UTILIZATION OF CLINICAL CHEMISTRY ASSAY PANELS FOR PHENOTYPING MOUSE MODELS AT THE CCP

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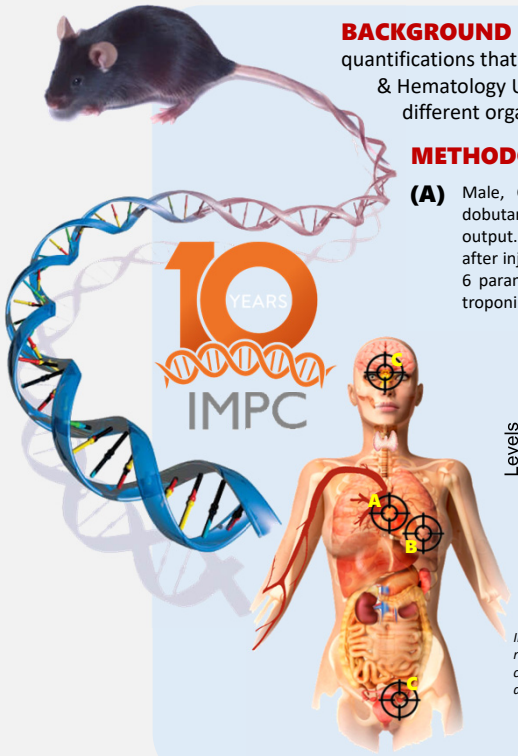
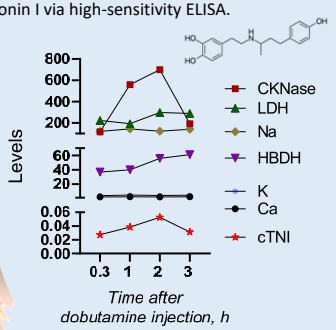


BACKGROUND Clinical chemistry analyses of plasma/serum, urine, and other biological samples comprise of metabolites, ions, enzymes, and serological quantifications that could be used to assess functional abnormalities of different organs of the body. In addition to the standard IMPC screens, the Biochemistry & Hematology Unit of the Czech Centre for Phenogenomics has set-up assays based on multi-faceted approach of phenotyping animal models involving different organ systems.

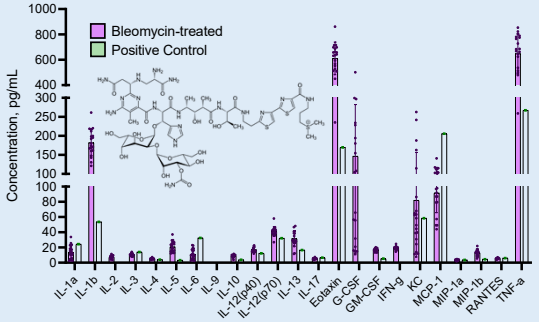
METHODOLOGY AND RESULTS

(A) Male, C57Bl/6NCrl mice were injected with dobutamine i.m. to induce increased cardiac output. Mice were bled at different timepoints after injection. Plasma samples were analyze for 6 parameters using the BC AU480 and cardiac troponin I via high-sensitivity ELISA.



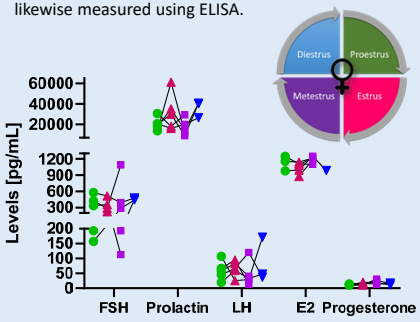
Induction of acute myocardial infarction in mice resulted in increased creatine kinase, α-HBDH, and cardiac troponin-I in the blood after 2h of drug administration.

(B) To study lung inflammation, injury, and fibrosis, bleomycin was used. Blood was isolated from the animals after the treatment protocol. Plasmas were analyzed for 23 cytokines using the BioPlex 200 multiplex system.



Bleomycin-induced lung injury resulted into increased pro-inflammatory cytokines (IL-1, TNF-α, IL-6, IL-12, IFN-γ) and chemokines (KC, MCP-1, Eotaxin) in the blood.

(C) To complement visual and cytologic estrous cycle identification in female mice, the BioPlex 200 multiplex system was used to quantify 3 hormones from the plasma. Progesterone and estrogen were likewise measured using ELISA.



Mixed ANOVA Interaction: p=0.0069

Multiplex assay was able to detect significant interaction between the hormones and the mouse estrous phases

CONCLUSION The combined usage of clinical chemistry analyzer, spectrophotometry, and the multiplex system can serve as a powerful tool for the characterization of different animal models.