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BIOACTIVE LIPIDS: ENDOCANNABINOIDS AND BEYOND

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The Lipid Connection

SANTA LUCIA NEUROSCIENZE E RIABILITAZIONE

Università di Roma Tor Vergata

UNIVERSITA' CAMPUS BIO-MEDICO DI ROMA

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Istituto di Chimica Biomolecolare

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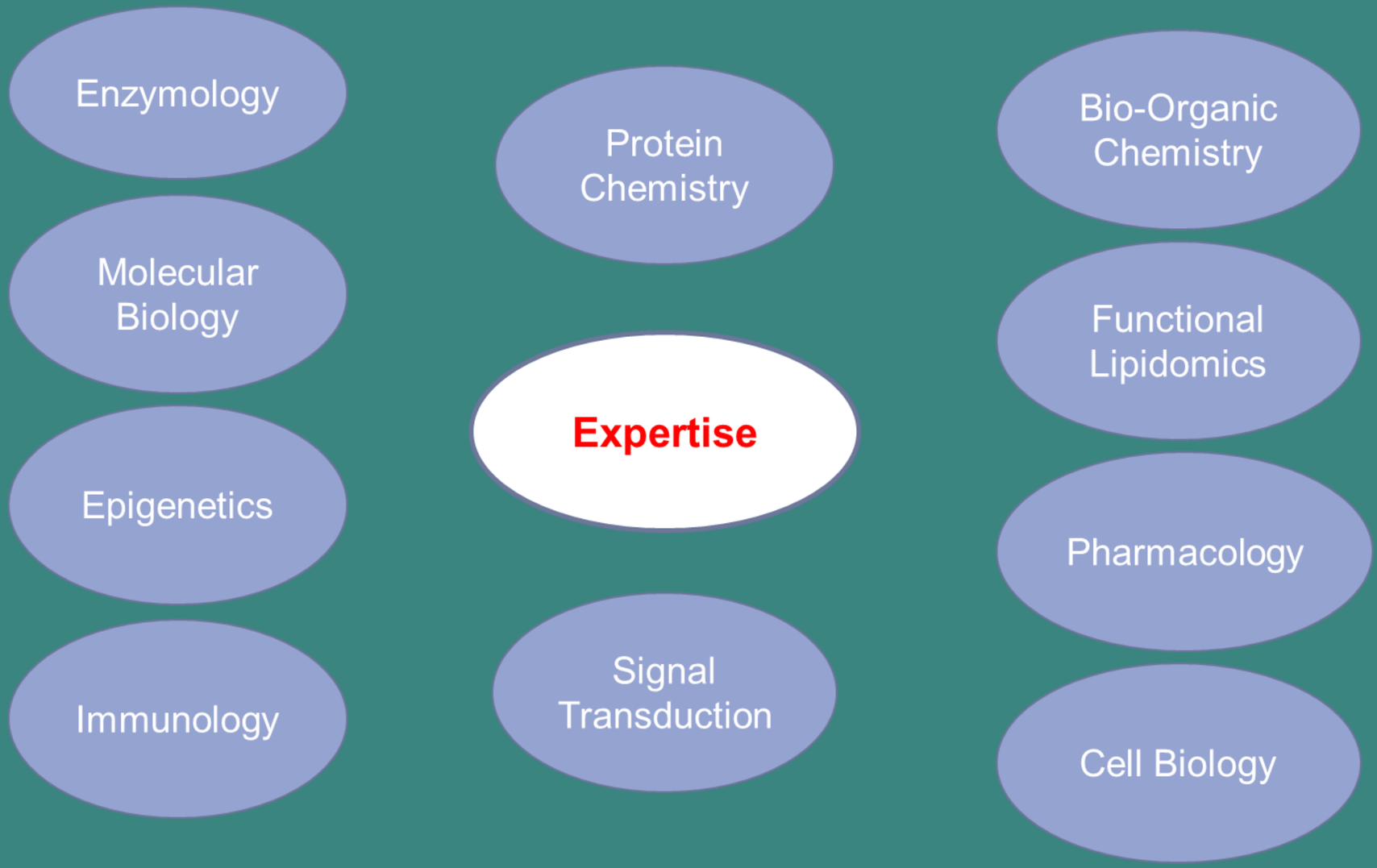
The Lipid Connection



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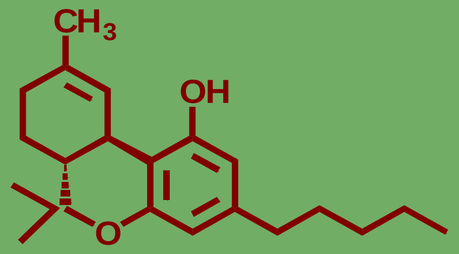
Brief history of (endo)cannabinoids

• 200: The therapeutic properties of cannabis are described in Chinese pharmacopoeia

• 1838-1840: The medicinal properties of cannabis are assessed methodically

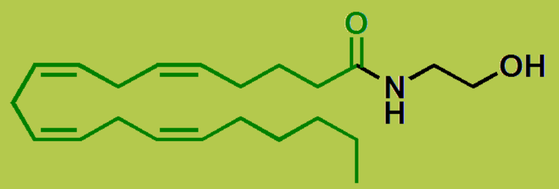
•1964: Gaoni and Mechoulam elucidate the structure of **Δ^9-tetrahydrocannabinol (THC)**



• 1990: Matsuda and colleagues clone the CB_1 receptor

•1992: Mechoulam's group in collaboration with Pertwee's group identifies the first endocannabinoid, *N*-arachidonoylethanolamine or **anandamide (AEA)**

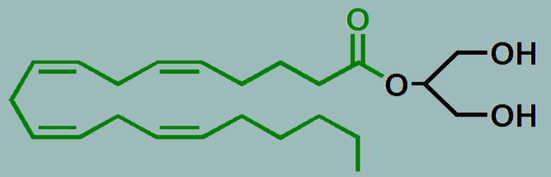
• 1993: Munro and colleagues clone the CB_2 receptor



• 1995: Mechoulam's group and Sugiura's group identify the second endocannabinoid, **2-arachidonoylglycerol (2-AG)**

• 1996: Cravatt and colleagues clone the first endocannabinoid-degrading enzyme, FAAH

• 2003: Bisogno and colleagues clone the first 2-AG-bio-synthesizing enzyme, DAGL



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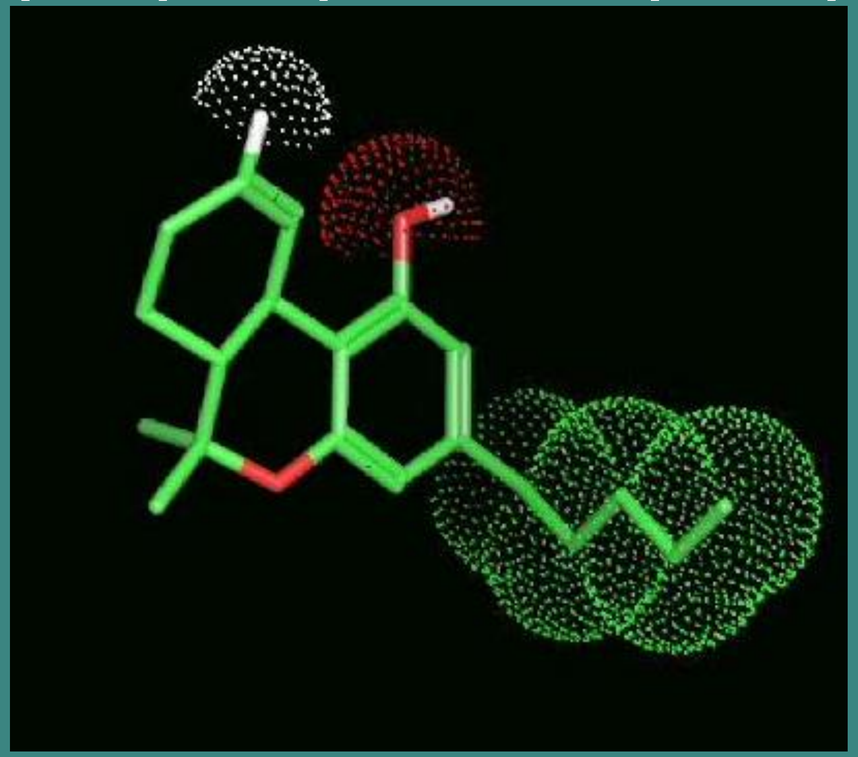
Similarities between:

THC
(a terpeno-phenol compound)



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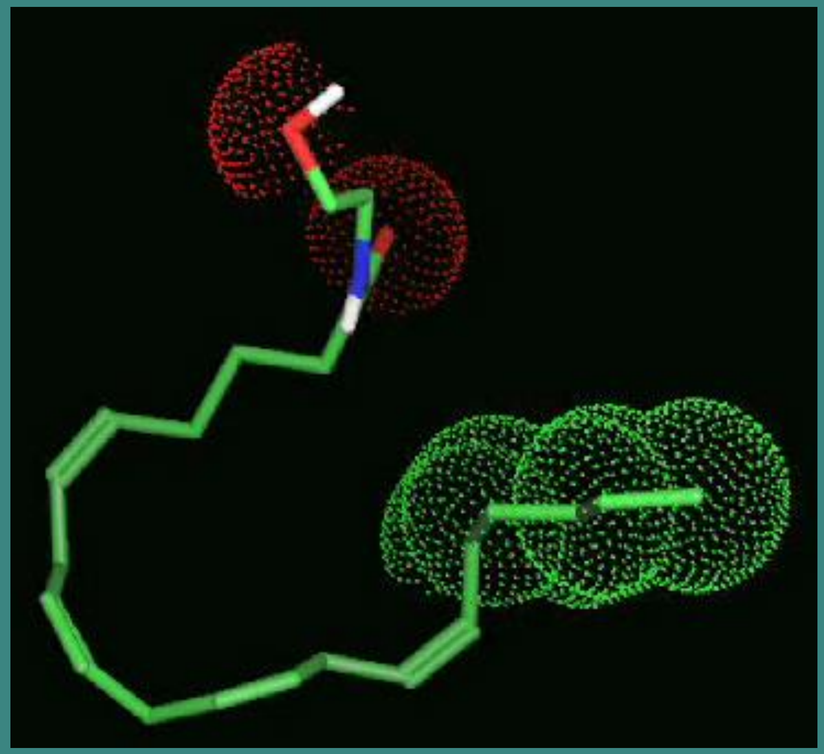

Anandamide
(*N*-arachidonoylethanolamine)

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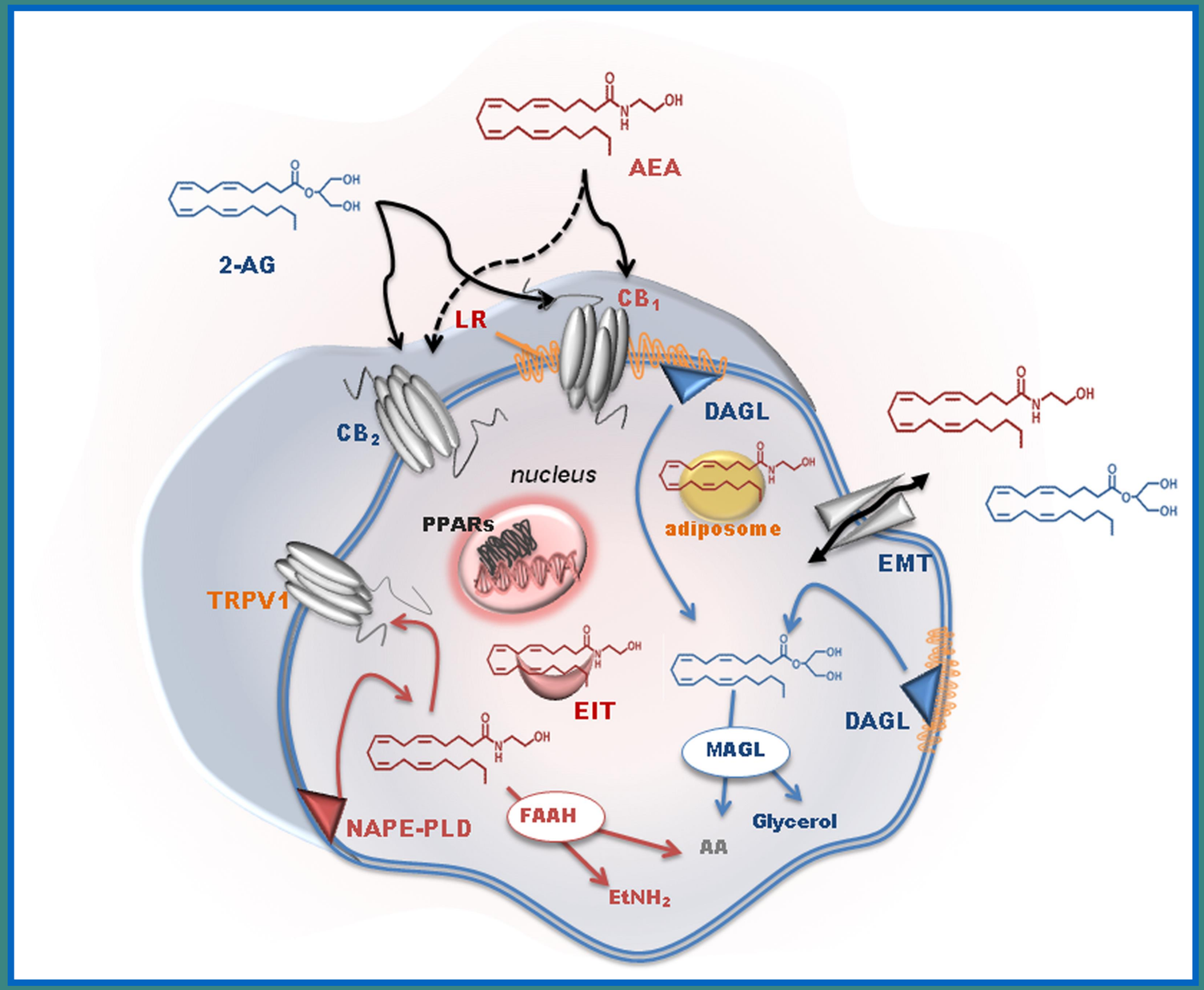
Endocannabinoid system at a glance



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Biological activities of endocannabinoids

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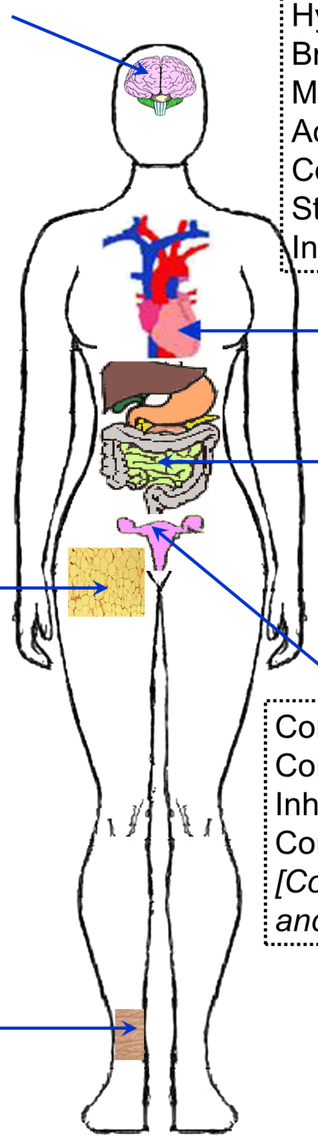
Interference with dopaminergic transmission
Inhibition of GABAergic transmission
Inhibition of glutamatergic transmission
Induction of long term depression
Control of pain initiation
Control of wake/sleep cycles
Control of thermogenesis
Control of appetite
Impairment of working memory
Impairment of memory consolidation
Inhibition of long term potentiation
Control of psychomotor disorders
Control of energy homeostasis

Hypotension
Bradichardia
Modulation of inflammation
Activation of platelet aggregation
Control of cytokine production
Stimulation of haematopoietic stem cell growth
Inhibition of chemotaxis



Inhibition of peristalsis

Regulation of lipid metabolism

Control of folliculogenesis?
Control of oviductal transport
Inhibition of blastocyst implantation
Control of trophoblast differentiation and growth
[Control of spermatogenesis, sperm motility and acrosome reaction in males]

Arrest of keratinocyte differentiation

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SERiSM: Role of the Endocannabinoid System in Reprogramming Human Pluripotent Stem Cells under Microgravity

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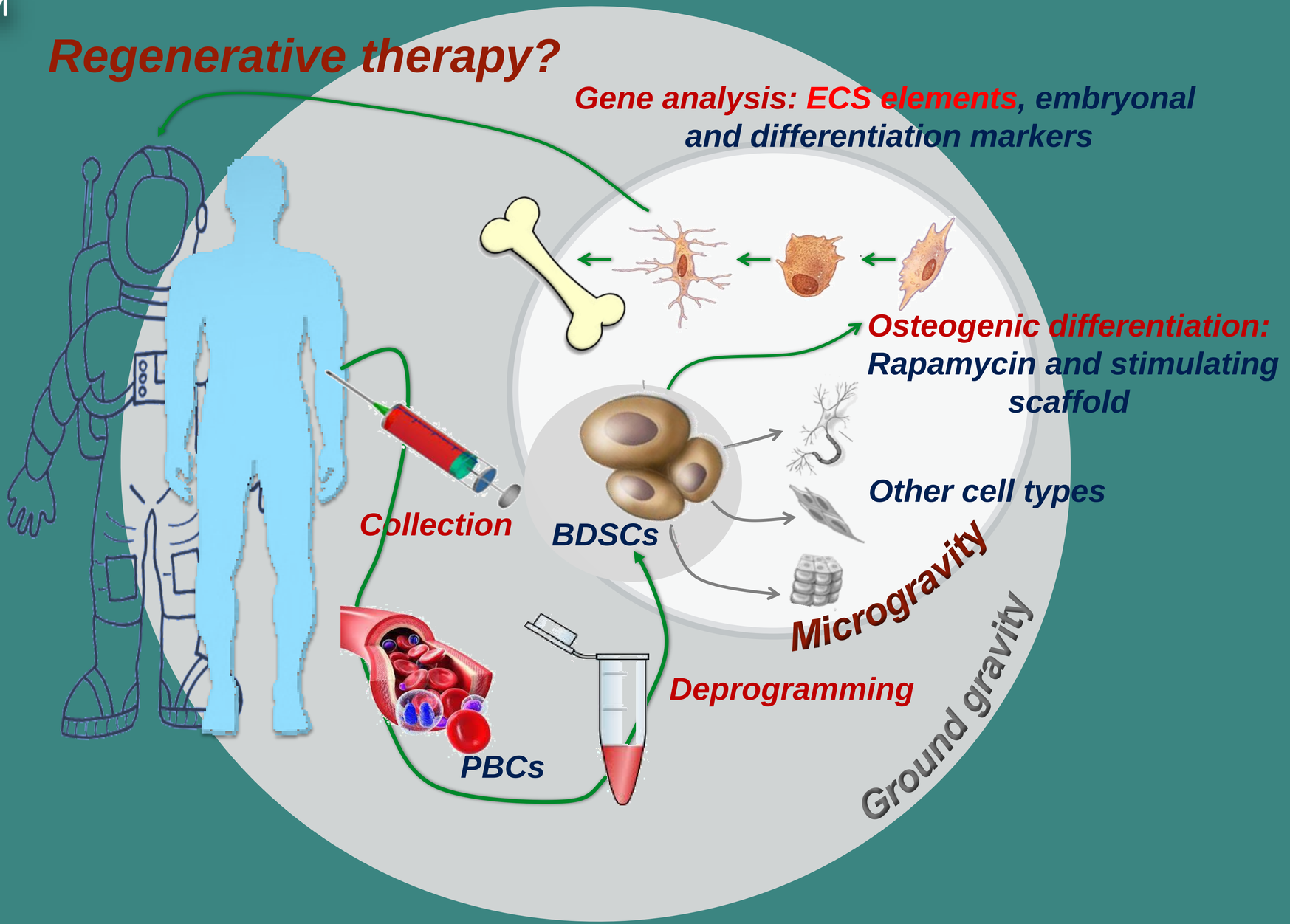

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Back to the International Space Station in August 2017! (*Space Mission Expedition 53*)

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AGENZIA SPAZIALE ITALIANA · NASA/ASI ISS-3 · EUROPEAN SPACE AGENCY ★★★ PAOLO NESPOLI
vita

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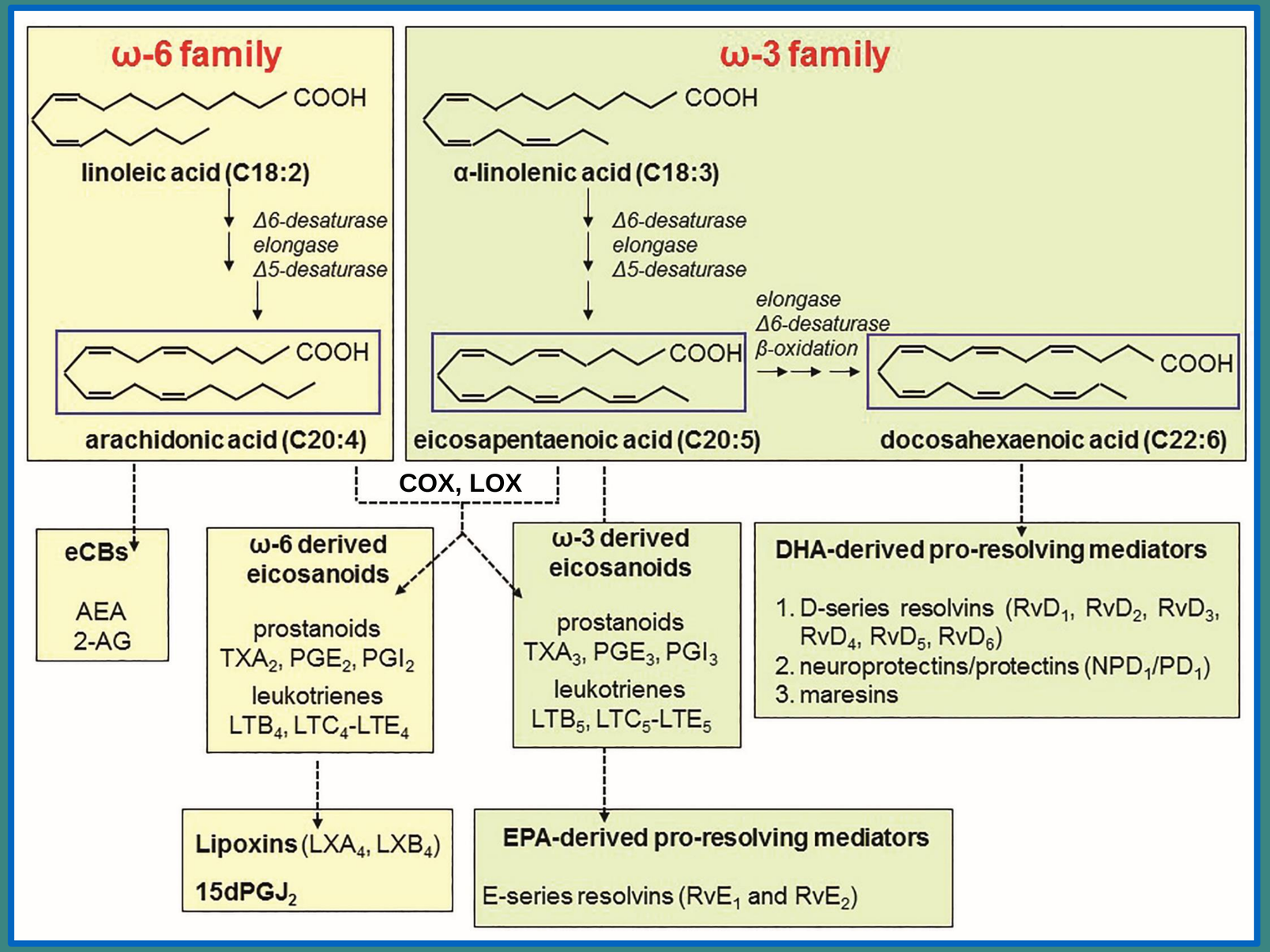
Beyond endocannabinoids: Pro-resolving lipid mediators



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Bioactive lipids and immunity: from cell isolation to immunophenotyping and immune function

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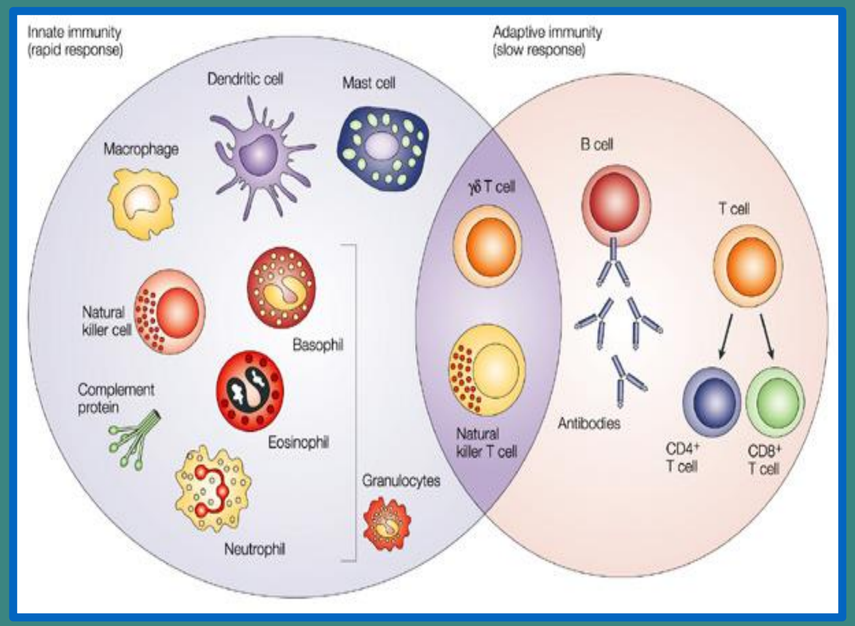

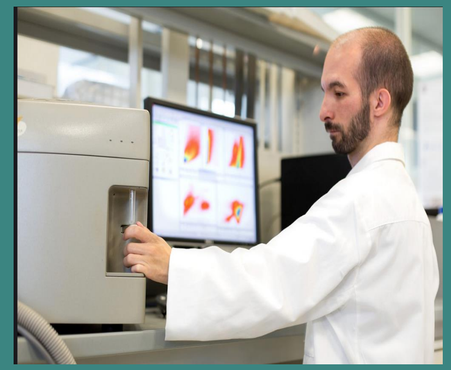

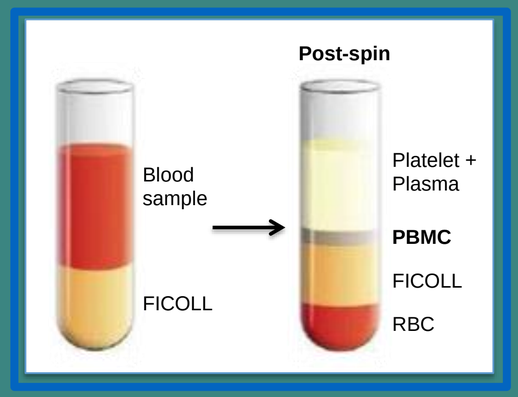

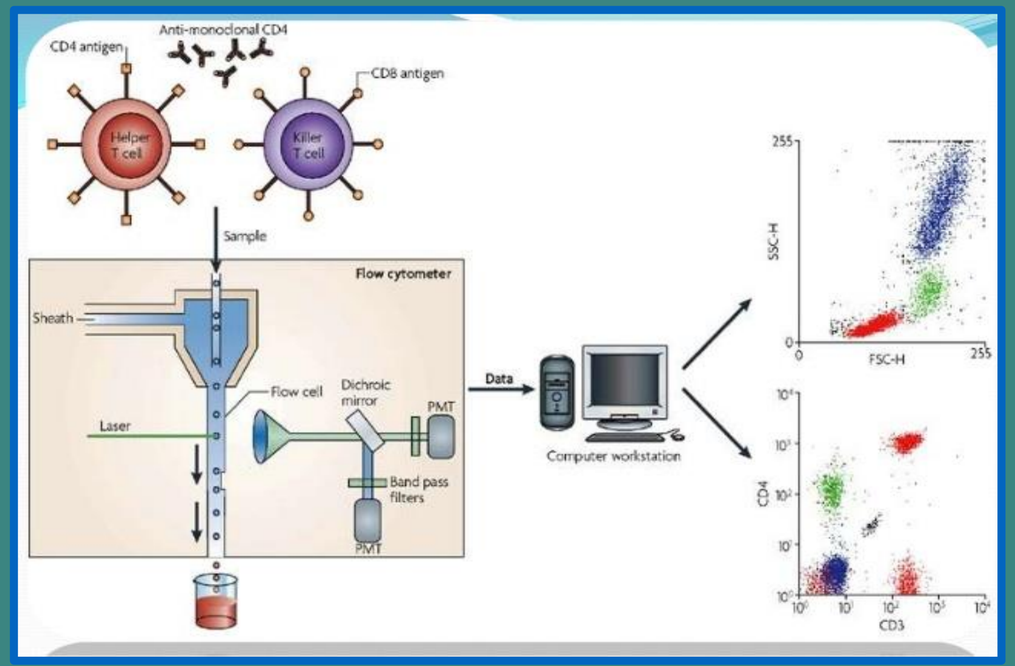

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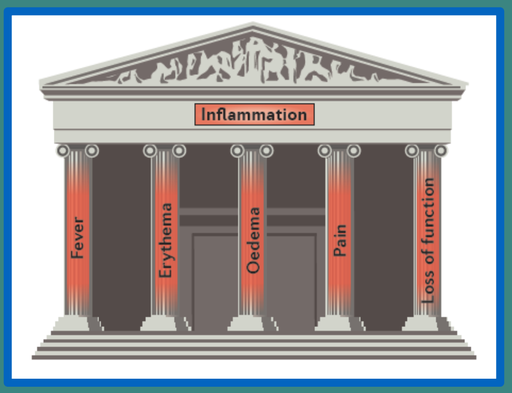

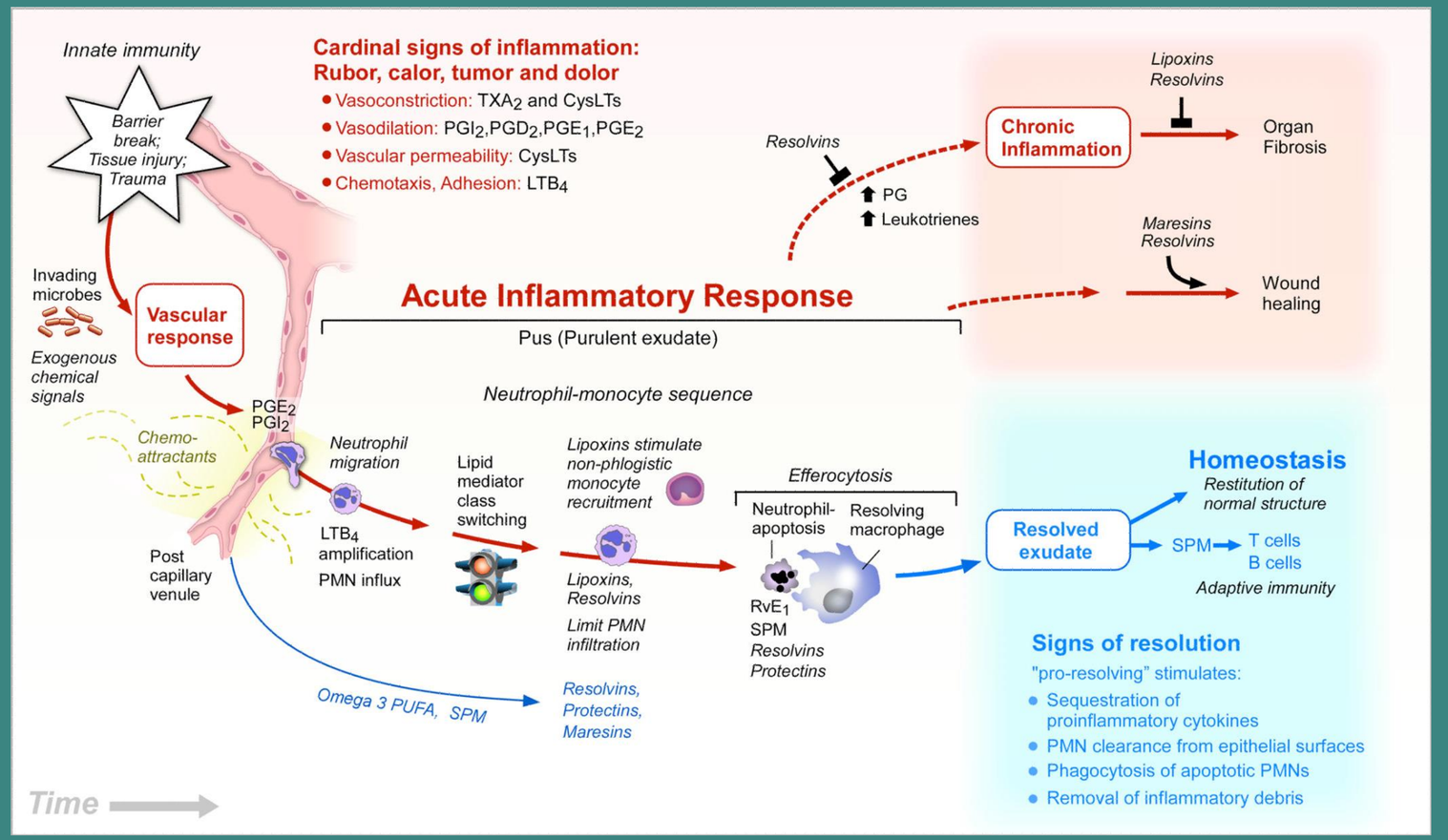

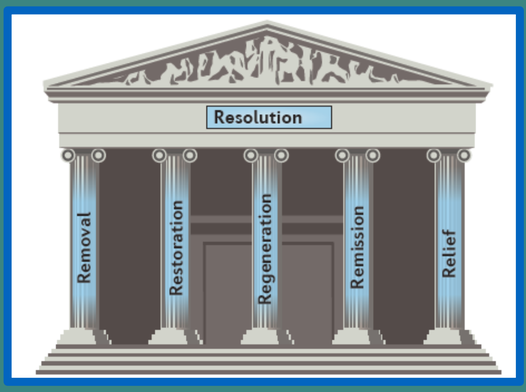

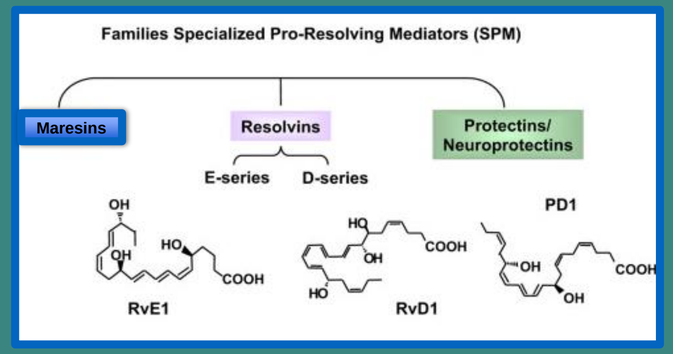

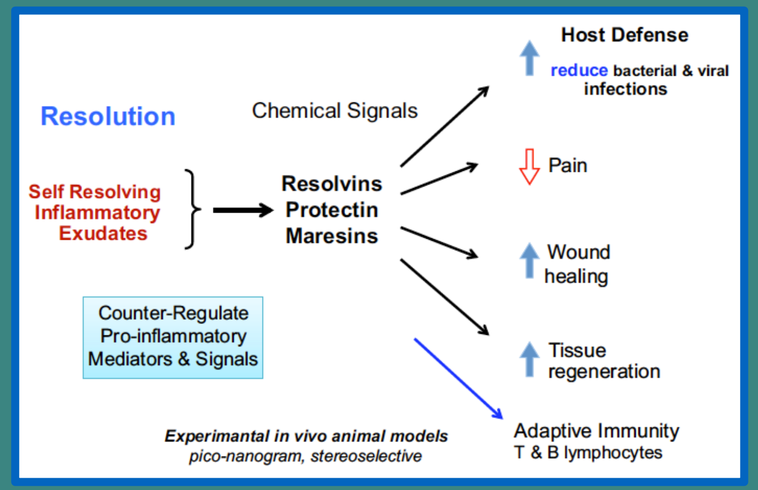

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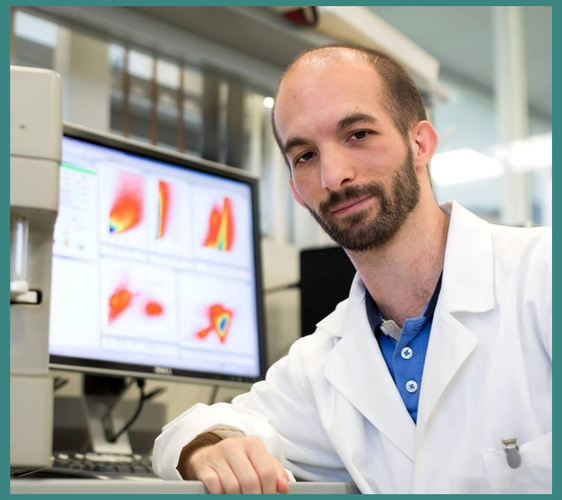
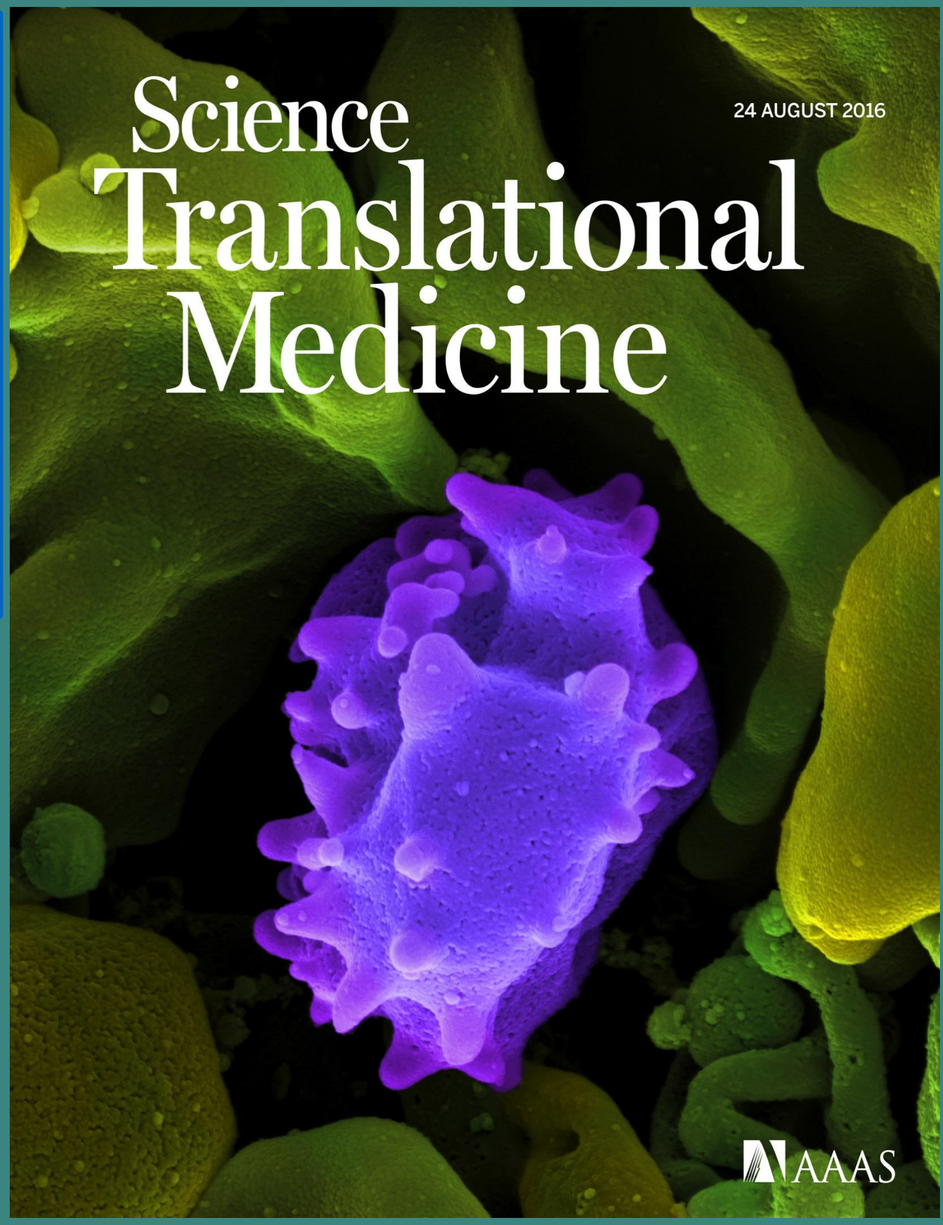
RESEARCH ARTICLE

INFLAMMATION

Proresolving lipid mediators resolvin D1, resolvin D2, and maresin 1 are critical in modulating T cell responses

Valerio Chiurchiù,[1,2]* Alessandro Leuti,[1,2] Jesmond Dalli,[3] Anders Jacobsson,[4] Luca Battistini,[5] Mauro Maccarrone,[1,2†] Charles N. Serhan[3†]* †Equally senior authors





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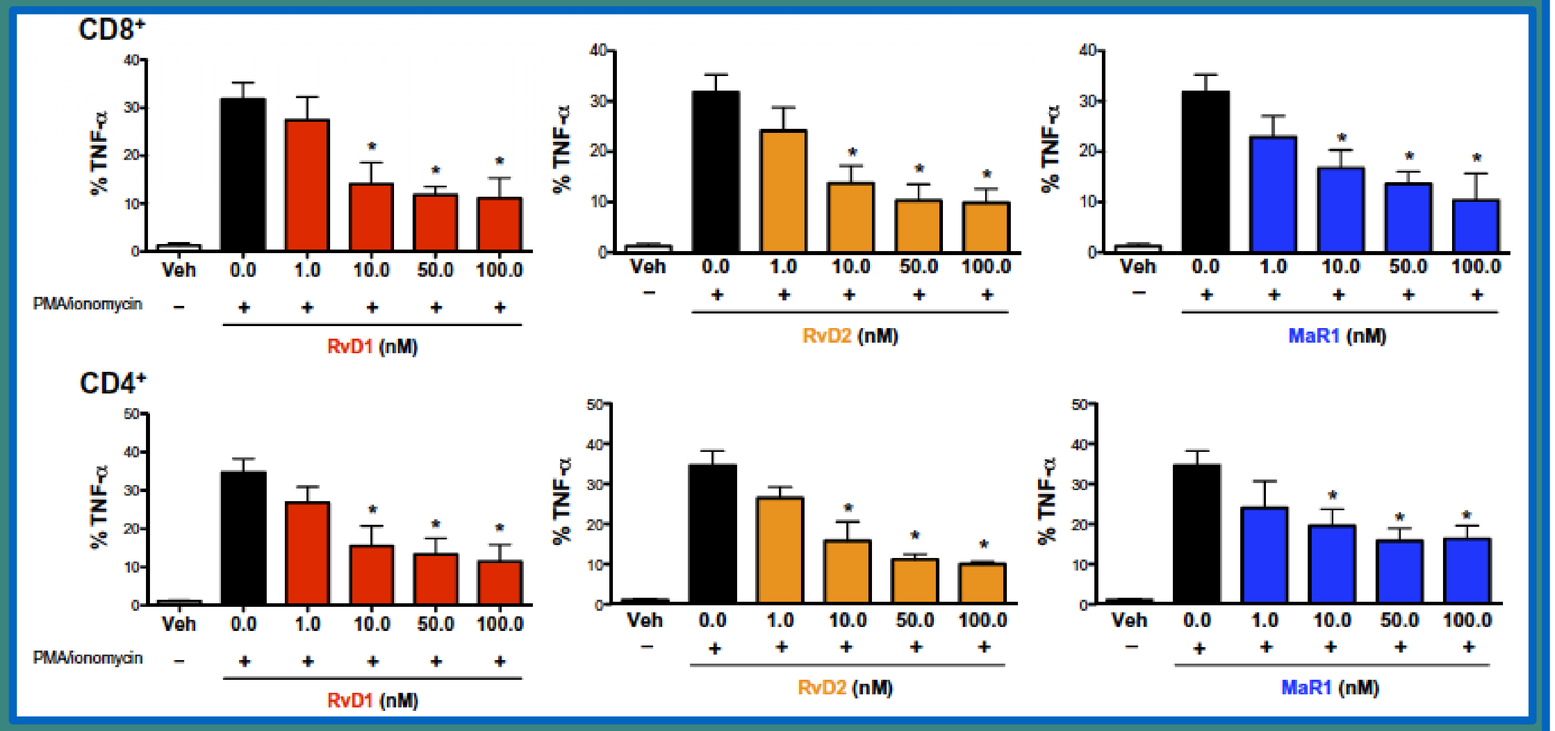

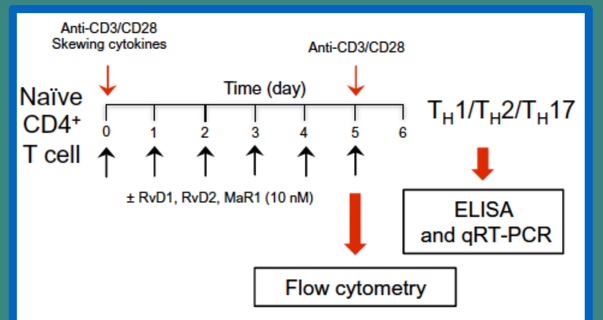

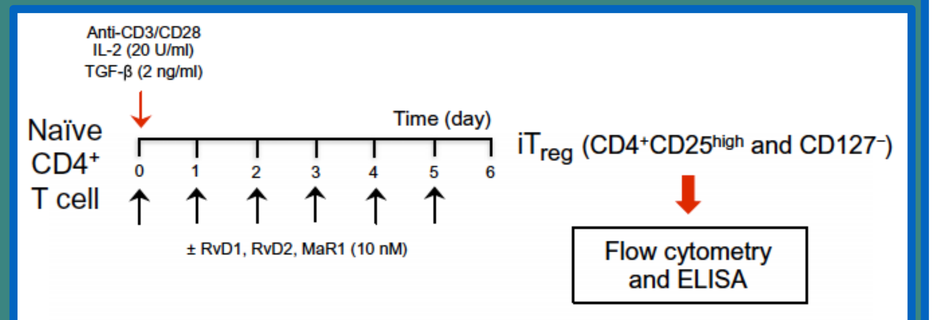

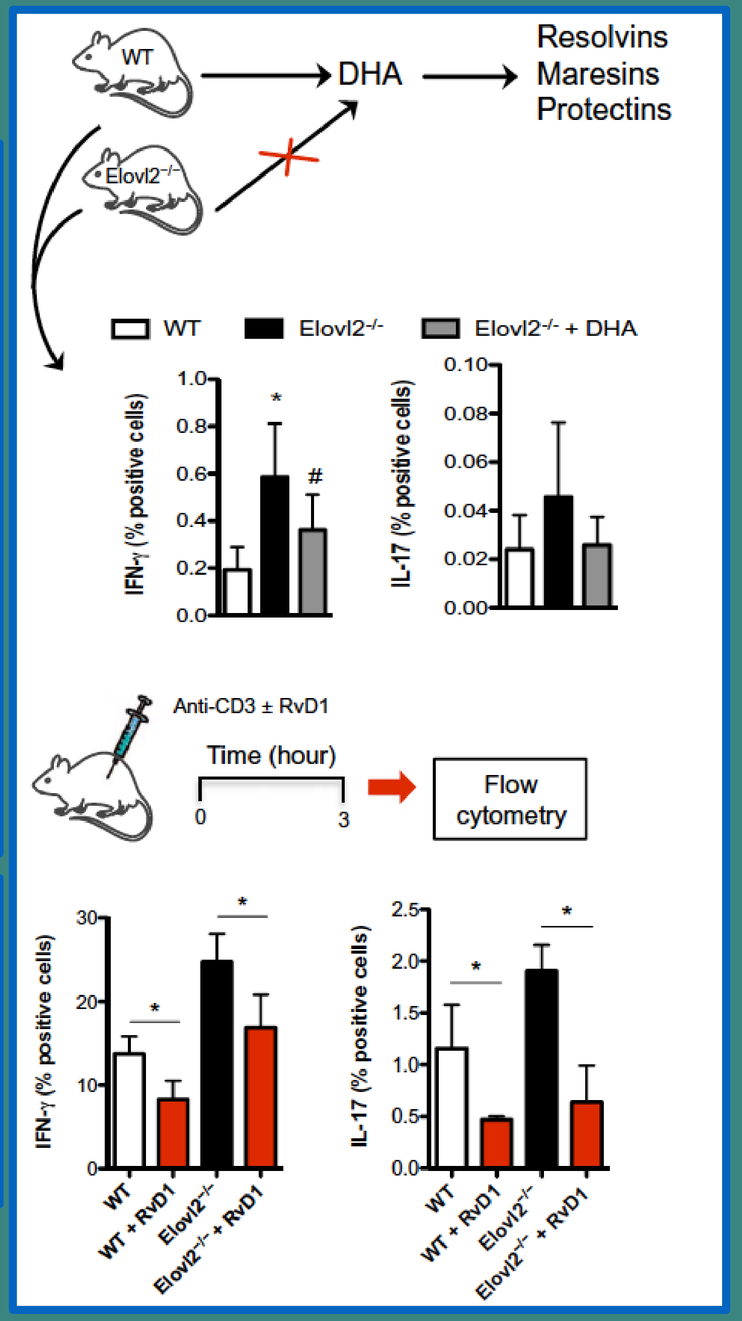

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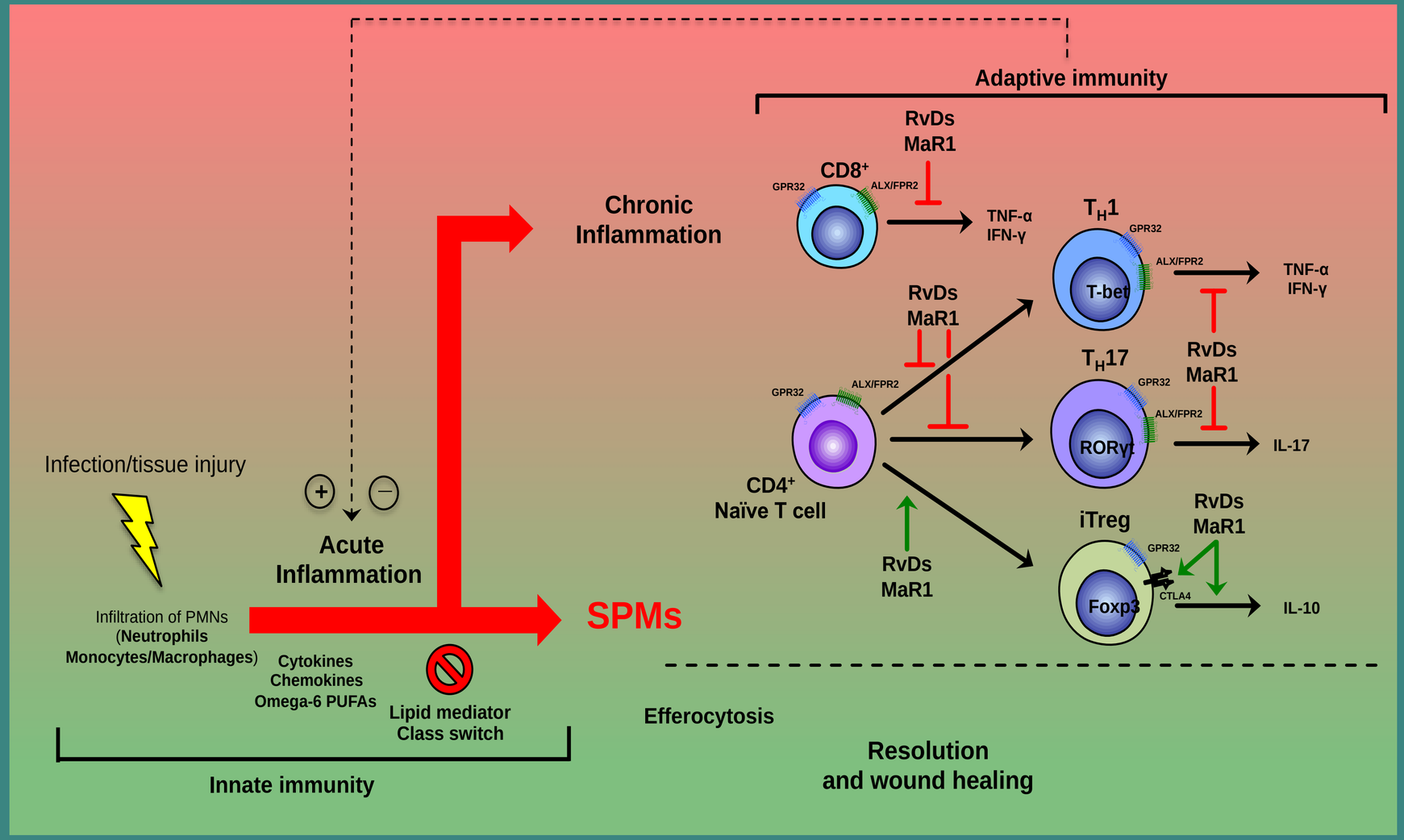

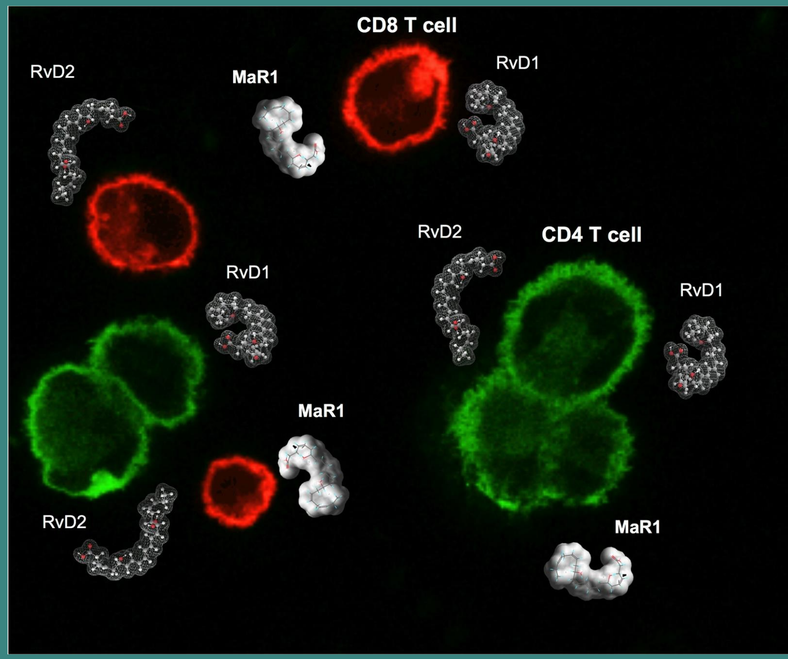

Modified from Chiurchiù et al., Science Transl Med, 2016