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5th International Congress on Allergy and Clinical Immunology

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E Poster

35 YEARS OF EXCELLENCE IN MEDICAL PUBLISHING

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Soluble Urokinase Receptor as a promising marker for early prediction of outcome in COVID-19 hospitalized patients

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The Coronavirus disease 2019 (COVID-19), caused by SARS-CoV-2, has rapidly spread to become a global pandemic, putting a strain on health care systems. SARS-CoV-2 infection may be associated with mild symptoms or, in severe cases, lead patients to intensive care unit (ICU) or death. The critically ill patients suffer from acute respiratory distress syndrome (ARDS), sepsis, thrombotic complications and multiple organ failure. For optimization of hospital resources, several molecular markers have been evaluated in order to stratify COVID-19 patients, based on the risk of developing a mild or severe disease.

More recently, soluble urokinase receptor (suPAR) has attracted scientific interest because it seems to discriminate better than some other biomarkers among patients with different severities of illness. We investigated the newly introduced inflammatory marker suPAR in hospitalized patients affected by different forms of COVID-19, from mild to severe disease or death. In a wide population of acute medical patients, suPAR is strongly associated with disease severity and mortality, suggesting that suPAR could be used in the clinic as a prognostic indicator.

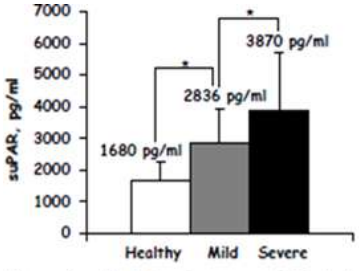

Figure 1. Analysis of serum suPAR levels in COVID-19 hospitalized patients during Italian second wave. Serum suPAR levels in healthy controls (white column), mild cases (grey column) and severe cases of COVID-19 (black column); *p < 0.05.

Recent Publications

1. D'Alonzo, D.; De Fenza, M.; Pavone, V. COVID-19 and pneumonia: a role for the uPA/uPAR system. Drug Discov Today 2020, 25, 1528-1534.

2. Rovina, N.; Akinosoglou, K.; Eugen-Olsen, J.; Hayek, S.; Reiser, J.; GiamarellosBourboulis, E.J. Soluble urokinase plasminogen activator receptor (suPAR) as an early predictor of severe respiratory failure in patients with COVID-19 pneumonia. Crit Care 2020, 24, 187.

3. Chalkias, A.; Mouzarou, A.; Samara, E.; Xanthos, T.; Ischaki, E., Pantazopoulos, I. Soluble Urokinase Plasminogen Activator Receptor: A Biomarker for Predicting Complications and Critical Care Admission of COVID-19 Patients. Mol Diagn Ther

Biography

Filomena Napolitano was born on August 25, 1988, in Avellino, Italy. She graduated in Pharmaceuticals Biotechnology in 2013 at the University of Naples Federico II, Italy; in 2017 she obtained a PhD in Experimental and Clinical Medicine, at the University of Naples Federico II, Italy. In 2021, she became Specialist in Clinical Pathology and Clinical Biochemistry, University of Naples Federico II, Italy. Actually, she is postdoctoral fellow at School of Medicine and Surgery, University of Naples Federico II. She has her expertise in the study of the expression and functions of the urokinase receptor (uPAR) and FPRs, a class of innate immunity receptors, in tumor cells and inflammatory cells, being interested in the identification of new inhibitors with anti-cancer activity.

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Accepted Abstracts

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Experimental models for production of immune molecules by non-immune cells

Iskra Sainova
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A possibility about production of membrane receptor glycoproteins by non-immune cellular types was proposed. It could be underlined by initial immune differentiation of stem and progenitor cells in the presence of malignant cells or antigens, of viruses and/or viral antigens, as well as of appropriate immunomodulators. Signs of initial myeloid and lymphoid differentiation of non-transfected and non-containing additional gene copy mouse embryonic stem cells (mESCs), co-cultivated with the transfected mESCs, containing additional oncohgene copy, and of further macrophage and plasmatic cells differentiation – in cocultivation with malignant human cervical carcinoma HeLa cells, respectively. Analogical signs were observed in 3T3 mouse embryonic fibroblasts, pre-incubated cultural fluid from previously incubated in it mouse malignant myeloma cells, but also in inoculated with vaccine avipoxviral strains (Poxviridae family), freezed at −800C in the presence of Dimethylsulfoxide (DMSO), thawed and re-incubated embryonic mammalian cells. Furthermore, a possibility about transfer of nucleotide fragments between cellular and viral genome, but also in the opposite direction (from viral to cellular genome) as a result of activation fusion processes on the influence of DMSO and of the drastic temperature changes, was proposed. Analogically, production of immunoglobulins/antibodies by non-lymphoid cells, tissues and organs in such conditions was also suggested. Because the so produced antibodies are out of the germinative centers of the specialized lymphoid tissues and organs, the control in their function is very important for escape of malignant transformation or of degenerative changes. In this direction essential is the role of the small ions and molecules, by influence of various intra- and extra-cellular inter-molecular interactions.

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Familial Clustering of Juvenile Psoriatic Arthritis associated with a hemizygous FOXP3 mutation

Raed Alzyoud
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Purpose of Review: We describe the clinical and genetic findings in four patients from a single family who presented withrefractory psoriatic arthritis and were hemizygous in the forkhead box protein 3 (FOXP3) gene (c.1222G>A).

Recent Findings: We report four siblings with hemizygous mutation in the FOXP3 gene (c.1222G>A) who presented with type 1 diabetes mellitus and psoriatic arthritis poorly responsive to treatment. Our findings expand the phenotype spectrum of F OXP3 mutations.

Summary: Immune dysregulation, polyendocrinopathy, and enteropathy, X-linked (IPEX) syndrome is a rare disorder caused by mutations in FOXP3 gene, which lead to early onset of constellation of autoimmune manifestations. This report highlights the influence of immune dysregulation in juvenile arthritis.

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TGF-Beta in Chagas disease development: Molecular insights, antifibrotic effects and, clinical utility

Roberto Ferreira
Oswaldo Cruz Foundation (Fiocruz), Brazil

The anti-inflammatory cytokine transforming growth factor beta (TGF-β) plays an important role in Chagas disease (CD), a potentially life-threatening illness caused by Trypanosoma cruzi. In this lecture Roberto Ferreira will revisit the clinical studies in CD patients combined with in vitro and in vivo experiments, presenting three main sections: an overview of epidemiological, economic, and clinical aspects of CD and the need for new biomarkers and treatment; a brief panorama of TGF-β roles and its intracellular signaling pathways, and an update of what is known about TGF-β and CD. In in vitro assays, TGF-β increases during T. cruzi infection and modulates heart cells invasion by the parasite fostering its intracellular parasite cycle. TGF-β modulates host immune response and inflammation, increases heart fibrosis, stimulates remodeling, and slows heart conduction via gap junction modulation. TGF-β signaling inhibitors reverts these effects opening a promising therapeutic approach in pre-clinical studies. CD patients with higher TGF-β1 serum level show a worse clinical outcome, implicating a predictive value of serum TGF-β as a surrogate biomarker of clinical relevance. TGF-β polymorphisms indicate that CD immunogenetics is at the base of this phenomenon. Moreover, pre-clinical studies in chronic T. cruzi infected mice proved that inhibition of TGF-β pathway improved several cardiac electric parameters, reversed the loss of connexin-43 enriched intercellular plaques, reduced fibrosis of the cardiac tissue, restored GATA-6 and Tbox-5 transcription, supporting cardiac recovery. Finally, the therapeutic effects of inhibition are promising and suggest a new possibility to treat cardiac fibrosis in the chronic phase of Chagas' heart disease by TGF-β inhibitors.

Recent Publications

1. FERREIRA, R. R.; WAGHABI, MARIANA C; BAILLY, SABINE; FEIGE, ... ARAUJO-JORGE, T. C. Chagas disease immunogenetics and the search for disease biomarkers: insights from TGF-beta studies. Frontiers in Cellular and Infection Microbiology, v. 14, p. 1, 2022.

2. ARAUJO-JORGE, TANIA C.; RIVERA, MARIA TERESA; VANDERPAS, JEAN; GARZONI, ... FERREIRA, ROBERTO R. Selenium, TGF-Beta and Infectious Endemic Cardiopathy: Lessons from Benchwork to Clinical Application in Chagas Disease. BIOMOLECULES, v. 12, p. 349, 2022.

3. WAGHABI, MARIANA C; FERREIRA, R. R.; ABREU, RAYANE DA SILVA; ... ARAUJO-JORGE, TANIA. Transforming growth factor-β as a therapeutic target for the cardiac damage of Chagas disease. MEMORIAS DO INSTITUTO OSWALDO CRUZ, v. e210395, p. 1-6, 2022.

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