

2<sup>nd</sup> International Conference on

# CANCER BIOLOGY, THERAPEUTICS AND DRUG DISCOVERY AND DELIVERY

&

10<sup>th</sup> Annual Congress on

## BIOMARKERS, CLINICAL RESEARCH & THERAPEUTICS

October 03-04, 2018 | Los Angeles, USA

### Is 2<sup>nd</sup> to 4<sup>th</sup> digit ratio a reliable biomarker for autism spectrum disorders?

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The 2D:4D ratio (second to fourth digit ratio) is sexually dimorphic; males of the different population studied so far, had lower 2D:4D than females. It is generally assumed that the sexual dimorphism is established during early prenatal development under the influence of sex hormones and the 2D:4D ratio is supposed to remain stable after early prenatal stages. Proponents of the extreme male brain theory suggested that an increased androgen exposure *in utero* may contribute to the development of autism spectrum disorders. The aim of our study was to test whether 2D:4D is sexually dimorphic, stable and a valid biomarker for autism. Our results showed a significant difference ( $P = 0.0001$ ) in the digit ratio of the right hand and sexual dimorphism in the expected direction – females ( $N = 86$ ) had, on average, the ratio of 0.979 and males ( $N = 86$ ) the ratio of 0.96 in Slovak adult population. This sexual dimorphism in 2D:4D ratio occurred even in children of the same population, in girls ( $N = 52$ ) the average digit ratio was 0.957, while in boys ( $N = 56$ ) the average digit ratio was 0.945. However, our findings also suggest that the 2D:4D ratio does not remain constant throughout the lifespan, but slowly increases in a stable manner during childhood. Very significant differences could be found in the digit ratio of Slovak boys and girls when compared to adults for both the right hand ( $P = 0.0031$  boys,  $P < 0.0001$  girls) and left hand ( $P = 0.0068$  boys,  $P = 0.0177$  girls). After testing whether this ratio correlates with the Autism quotient of adults diagnosed with Asperger's syndrome, no correlation was assessed. Our study indicates that the 2D:4D ratio could not be a reliable biomarker for autism spectrum disorders. This study was supported by grant APVV 15-0045 and APVV 15-0085.

#### Biography

Klaudia Kyselcova has her expertise in physical anthropology. At The Academic Research Center for Autism (ARCA, Comenius University, Slovakia) she is actively seeking for biomarkers for autism spectrum disorders. Part of her research focuses on anthropometric evaluations of the autism phenotype and dactyloscopic traits of children and adults diagnosed with ASD (Autism spectrum disorders). This is one of the approaches of ARCA towards fully explaining etiopathological mechanisms of autism with direct implications on clinical care and pharmacological interventions.

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