

Free radicals in air trigger respiratory diseases

The presence of free radicals in the air could irreversibly damage amino acids, the body's building blocks, and trigger respiratory diseases.

A radical like nitrate is formed by two common pollutants - nitrogen dioxide, emitted by car exhausts and ozone, a greenhouse gas that is harmful to humans. The sun's UV radiation also breaks down the nitrate radicals, but these concentrations rise as soon as it sets.

'We were very interested to see what these nitrate radicals do to the human body since we breathe them in at night,' said Duanne Sigmund and Uta Wille, of the University of Melbourne.

'Our results suggest that the nitrate radical could be a real culprit for respiratory diseases, yet until this study the nitrate radical has been previously entirely overlooked in regard to causes for diseases such as asthma,' said Sigmund.

The duo have found that the nitrate radical reacts with amino acids to form compounds such as beta-nitrate esters, beta-carbonyl, and aromatic nitro-compounds.

Some of these compounds have been associated with increased immune response in some respiratory diseases, creating worse symptoms.

Their work is being published in the Royal Society of Chemistry's Chemical Communications journal.

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