 - Inflammatory cell activation within the plaque
- **Biomarkers**



It is complex

**I am sorry,
it is not my fault!**