Doping with anabolic agents is a topic in sports where strength is crucial, e.g. sprinting, weight lifting and many more. Testosterone and its functional analogs are the drugs of choice taken as pills, creams, tape or injections to increase muscle mass and body performance, and to reduce body fat. Stanozolol (17β-hydroxy-17α-methyl-5α-androst-2-eno[3,2c]pyrazol) is a testosterone analogue with the same anabolic effect like testosterone but its ring structure makes it possible to take it orally. Therefore, stanozolol is one of the most frequently used anabolic steroids. Common verification methods for anabolic drugs exist, identifying the chemicals in tissues, like hair or blood samples. The idea of this feasibility study was to search for specific gene expression regulations induced by stanozolol to identify the possible influence of the synthetically hormone on different metabolic pathways. Finding biomarkers for anabolic drugs could be supportive of the existing methods and an additional proof for illegal drug abuse. In two separate cell cultures, human HFDPC (hair follicle dermal papilla cells) from a female and a male donor were treated with stanozolol. In the female cell culture treatment
concentrations of 0 nM (control), 1 nM, 10 nM and 100 nM were chosen. Cells were taken 0 h, 6 h, 24 h and 48 h after stimulation and totalRNA was extracted. Learning from the results of the pilot experiment, the male cell culture was treated in 10 nM and 100 nM concentrations and taken after 0 h, 6 h, 24 h and 72 h. Using quantitative real-time RT-PCR expression of characteristics of different target genes were analysed. Totally 13 genes were selected according to their functionality by screening the actual literature and composed to functional groups: factors of apoptosis regulation were Fas Ligand (FasL), its receptor (FasR), Caspase 8 and Bcl-2. Androgen receptor (AR) and both estrogen receptors (ERα, ERβ) were summarized in the steroid receptor group. The growth factor group included the insulin like growth factor receptor (IGF1R) and growth hormone receptor (GHR). Fibroblast growth factor 2 (FGF2) and keratinocyte growth factor (FGF7) were summarized in the hair cycle factor group. 5α-Steroidreductases (SRD5A1, SRD5A2) represented the enzyme group. Three reference genes were taken for relative quantification: ubiquitin (UBQ), glyceraldehyde-3-phosphate-dehydrogenase (GAPDH), and β-actin (ACTB). In cell culture 1 AR, FasR, FGF2 showed significant regulations within one treatment time, significant gene expressions over time were analysed for Caspase 8. In cell culture 2 AR, FasR and SRD5A2 were significantly regulated within one treatment time. In this feasibility study first biomarker for a screening pattern of anabolic agents could be identified providing the rationality to investigate modified, metabolic pathways in the whole hair follicle. Gene Expression in Hair Follicle Dermal Papilla Cells after Treatment with Stanozolol (PDF Download Available). Available from: https://www.researchgate.net/publication/26715017_Gene_Expression_in_Hair_Follicle_Dermal_Papilla_Cells_after_Treatment_with_Stanozolol [accessed Jun 27, 2017].
TUM Einrichtung:  
Sportbiologie

Occurences:

· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage) > Publikationen 2010 und älter
· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage) > Schönfelder
· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Präventive Pädiatrie (Prof. Oberhoffer) > Schönfelder M
· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Präventive Pädiatrie (Prof. Oberhoffer) > Publikationen nach Autor > S > Schönfelder M
· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage)
· Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Präventive Pädiatrie (Prof. Oberhoffer) > Typen > Zeitschriftenartikel

entries: