FLAVIOLA

Targeted delivery of dietary flavanols for optimal human cell function: Effects on cardiovascular health

SFRBM Annual Meeting, Pre-meeting Workshop II

Flavanols in Health and Disease

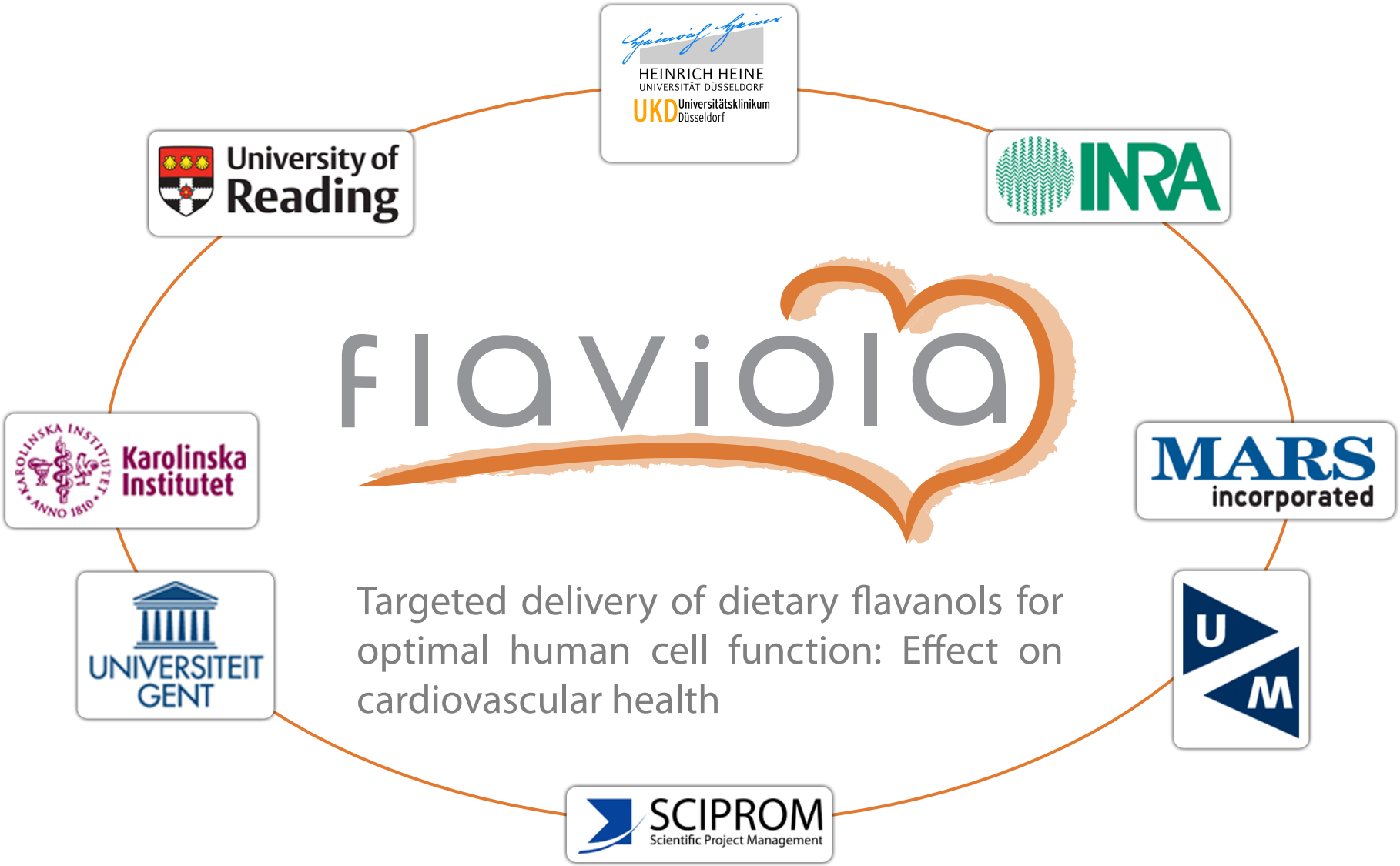
Flavanols and Cardiovascular Health: Current Perspectives

Marc W. Merx & Malte Kelm, University of Düsseldorf

San Diego, 14 November 2012

Correlations in epidemiology

Diets rich in plant foods are strongly associated with a decreased risk in cardiovascular disease.


HEINRICH HEINE
UNIVERSITÄT DÜSSELDORF
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flaviola
Karolinska Institutet
MARS incorporated
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SCIPROM
Scientific Project Management
Targeted delivery of dietary flavanols for optimal human cell function: Effect on cardiovascular health

The Mission of FLAVIOLA

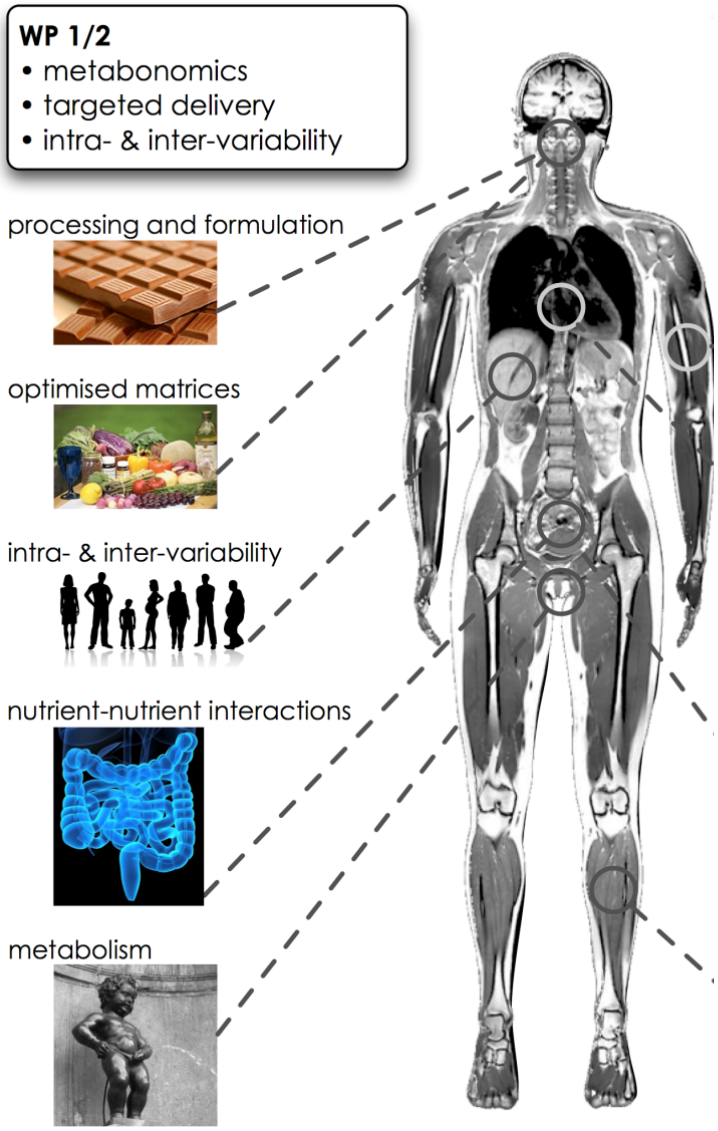
FLAVIOLA **aims at:**

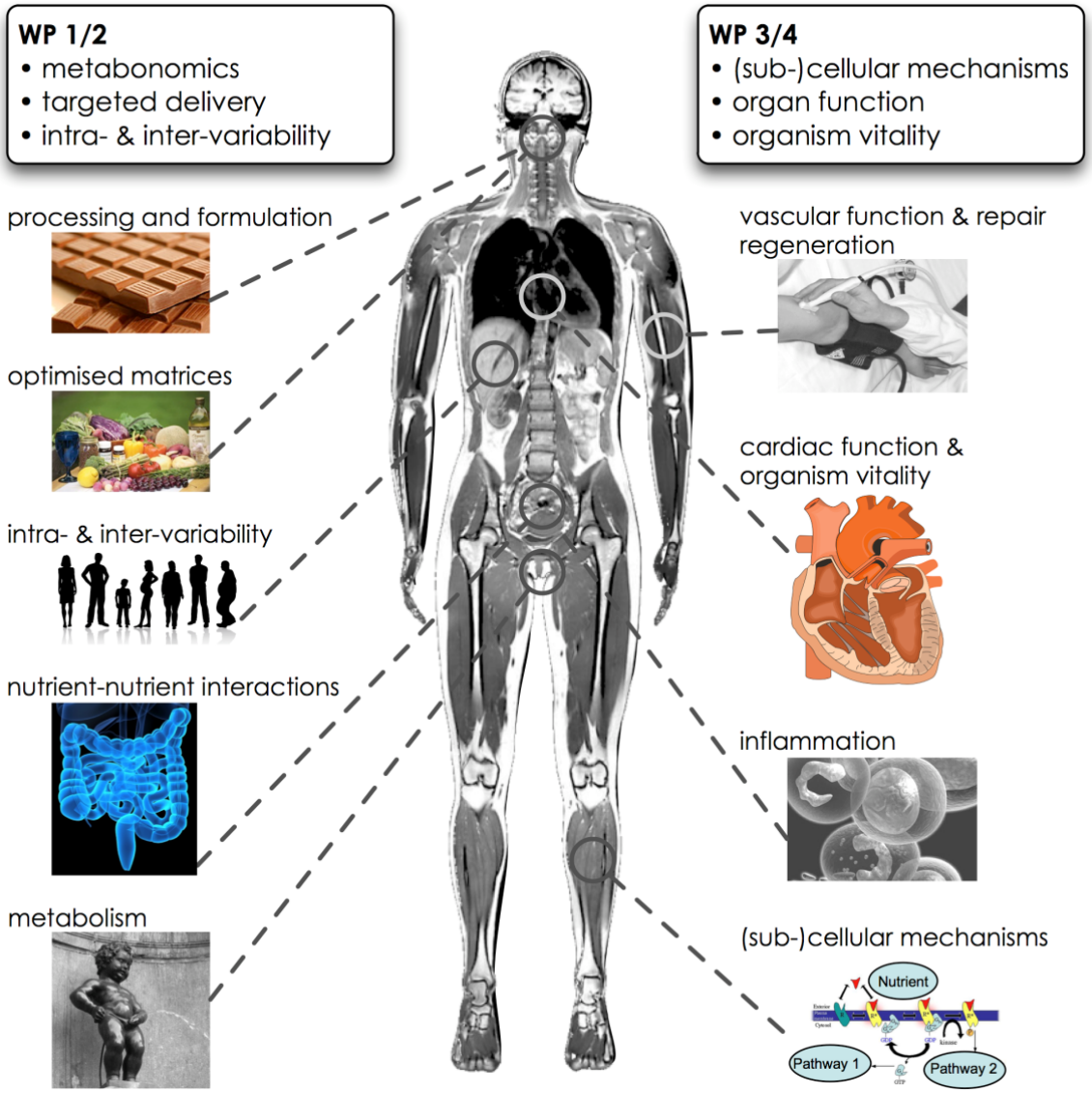
(i) illuminating the **cellular and sub-cellular effects** of flavanols and their main human metabolites;

(ii) investigating key parameters of dietary **flavanol absorption**, clearance and efficacy towards surrogate markers of **cardiovascular function** in humans;

(iii) **developing innovative, functional, and nutritionally responsible food matrices** for optimised dietary flavanol delivery;

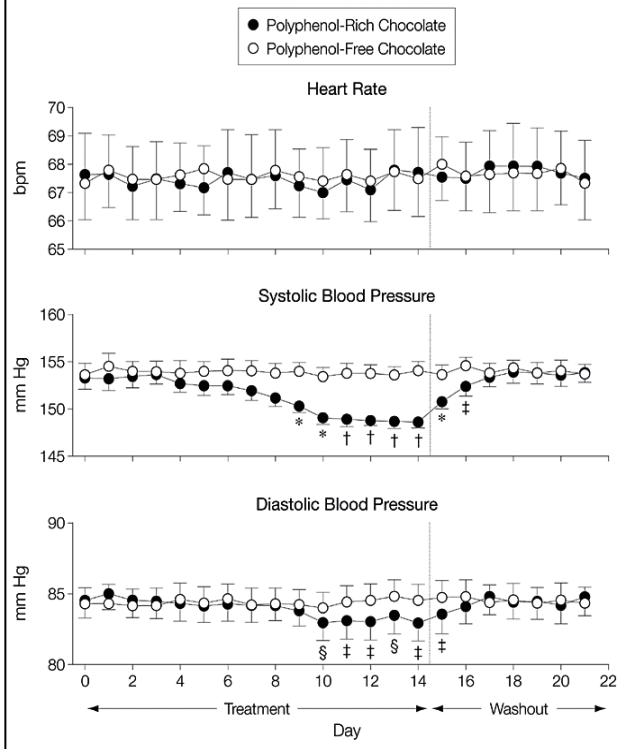
(iv) and finally demonstrating **cardiovascular benefits and safety** for a newly developed prototype food product


WP 1/2
• metabonomics
• targeted delivery
• intra- & inter-variability
processing and formulation
optimised matrices
intra- & inter-variability
nutrient-nutrient interactions
metabolism


WP 1/2
• metabonomics
• targeted delivery
• intra- & inter-variability
WP 3/4
• (sub-)cellular mechanisms
• organ function
• organism vitality
processing and formulation
optimised matrices
intra- & inter-variability
nutrient-nutrient interactions
metabolism
vascular function & repair
regeneration
cardiac function &
organism vitality
inflammation
(sub-)cellular mechanisms
Nutrient
Pathway 1
Pathway 2

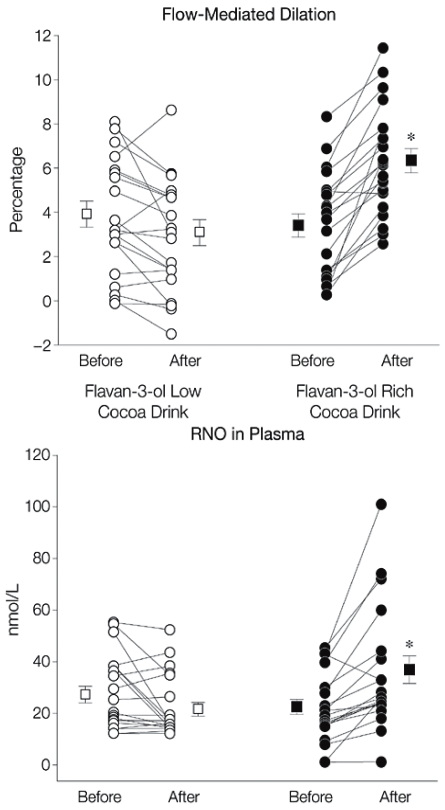
Early dietary intervention studies

Blood Pressure



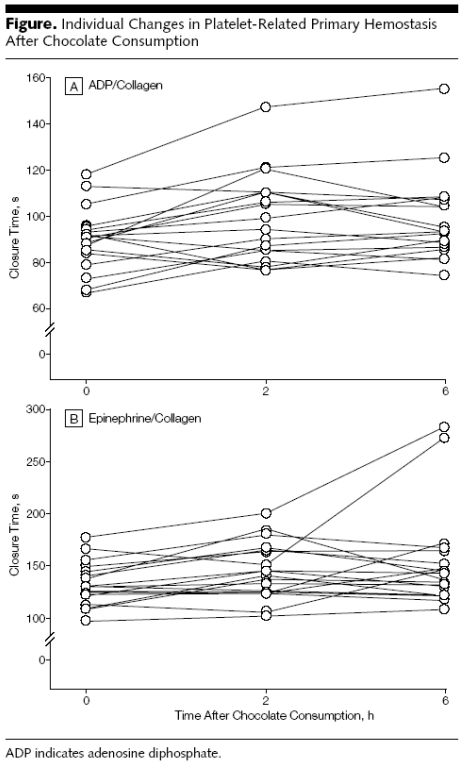
Taubert et al, JAMA, 2003;290(8):1029-30

Endothelial Function



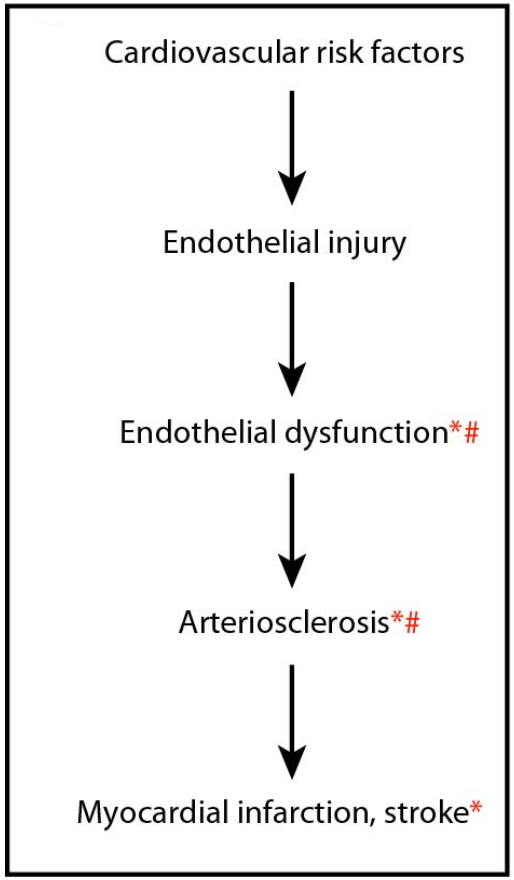
Heiss et al, JAMA, 2003;290(8):1030-1

Platelet Reactivity



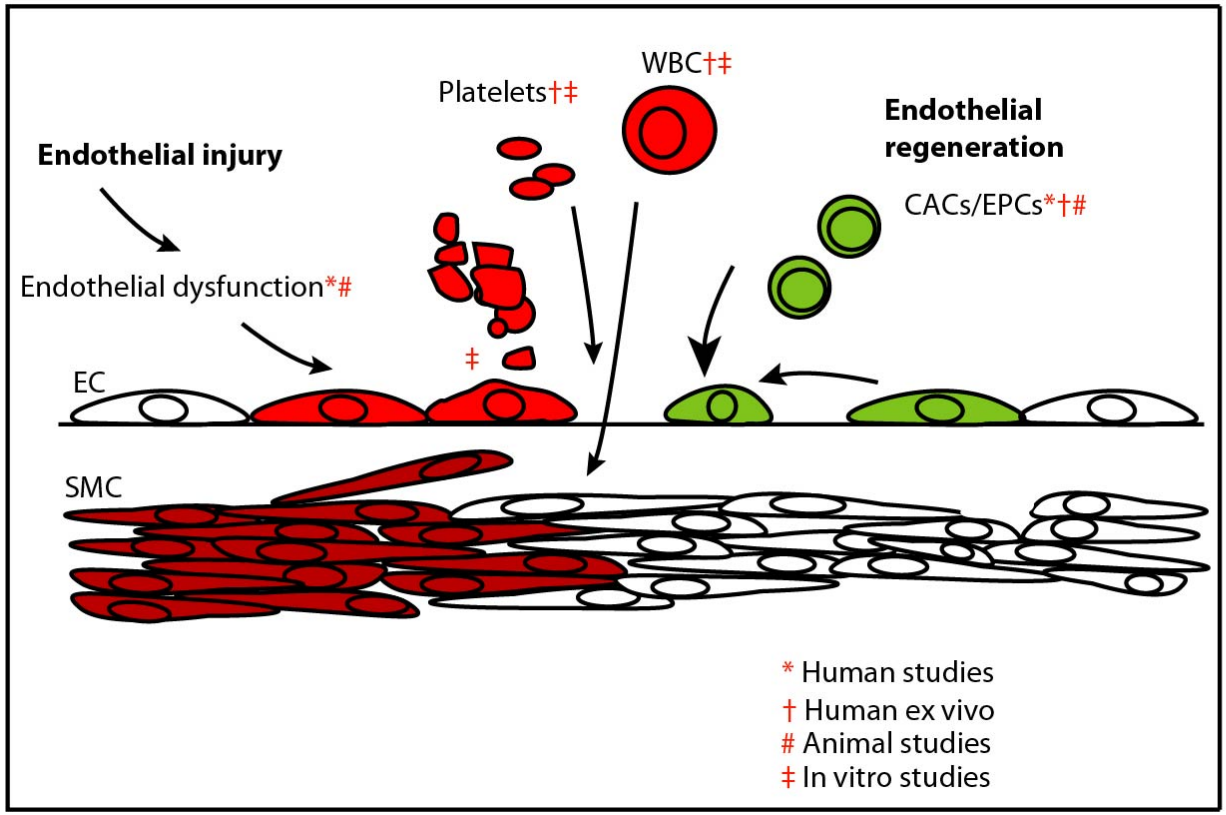
Holt et al, JAMA. 2002: 2212-3.

Dietary Flavonoids
- Potential Mechanisms (I) -



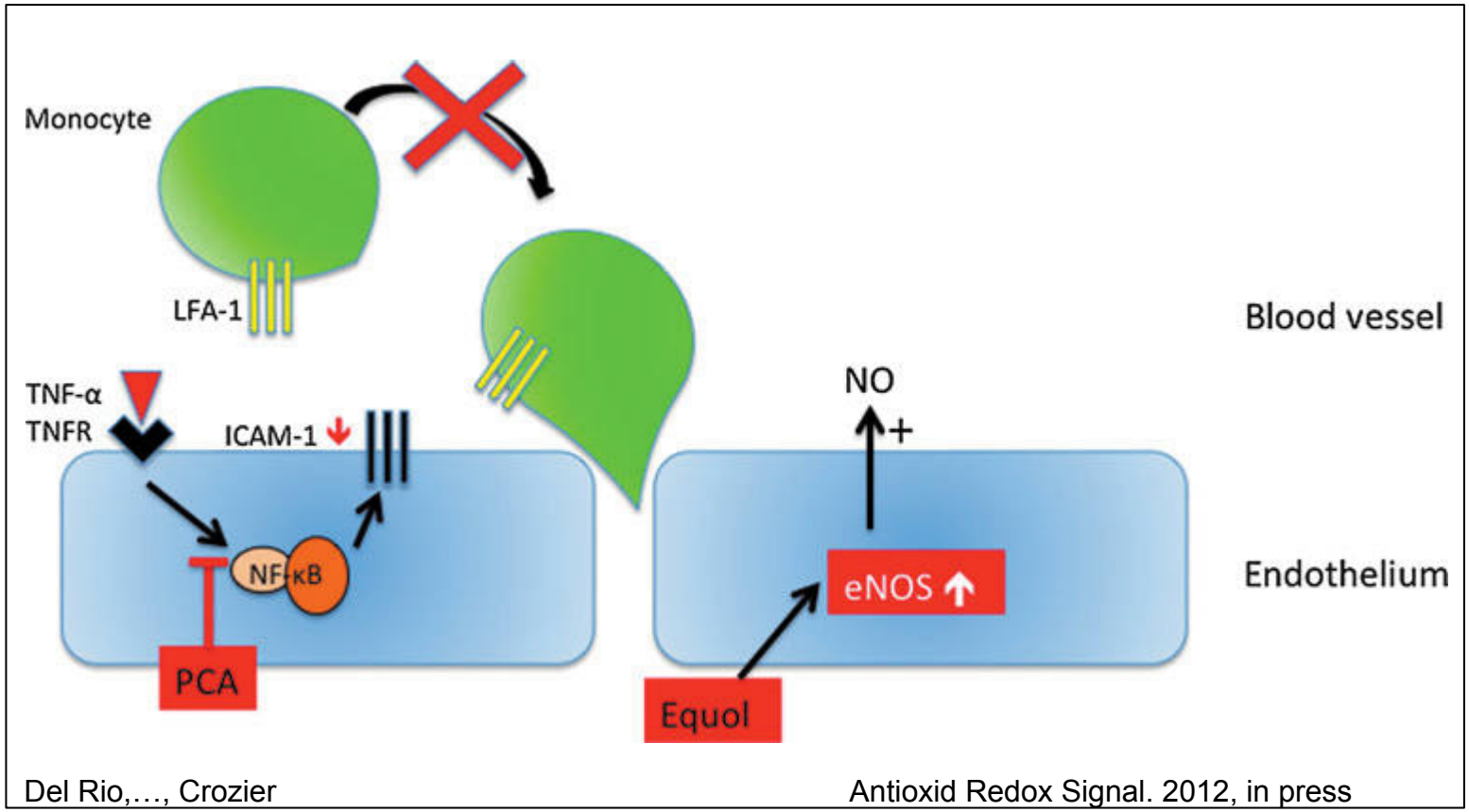
Heiss, Keen, Kelm, Eur Heart J. 2010;31(21):2583-92

Dietary Flavonoids
- Potential Mechanisms (II) -



Heiss, Keen, Kelm, Eur Heart J. 2010;31(21):2583-92

Dietary Flavonoids
- Potential Mechanisms (III) -



Del Rio,…, Crozier

Antioxid Redox Signal. 2012, in press

Scientific Rigor of Flavanol-related Research **in general**, and what **Flaviola** aims for:

Poorly characterized materials

No or insufficient controls

Low-rigor biomedical endpoints & study designs;

Well characterized/ Standardized Materials

Fully matched controls

Relevant Endpoints Double-blind Mechanistic Insight

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