Air pollution linked to hair loss, new research reveals

(MADRID, 9 October, 2019) Research presented today at the 28th EADV Congress in Madrid shows, for the first time, that exposure to common air pollutants known as particulate matter (PM) is linked to hair loss in humans¹.

The research was conducted by exposing cells from the human scalp at the base of hair follicles, known as human follicle dermal papilla cells (HFDPCs), to various concentrations of PM10-like dust and diesel particulate. After 24 hours the researchers performed a scientific process, known as western blotting, to detect the levels of specific proteins in the cells. The results showed that the presence of PM10 and diesel particulate decreased levels of β-catenin, the protein responsible for hair growth and morphogenesis.

The study also revealed that the levels of three other proteins (cyclin D1, cyclin E and CDK2), which are responsible for hair growth and hair retention, were decreased by PM10-like dust and diesel particulate in a dose dependent manner, meaning that the greater the level of pollutant, the greater the decrease in proteins was found.

Particulate matter (PM) is the term used to describe a mixture of solid particles and droplets found in the air. PM is divided into two categories; PM10 which are particles with a diameter of 10 micrometres or smaller and PM2.5 which have a diameter of 2.5 micrometres or smaller¹. Both PM10 and PM2.5 are considered to be major pollutants and are linked to various serious health conditions, such as heart and lung disease, cancer and respiratory problems. In total, ambient air pollution is estimated to kill 4.2 million people every year³ but the effects on the skin and hair are not well known.

Sources of PM include the burning of fossil fuels, including petrol, diesel and other solid-fuels such as coal, oil and biomass as well as other industrial activities such as building, mining and the manufacturing of building materials like cement, ceramics and bricks⁴.

Lead researcher, Hyuk Chul Kwon from the Future Science Research Centre in the Republic of Korea, comments; “While the link between air pollution and serious diseases such as cancer, COPD and CVD are well established there is little to no research on the effect of particular matter exposure on the human skin and hair in particular. Our research explains the mode of action of air pollutants on human follicle dermal papilla cells, showing how the most common air pollutants lead to hair loss”.

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Notes to Editors

A reference to the 28th EADV Congress must be included when communicating any information within this press release.

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About the Future Science Research Centre:

The Future Science Research Centre is based at Coreana Cosmetic, Republic of Korea. Coreana Cosmetic is known as one of the top-class cosmetics companies producing and distributing Korean cosmetics for 30 years since 1988. Songpa R&D center, which is the pride of Coreana Cosmetics, is leading Korean cosmetics industry with high technologies and securing them by having patents.

About EADV:

Founded in 1987, EADV is a non-profit organisation whose vision is to be the premier European Dermato-Venereology Society. The Academy counts over 7,000 members from 100 countries, providing a valuable service for every type of dermato-venereologist professional. EADV are dedicated to advancing patient care, education and research by providing a unique platform to bring people together and share ideas.

The EADV Congress takes place every year and attracts over 13,000 attendees. Boasting an exceptional Scientific Programme and educational experience with more than 180 sessions across various tracks, expert speakers will discuss the latest advances and information on trending topics in dermatology.

Find out more via the EADV website: https://www.eadv.org/

References:

1. Effects of particular matter on human dermal papilla (Hyuk Chul Kwon). Presented at the 28th EADV Congress, Madrid, 9 October, 2019
2. United States Environmental Protection Agency. Particulate Matter (PM) Pollution. Available at: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics