Interview of the Associate Researcher of the Institute of the Chemical Biology (ICB), Dr. Theodora Katsila

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At first, we welcome you to National Hellenic Research Foundation (NHRF) given that you have been recently staffed by NHRF.

Thank you. I would like to remark that this newsletter co-insides with an era of unequivocal creativity. In March 2019, I have joined forces with NHRF/ICB, following my appointment as an Associate Researcher and Head of the Biomarker Discovery & Translational Research laboratory.

Which is the field of your research?

My team works on 3D cancer models, multi-omics and information technologies synergies. My research interests span inter-individual variability and the so-called "actionable -ome", the -ome that matters. Biomarkers are the key to translate information growth into knowledge growth. My vision? Clinical interpretome, no doubt.

So, could you explain further on the way you work in order to fulfill this vision?

For decades, I have been dreaming of a cure. Then, Paracelsus saying "Alle Ding sind Gift und nichts ohn' Gift; allein die Dosis macht, das ein Ding kein Gift ist" ("All things are poison and nothing (is) without poison; only the dose makes that a thing is no poison") became my brain seed, dominated my synapses. No living system resembles another. Unmasking our uniqueness and mapping inter-individual variability, we aim to a. empower our understanding on disease phenotypes (clinical interpretome) and b. delineate risk/benefit ratios upon treatment (actionable -ome). Our toolbox is wisely selected.

- ⇨ 3D cancer models recapitulate best cell (patho)physiology, tumor heterogeneity and tumor microenvironment. At the same time, 3D cancer models offer a highly adaptable and cost-effective state-of-the-art high-throughput screen for preclinical studies and ADMETOX.
- ⇨ Multi-omics accounts for the genomic and environmental interplay and facilitates genotype-to-phenotype associations. Such holistic approaches may be hypothesis-driven or hypothesis-generating. We develop, optimize, validate and integrate (pharmaco)genomics (who are we?), (pharmaco)proteomics (the whys and hows), and (pharmaco)metabolomics (who have we become?).
- ⇨ Information technologies, as defined by HJ Leavitt and TL Whisler (Harvard Business Review), cross-check and account for biases and confounding factors.

I am dreaming of a clinical interpretome, an holistic (clinical) interpretation for each individual.

We would like you to talk to us about your previous research path.

Being a biochemist by training (BSc, Imperial College London), I have been excelling at the intersection of -omics applying LC-MSn coupled to 3D cancer models. I remember falling in love with state-of-the-art approaches in -omics, when I was awarded a placement at the Drug Metabolism and Pharmacokinetics department (MSD, UK) as an Imperial College London graduate. This has been also the time when I appreciated the added value of the industrial mindset, decision-making, and strategy planning. Building on a series of soft and hard skills, the benefit of interchanging pioneering ideas, experience, and expertise became apparent. In early 2000s, the momentum of the British society triangulated with the ethos and spirit of my great teachers and mentors and my non-stop eagerness to observe, question and have impact. To have impact and be of benefit were the reasons that made me return to Greece, gaining insights in Clinical Biochemistry and Molecular Diagnostics (MSc, National Kapodistrian University of Athens), thrilled by cancer immunotherapy and the unmet needs of "bench-to-bedside" biomarkers and Chemistry (PhD, University of Patras/BRFAA). Being at the exponential phase of my learning curve, my postgraduate research in cancer omics

(Vall d'Hebron Institute of Oncology) and (pharmaco) genomics (University of Patras) focused on synergies of multi-omics – namely, (pharmaco)genomics, (pharmaco)proteomics, (pharmaco) metabolomics – with information technologies to account for confounding factors and empower data validation. My research visit at ETH, Zürich paved the way. Today, I breath the Athenian air as an NHRF/ICB researcher.

Has NHRF always been the ideal workplace in order for you to be included in its research staff? If so, for which reason?

Definitely. To have impact and be of benefit. I strongly feel NHRF/ICB is exactly about that. Standing on the shoulders of giants, not to forget the glorious NHRF history, I am a proud member of the NHRF/ICB family.