

ABSTRACTS FOR ORAL PRESENTATIONS

Molecular Epidemiology: Application and Challenges for the 21st Century

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Background: Since the 1970s, people's understanding of life has gradually deepened into the basic material nucleic acid and protein levels of life. The life sciences have entered the era of "molecules" and produced a large number of new and interdisciplinary subjects. An important direction has had a major and profound impact on the development of epidemiology itself and on disease control. **Objectives:** This article focused on the contribution and significance of molecular epidemiology based on the respective characteristics and research progress of molecular epidemiology, and looked into the future opportunities and challenges of molecular epidemiology. **Methods:** Literature search was done through electronic databases of PubMed and Google Search. The related articles are reviewed and findings combined and compared to achieve a conclusion. **Results:** Molecular epidemiology was developed by cross-convergence of traditional epidemiology with molecular biology, molecular genetics, molecular immunology, molecular microbiology, genomics, proteomics, etc., which represents the development of epidemiology. It requires collaboration among epidemiologists, human geneticists, environmental health scientists, health professionals, biostatisticians, and basic scientists. Descriptive molecular epidemiology assesses effects and/ or outcomes early in the disease process, reduces heterogeneity in disease classification, and examines the distribution of markers of

susceptibility or exposure; whilst analytical molecular epidemiology utilizes biological markers to replace surrogate measures that have been typically employed for traditional epidemiologic studies. Challenges for molecular epidemiology include development and sustaining collaboration among different individuals, the current state of molecular data collected for public health of which include missing data, biased sampling and small scale outbreaks, and translations of the

results of molecular epidemiology studies to various stakeholders. **Conclusions:** Epidemiologists applied molecular biology theories and techniques to disease prevention and health promotion in the population with promising development. Molecular epidemiology contributes to more precise measure of exposure and susceptibility. Targeted approaches may be more effective in preventing disease.