

25th World Congress on**CANCER SCIENCE AND THERAPY &**10th World Congress on**BIOMARKERS & CLINICAL RESEARCH**

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**Nikolai V Ivanov***Philip Morris International Research and Development, Switzerland***Pre-clinical and clinical studies in COPD and cardiovascular areas and the role of biomarkers**

Cigarette smoking causes serious diseases including chronic obstructive pulmonary disease (COPD) and cardiovascular disease (CVD). ApoE-deficient mice are prone to developing premature atherosclerosis and emphysema making it an ideal model in which both pathologies can be assessed simultaneously. We evaluated the effects of cigarette smoke (CS) from a cigarette (3R4F) and aerosol from tobacco heating system 2.2 (THS2.2), a candidate modified risk tobacco product. ApoE^{-/-} mice were exposed for up to eight months to the test aerosol for three hours/day, five days/week to a target nicotine concentration of 30 µg/l. After two months of exposure to CS, cessation and switching groups were further exposed for up to six months to fresh air, or THS2.2, respectively. Multiple markers of disease progression were investigated including atherosclerotic plaque formation, pulmonary inflammation, pulmonary function and lung emphysema. Exposure to CS induced time-dependent molecular, physiological and inflammatory pulmonary responses in ApoE^{-/-} mice consistent with emphysematous changes. Significant changes in the lung transcriptome and proteome of ApoE^{-/-} mice were observed in response to CS-exposure compared to sham-exposed mice. Smoking cessation and switching to THS2.2 resulted in lower activation levels compared to continuous exposure to CS. Both, smoking cessation and switching to the THS2.2 halted the rate of disease development as assessed by histopathological and molecular endpoints. At the same time, a clinical study reported as part of a global clinical program for THS was designed to demonstrate sustained exposure reduction to selected HPHCs and to provide first insight on changes in clinical risk endpoints (CREs) in smokers pre-dominantly using tobacco sticks menthol variant (mTHS) for five days in confinement followed by an ambulatory period of 85 days, compared to subjects continuing to smoke menthol cigarettes (mCC) and those who abstained from smoking. Biomarkers of exposure (BoExp) to 16 HPHCs and nicotine were measured to provide an assessment of human uptake of a set of representative toxicants contained in tobacco products. Selected CREs associated with cardiovascular and respiratory diseases and genotoxicity as well as subjective effects to investigate mTHS acceptance compared to mCC were assessed.

Biography

Nikolai V Ivanov currently holds the position of Manager of the Research Technologies Department at Philip Morris International R&D Innovation Cube, Philip Morris Products S A in Neuchatel, Switzerland. In this role, he is responsible for setting the strategic direction of the department and leading genome sequencing, gene expression, proteomics, high performance computing and quality management systems projects. He received his MSc in Mathematics and Computer Science in 2001 and his PhD in Biochemistry in 2002 from Emory University (Atlanta, USA). In 2015, he was awarded a title of Privat Dozent by the University of Neuchatel (Switzerland). He has published more than 40 manuscripts primarily in the area of Systems Toxicology.

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