Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Saw Palmetto-Induced Inhibition of 5a-reductase as a Clinical Treatment for PCOS Symptoms

Finalist's Name: Mishika Bhatia

School and City: Rock Canyon High School, Littleton

Sponsor's Name: Susanne Petri

Category: Biomedical & Health Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Polycystic Ovarian Syndrome (PCOS) is an endocrine disorder affecting millions of women worldwide. It is characterized by irregular periods, insulin resistance, excess androgens, and small cysts in the ovaries. PCOS is typically managed using hormonal birth control, and patients are prescribed a variety of medications for their symptoms. This experiment used Saw Palmetto Extract (SPE) to inhibit the 5-reductase Pathway in Human Follicle Dermal Papilla Cells (HFDPC) in vitro. Excess dihydrotestosterone (DHT) causes common clinical symptoms of PCOS. I hypothesized that SPE would decrease DHT production in HFDPC because SPE is an inhibitor of 5-reductase, preventing the binding of DHT to cytosolic androgen receptors. The experimental groups employed 0.5 and 1.0 µL SPE and endogenous testosterone. Cell culture media was collected for control and experimental cultures for two incubation times. DHT ELISA assays quantified the presence of DHT in the media taken from the experimental and control groups, comparing the DHT concentration of SPE cultures to non-SPE cultures. An ANOVA test demonstrated that cell cultures with SPE produced less cellular DHT compared to a non-SPE control group, and yielded statistical significance with a p-value of 4.28x10-14. An Emax model suggested that SPE was most effective at inhibiting DHT secretion when cells were treated with 1.0 µL SPE for four hours. As a preclinical study, this experiment demonstrates the promising potential of SPE to reduce DHT production in vitro in HFDPC and as a clinical treatment for PCOS symptoms.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature: Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**