

## **Deoxyribonucleic acid (DNA) methylation in children exposed to air pollution: a possible mechanism underlying respiratory health effects development**

### **ABSTRACT**

Air pollution is a substantial environmental threat to children and acts as acute and chronic disease risk factors alike. Several studies have previously evaluated epigenetic modifications concerning its exposure across various life stages. However, findings on epigenetic modifications as the consequences of air pollution during childhood are rather minimal. This review evaluated highly relevant studies in the field to analyze the existing literature regarding exposure to air pollution, with a focus on epigenetic alterations during childhood and their connections with respiratory health effects. The search was conducted using readily available electronic databases (PubMed and ScienceDirect) to screen for children's studies on epigenetic mechanisms following either pre- or post-natal exposure to air pollutants. Studies relevant enough and matched the predetermined criteria were chosen to be reviewed. Non-English articles and studies that did not report both air monitoring and epigenetic outcomes in the same article were excluded. The review found that epigenetic changes have been linked with exposure to air pollutants during early life with evidence and reports of how they may deregulate the epigenome balance, thus inducing disease progression in the future. Epigenetic studies evolve as a promising new approach in deciphering the underlying impacts of air pollution on deoxyribonucleic acid (DNA) due to links established between some of these epigenetic mechanisms and illnesses.

**Keyword:** DNA methylation; Children; Respiratory health effect; Review; Vulnerable populations