

while the third, initially wild-type, showed p.F1174L after initiation of second generation ALK-TKI. In a total of 9 patients, including those with secondary ALK point mutations, the KRAS mutation G12D or G12V appeared in blood samples at the time of resistance to TKI.

**Outlook and Expert recommendations:** ddPCR can detect resistance mutations in cftDNA of ALK+ NSCLC and may represent an effective alternative to re-biopsy. Moreover, the assessment of mutated allele burden could be used for response monitoring during treatment. Moreover, the development of KRAS mutations may play a role in resistance to ALK-TKIs.

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## A19

### Recombinant species-specific FcεRI alpha proteins for diagnosis of IgE-mediated allergies in dogs, cats and horses

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*The EPMA Journal* 2016, **7(Suppl 1)**:A19

**Keywords:** FcεRIα, IgE, IgE Fc receptor, Dog, Cat, Horse, Allergy diagnosis

**Background:** Domestic animals, such as dogs, cats and horses develop IgE-mediated allergies comparably to humans (1). Common symptoms include chronic pruritus, papules, erythema, sometimes urticarial lesions and, in cats and horses, asthma. The most prominent clinical phenotype is canine, feline or equine atopic dermatitis (AD) elicited by respiratory (2), food or insect venom allergens. In humans, component resolved diagnosis of allergy using antibodies for IgE detection has recently entered clinical routine. In cats, dogs and horses allergy diagnosis is so far performed with allergen extracts, but recently the usage of the human alpha chain of the high affinity IgE receptor (FcεRIα) is implemented for IgE detection in veterinary diagnosis (3, 4). The high interspecies amino acid homology (54-56 %) is responsible for binding of human FcεRIα with IgE of these species. We hypothesized, however, that the IgE detection could be improved by the use of recombinant species-specific FcεRIα in allergic dogs, cats and horses.

**Methods:** Canine, feline and equine recombinant FcεRIα (rFcεRIα) were expressed in CHO- DUKX B11 cells using a custom SV40-Neo mammalian expression vector. 384 clones of each species were evaluated for their production of IgE-binding rFcεRIα by immunoblotting and Enzyme-Linked Immunosorbent Assay (ELISA) prior to isolation of rFcεRIα from selected clones via anti-FLAG M2 affinity purification.

**Results:** Proper structure of rFcεRIα proteins was confirmed by CD-spectroscopy. Immunoblot and ELISA experiments verified that the three rFcεRIα proteins were able to bind IgE for the respective species with high affinity to serum IgE of each species. Next, the IgE binding capacities of the recombinant alpha chains will be compared in solid phase assays.

**Conclusion:** The detection of serum IgE of veterinary patients by the application of the three species-specific rFcεRIα may offer further tools for improved allergy diagnosis in allergic veterinary patients in the future.

**Sources of funding:** The study was supported by the Austrian Science Fund (FWF) grants SFB F4606-B19, W 1248-B13 (MCCA), and in part by P23398-B11 and W1205-B09 (CCHD).

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## A20

### Global methodology for developmental neurotoxicity testing in humans and animals early and chronically exposed to chemical contaminants

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*The EPMA Journal* 2016, **7(Suppl 1)**:A20

**Keywords:** OMICs approaches, Predictive markers, Chemical contaminants, Central nervous system

The nervous system of children is especially vulnerable to chemical exposure because of a long developmental period beginning shortly after conception and continuing through adolescence. The complex developmental process requires precise coordination of cell growth,

migration and network formation. Brain development can be disrupted by even short-term exposures to chemical agents during critical periods of maturation (i.e., fetal, neonatal and adolescence). This disruption can lead to permanent functional deficits and may predispose to disease later in life. Epidemiological studies suggest an increasing incidence of mental and neurological disorders among children and adults, including autism, attention-deficit hyperactivity disorder and neurodegenerative diseases such as Alzheimer disease. Environmental chemical mixtures, especially when exposures occur early in life, are suspected to contribute to the etiologies of these disorders. Developmental neurotoxicants are among the top 50 compounds listed by ATSDR they include: heavy metals (lead, methylmercury, cadmium...), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (PBDEs) and organochlorine pesticides, namely dichlorodiphenyltrichloroethane (DDT) and hexachlorocyclohexane (HCH). According to the European Commission, there are 143,000 registered chemicals, many which have not been evaluated for possible neurotoxic properties, let alone their effect on the developing human brain.

In this conference, a global methodology using *in vivo*, *ex vivo* and *in vitro* tests as predictive markers for the screening of neurotoxic potential of chemical contaminants will be presented.

#### A21

##### Mental indicators at young people with attributes hypertension and pre-hypertension

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*The EPMA Journal* 2016, **7(Suppl 1):A21**

**Keywords:** Young people, Arterial pressure, Mental indicators

**The actuality:** It was found that the mechanisms of pressure increase are largely dependent on age [1, 2]. In particular, it is assumed that in the development of arterial hypertension (AH) in young contingent significant role is played by the various psychogenic factors [3, 4]. However, such studies carried out are not enough.

**Objective:** Identification of personality profiles for young people including self-centeredness, stress stability, anxiety-depressive disorders (ADD) and features of stress reactivity.

**Material and Methods:** 147 young men aged from 18 till 25 years were examined. Three groups were created: 1 – normal blood pressure (BP) (n=81); 2 – high normal BP, i.e. prehypertension (PH) (n=30); 3 – AH (n=36). For assessment of psychological status the hospital scale of alarm and depression (HADS), questionnaire of stress-resistance and drawing test were used. Last test revealed the various personal qualities of the subject, including creativity, self-esteem, self-centeredness and others. At height of test "The Mathematical Scoring" and in restoration assessment of haemodynamic signs were carried out. Statistical processing was carried out by means of the program BioStat.

**Results:** The tendency of reduction of stress-resistance in groups with increased BP is revealed. The lowered stress-resistance was observed for a third of young men with PH, practically a half of ones with AH and only 16 % of persons with normal BP. A third of young men with PH and a half of young people with AH alarm signs came to light. ADD subclinical is revealed in 12 % and 5 % of persons from the second and third groups of observation. The most significant reaction BP and rhythm in response to stress-test is noted at persons with signs of AH and PH. In individuals from groups of increase BP were significantly more marked with presence of high self-esteem and the desire to achieve high scores of people around.

**Conclusion:** Young people with existence not only AH, but also PH should be carrying out stress-resistance and psychoemotional tests. It is necessary to involve psychotherapist in preventive maintaining in

centers of student health [5] for more personalized prevention programs among young people.

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#### A22

##### On the approaches to the early diagnosis of stress-induced hypertension in young employees of State law enforcement agencies

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*The EPMA Journal* 2016, **7(Suppl 1):A22**

**Keywords:** Job stress, Young men, Arterial hypertension

**The actuality:** Now psycho-emotional stress (PES) is one of the leading risk factors of cardiovascular (CV) diseases, including arterial hypertension (AH) [1]. According to the international multicenter study INTERHEART (2004) PES is among the leading factors of CV risk, ranking third after smoking and dyslipidemia [2]. One variety of chronic PES is job stress (JS) [3], which is far more studied in the field of industry, transport [4], and much less studied in terms of law enforcement [5].

**Objective:** Estimation the features of circadian blood pressure (BP) profile in young men employed in the stress-associated field work of law enforcement.

**Material and methods:** A total of 132 young men, exposed to different severity of JS in type of operational activity (OA) of experience for 1 to 5 years were surveyed. Control group was formed of persons, whose daily work is not related with OA. Circadian monitoring (CM) BP was conducted on different days of the week, comparing results of the office and DMBP determining.

**Results:** It was revealed that the presence of different forms of stress-induced AH - stable, isolated office and hidden ones were significantly more often compared to the control group. The most significant violations identified by the time indices of increasing BP day and night, as well as the speed of morning rise BP. In output day, violations of DMBP leveled, that confirms the stressful nature of diagnosed AH.

**Conclusion:** It is proposed the use of CMBP during regular medical examinations of young men, exposed to the JS, in order to carry out differential diagnosis of various forms of stressful AH in a good time. This can be useful for the further conduct of individualized prevention programs [1] in the workplace.

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