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About a Functional Medicine

- **Functional Medicine** is a branch of medicine which bases its clinical method for the **study of physiological processes.**
- It 'a discipline that analyzes the **correlations between physiological response, response and input stressogeno dysfunctional.**

It is said to be more fully **Functional Medicine Regulatory**:

- **Functional** because it allows us to understand the dysfunction of organs and systems before they cause demonstrable harm to specific examinations **(predisease pathways)**
- **Regulatory** occurs because restoring the normal physiological conditions

F.M.R. act as an interface between conventional medicine and complementary medicine natural to combine and/or integrate into a global perspective, structured as transmissible science that allows to integrate medical knowledge (science) with the herbal, homeopathy and nutrition in a unified framework.

Functional medicine embraces the totality of the regulatory capacities of the body:

- biophysical
- biochemical
- enzymatic
- endocrine
- immunological
- bioenergetic

trough the neurovegetative (orthosympathetic/parasympathetic) , metabolic (anabolism/catabolism) and cerebral regulation

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Extra-cellular Matrix

Emerging perspectives of molecular biology and neuroscience converge well with the basic concepts of Functional Medicine Regulatory homeodynamic on the functioning of the body: each district, organ, system, function is interconnected to others and exchange them with continuous biochemical and biophysical information through Extra-cellular matrix

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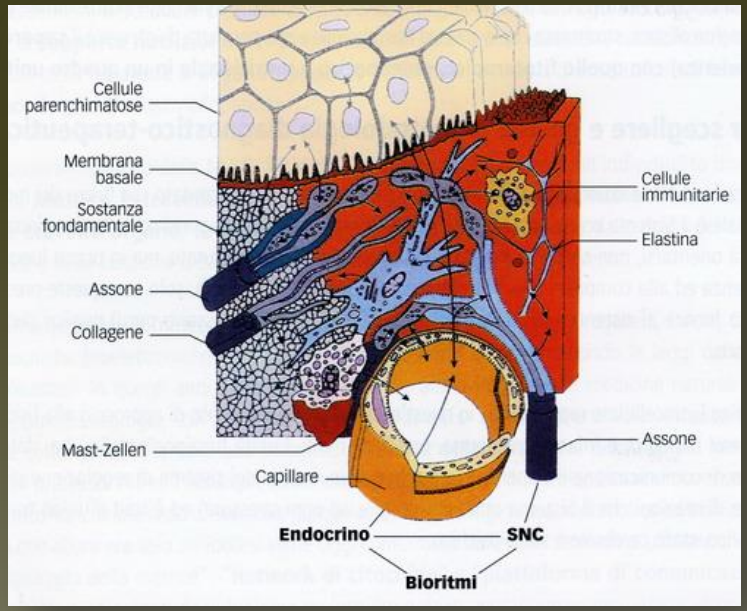
Extra-cellular Matrix: functional unit

An anatomic-functional forum for exchanging and regulating autonomic, metabolic and immune response.



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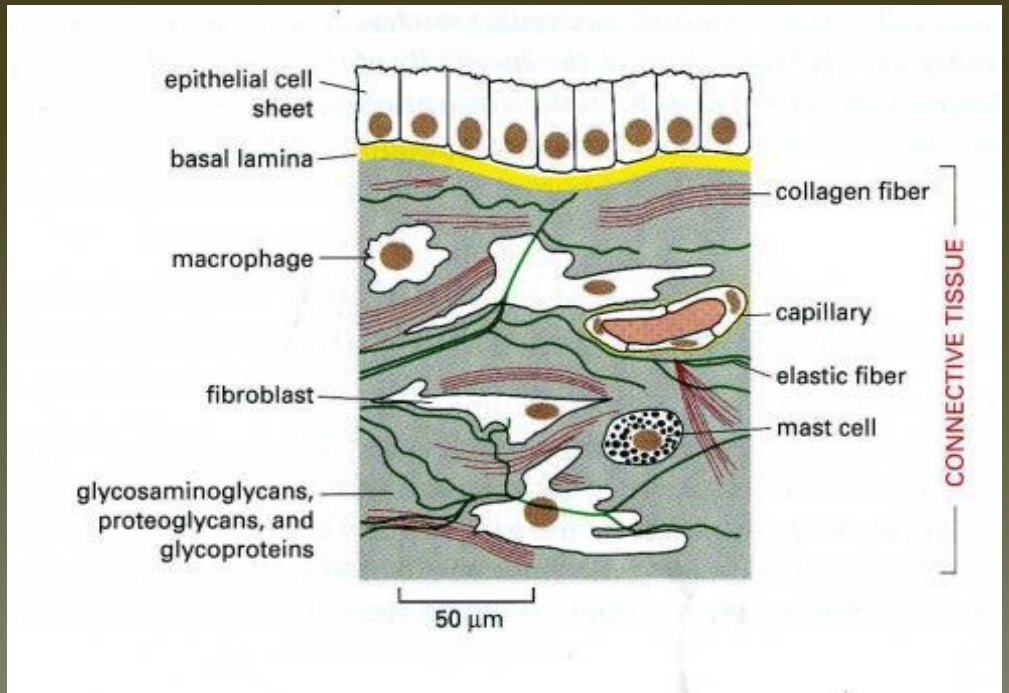
Anatomy of Extracellular Matrix

We can immagine it like a three-dimensional network formed by big glyco proteic polymers :



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Composition of Extracellular Matrix: functional unit

Structure/Anatomy	Functional component
Proteoglycans › GAGs + proteins Proteins › Structural (collagen, elastin) › Adesive (fibronectin, laminin ecc.) Basal lamina Intrafibrillar water	Cells Assons Capillars Linfatic

«Languages» of Extra-cellular Matrix

- Citochine and growth factors
- Nervous impulses and nerve pathways
- Electrochemical synapses
- Electromagnetic impulses

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Matrice extracellulare del miocardio

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association®

Association Between Extracellular Matrix Expansion Quantified by Cardiovascular Magnetic Resonance and Short-Term Mortality

Timothy C. Wong, Kayla Piehler, Christopher G. Meier, Stephen M. Testa, Amanda M. Klock, Ali A. Aneizi, Jonathan Shakesprere, Peter Kellman, Sanjeev G. Shroff, David S. Schwartzman, Suresh R. Mulukutla, Marc A. Simon and Erik B. Schelbert

Circulation. 2012;126:1206-1216; originally published online July 31, 2012;

- 793 patients
- Magnetic resonance with gadolinium to access a volume of extracellular myocardial matrix
- Increase of volume ECM is associated with increased risk of: death, cardiac transplantation and need of mechanical cardiac assistance

Wong. Circulation 2012; 126: 1206-1216

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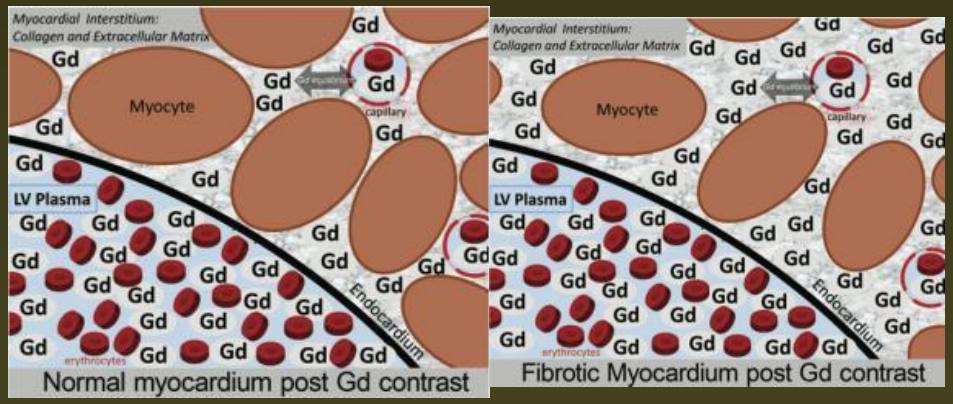
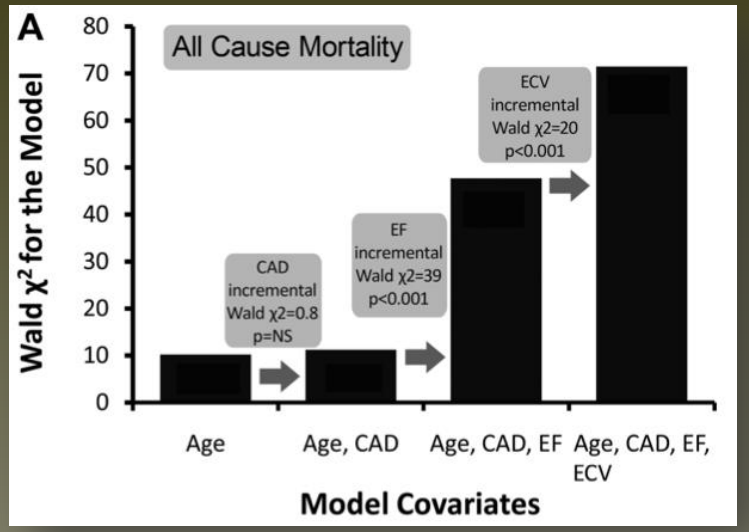
Expansion of ECM and all Cause Mortality



Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION



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Multiple Roles of the Extracellular Matrix in Inflammation:

- provides specific molecular and spatial information that influences cell proliferation, differentiation and apoptosis
- directly influence leukocyte recruitment to the inflammed tissue by providing differential signals resulting from its spatial and molecular composition, or indirectly by its potential to bind and present cytokines or chemotactic factors
- mediates inflammation-induced angiogenesis and the subsequent remodelling steps
- provides specific mechanical forces, exposes cryptic adhesion sites, and releases biologically active fragments (matrikines) and matrix-sequestered growth factors

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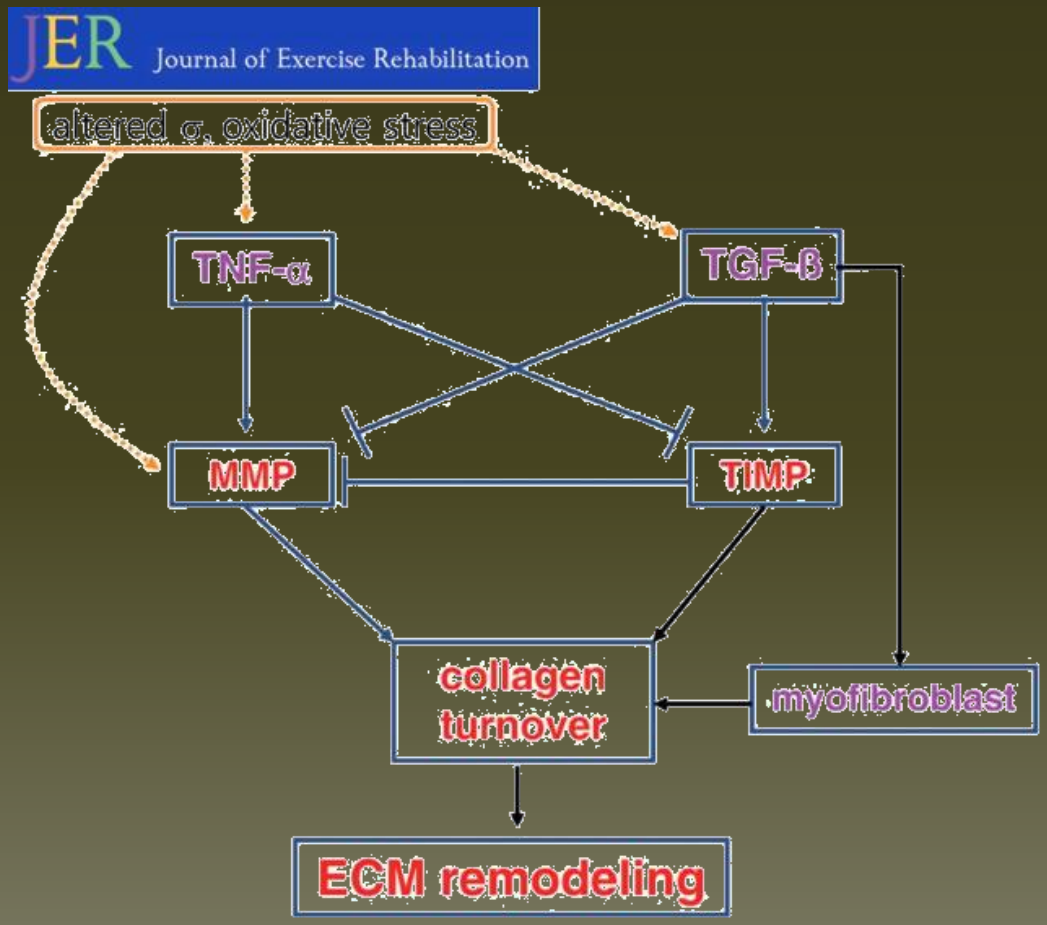
Rimodelling of ECM



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JER

Review Article

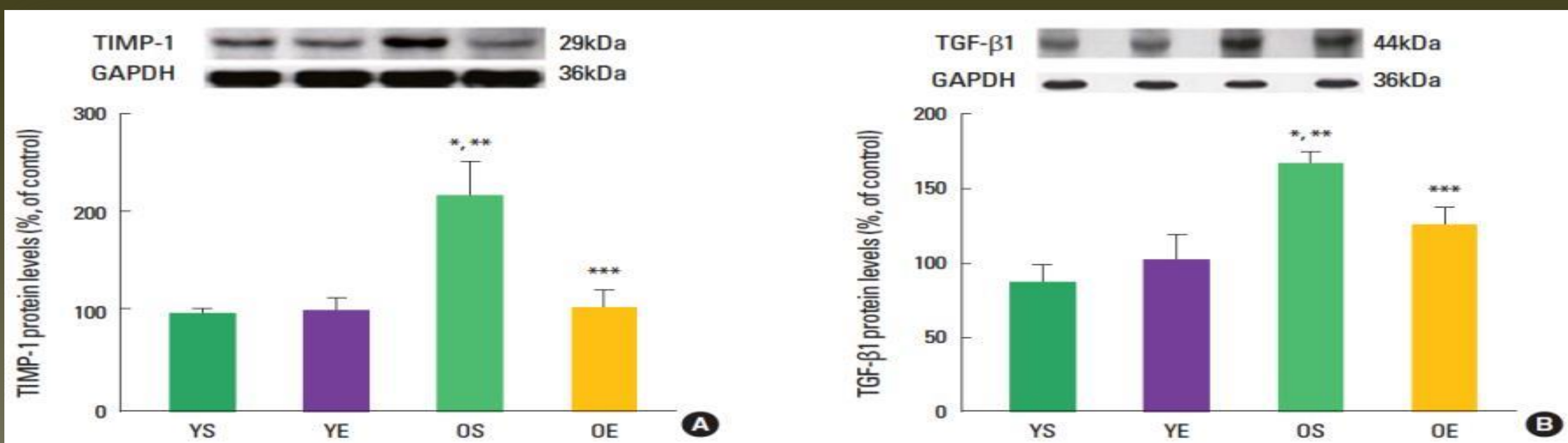
http://dx.doi.org/10.12965/jer.130043

Journal of Exercise Rehabilitation 2013;9(3):338-347

Aging, exercise, and extracellular matrix in the heart

Hyo-Bum Kwak*

Department of Kinesiology, Inha University, Incheon, Korea



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Acidosis

- Extreme systemic acidosis is incompatible with life.
- Functional Medicine focuses at a slight acidic tilt, what brings serious health consequences.
- Moderate, non-life threatening acidosis, results in sub-optimal functioning of uncounted cells, tissues, and organs. To survive, the body must excrete and/or neutralize excess acids regaining a life-supporting acid-base balance.

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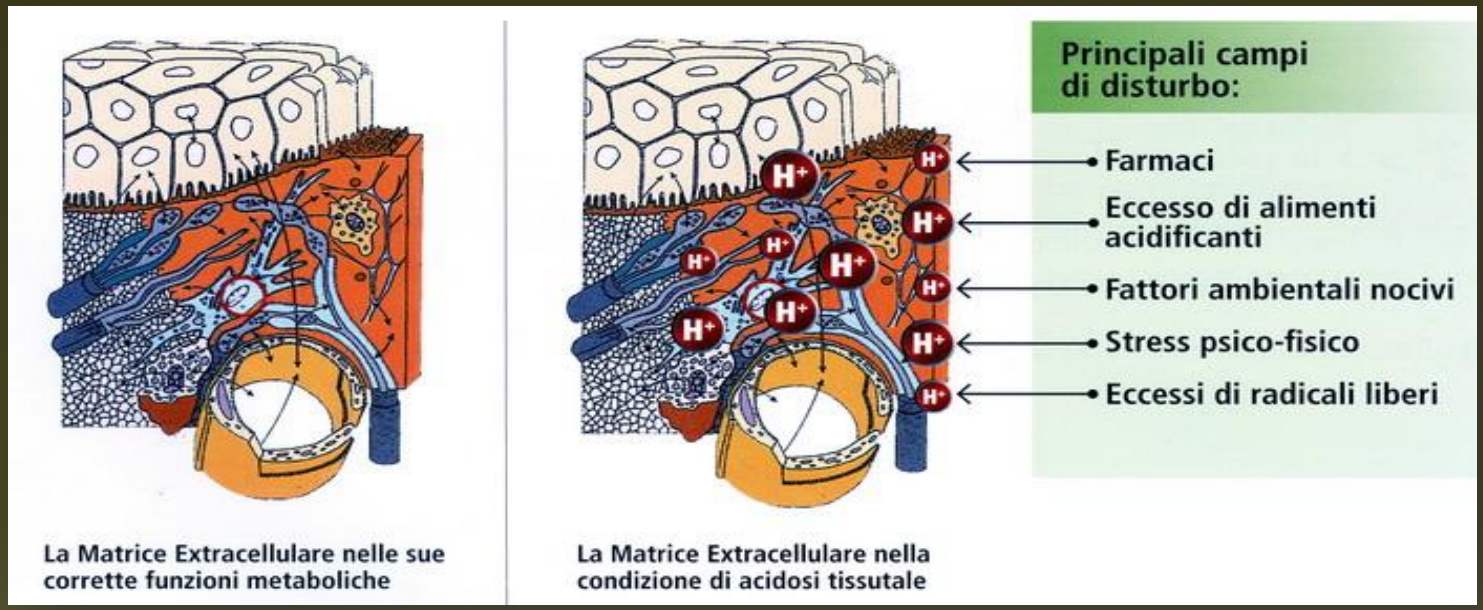
Acidosis and Extracellular Matrix



- Matrix with acid pH loss his capacity to compensate
- From Sol to Gel
- Loss of basic substances (Ca, K, Mg, Na)

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Consequences of low grade metabolic acidosis 1

- Loss of calcium in the urine with ospetopenia and osteoporosis
- Loss of potassium and magnesium stores from the body , resulting in a tendency towards hypertension and inflammation and pain
- Increased levels of blood parathyroid hormone (PTH)
- Protein catabolism and depressed protein metabolism, resulting in a muscle wasting and increased age-related muscle loss
- Suppression of growth hormone, insulin-like growth factor, and other pituitary hormones
- Accelerated aging from accumulated acid waste products,
- Increased production of free radicals—unstable molecules that cause cellular damage, resulting in the worsening of pain and inflammation, and the lowering of immune capacity, increasing risk of degenerative disease and premature aging

Consequences of low grade metabolic acidosis 2

- Tendency for connective tissue to weaken due to increased free radicals
- Excessive acid has actually been found to be stored within the connective tissue.
- Decreased efficiency of cellular ATP energy production, causing impaired cellular function and, eventually, impaired organ function
- Increased fluid retention, resulting in the excessive accumulation of fluids within body tissues
- Disrupted balance of intestinal bacteria
- Encouragement of the growth and spread of yeast and fungi, these potential pathogens thrive in an acid terrain

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Consequences of low grade metabolic acidosis 3

- Creation of a more fertile breeding ground for many viruses, including HIV: viruses thrive in an acidic, low-antioxidant environment
- Reduced size of the brain's pool of energy reservesm, weakened mental capacity
- Decreased ability to perform exercise at a high level of intensity: acidity creates a low-oxygen environment that is worsened by exercise
- Increased acidity of the mouth, leading to imbalanced oral bacteria and, consequently, increased dental decay and periodontal (gum) disease.
- Creation of a mild form of hypothyroidism (low thyroid function) and a chronic overproduction of the stress hormone cortisol
- Development of low blood phosphorus levels

Therapeutic goals of M.F.R.

- Detoxification and drainage of **Extra-cellular matrix**
- Maintenance of **Metabolic balance (acid/basic)**
- Restoring of **Intestinal Eubiosis**
- Prevention of **Oxidative Stress**
- Evaluation of **correlation between Psyche/Brain/Organon (PNEI)**
- Decrease stress (mindfulness, yoga, breathing techniques ecc.)

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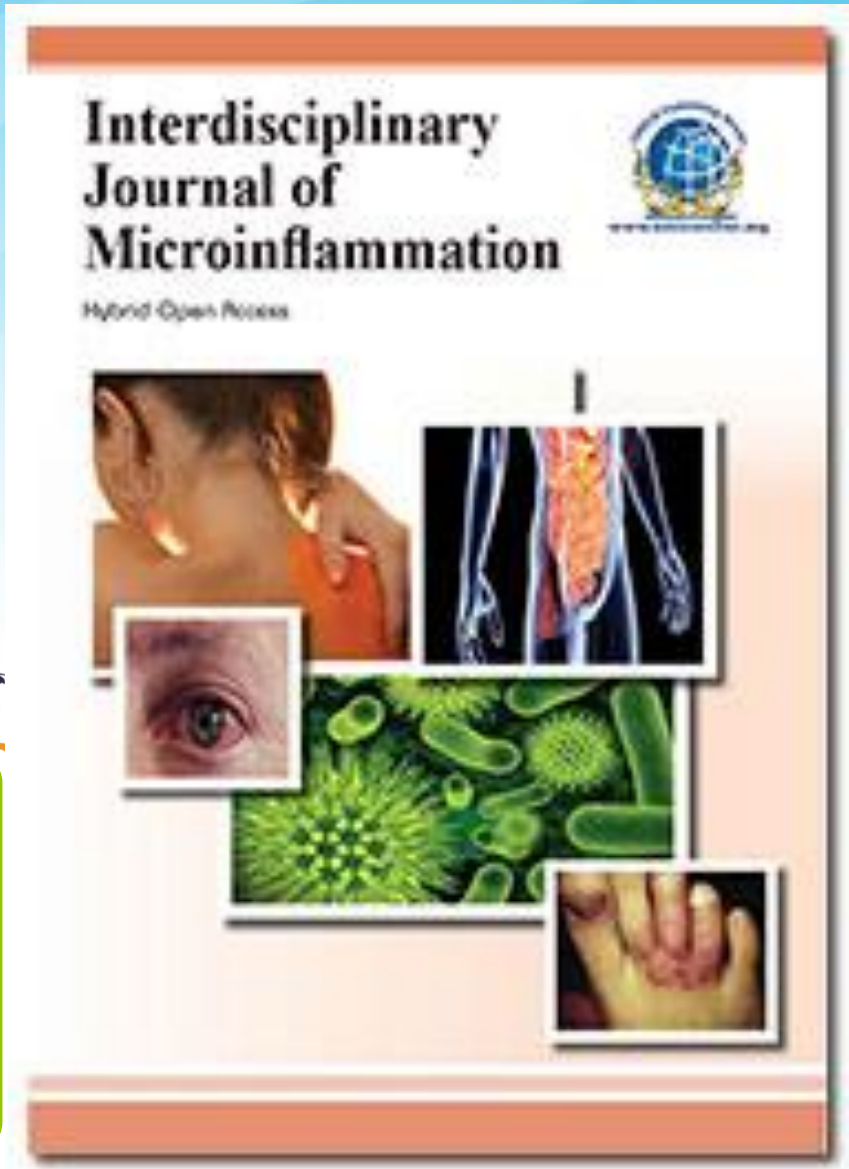

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- Allergy & Therapy
- Medical Microbiology & Diagnosis

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Review in 3 weeks Publishing in 72 hours Open Access

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3rd International Conference on Clinical Microbiology & Microbial Genomics

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