

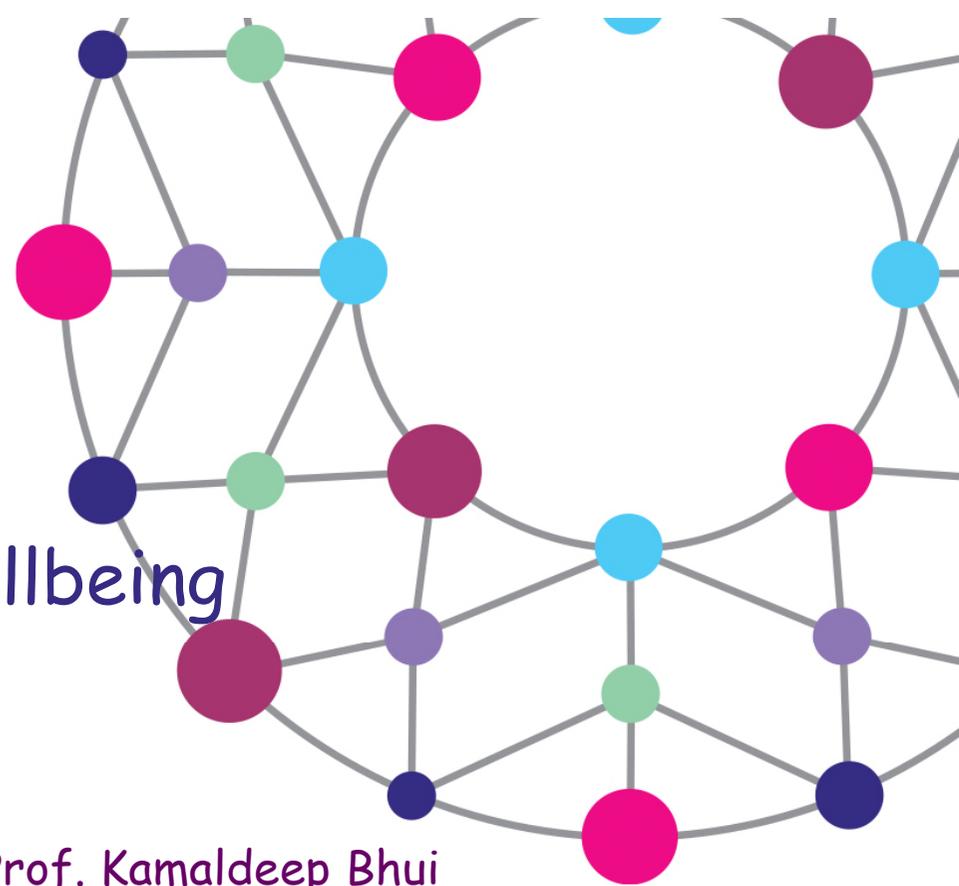


## Theme 3. Human Health, Behaviour and Wellbeing

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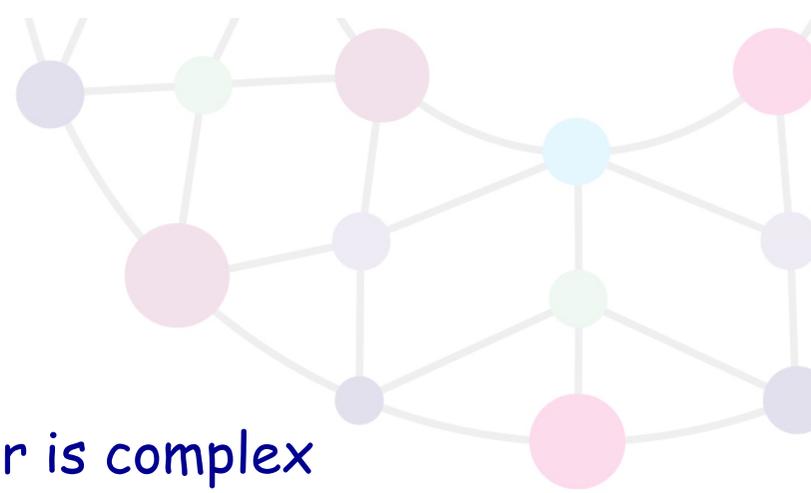
## Background

- In the UK 28-36,000 deaths annually due to particulate air pollution (PHE, 2019)
- Role of BioPM and exposures unknown
- Improvements in human health effects of BioPM will require innovative thinking and approaches
- Co-operation across disciplines and sectors including many not traditionally engaged with air pollution.

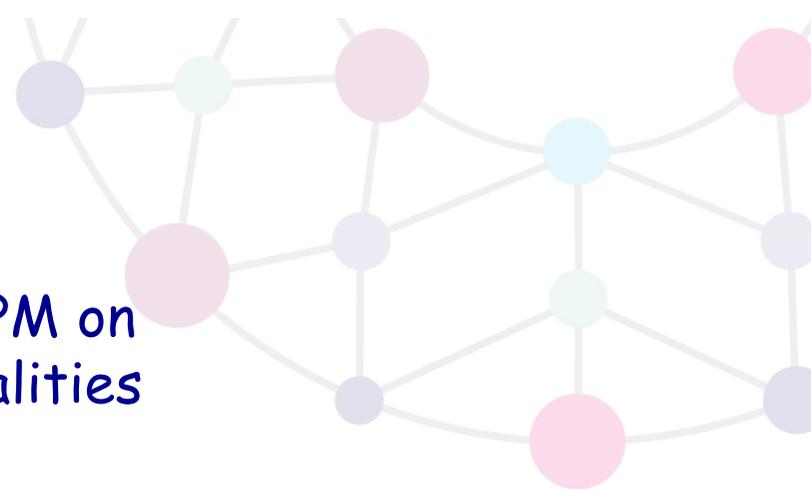


## Problems to be addressed:

- Levels of exposure to BioPM indoor/outdoor air is complex
- Linking health impacts to different scenarios
- Health impacts linked to inflammation and immune responses
- Health outcomes linked to infection, chronic conditions (eg asthma) and susceptible groups (eg Cystic Fibrosis)
- Social pattern of health inequalities - poorest/excluded have highest mortality
- Need to understand biological, social, economic and environmental factors for human exposure



## Theme 3 - Understanding impacts of BioPM on Inflammation, immunity and health inequalities

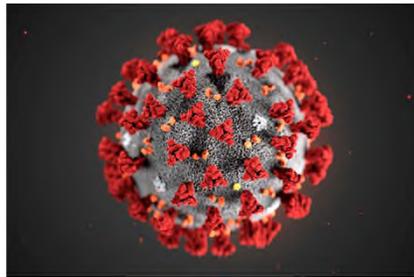


## Theme 3 Aims:

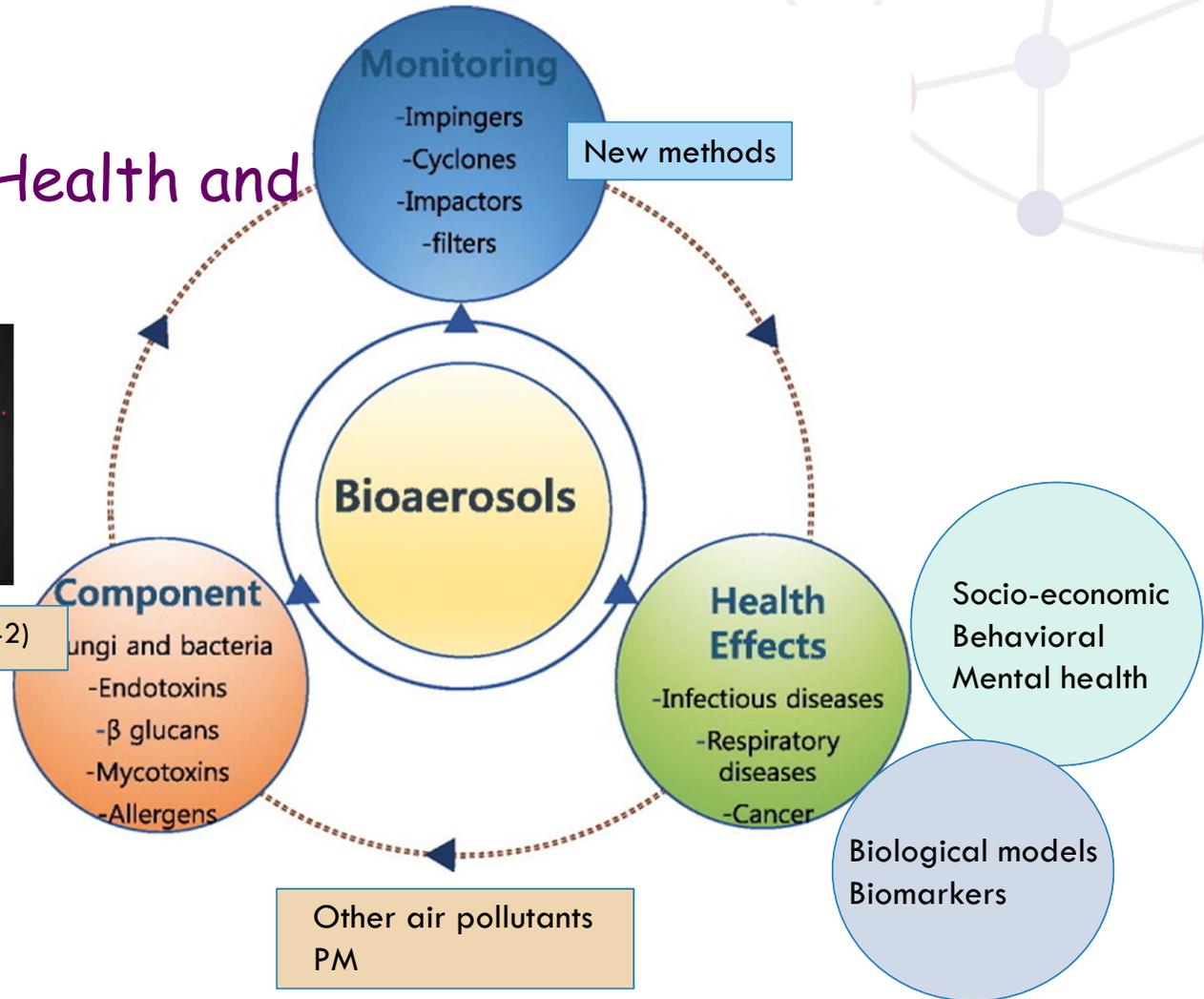
- Translate knowledge of BioPM sources and composition (Themes 1 and 2) to better understand human exposure to BioPM and health consequences.
- Will include biological modelling and pathways to develop 'biomarkers' of exposure and health
- Dose-response relationships and dispersal patterns
- Computational modelling of environmental impacts
- Inform policy (Theme 4)



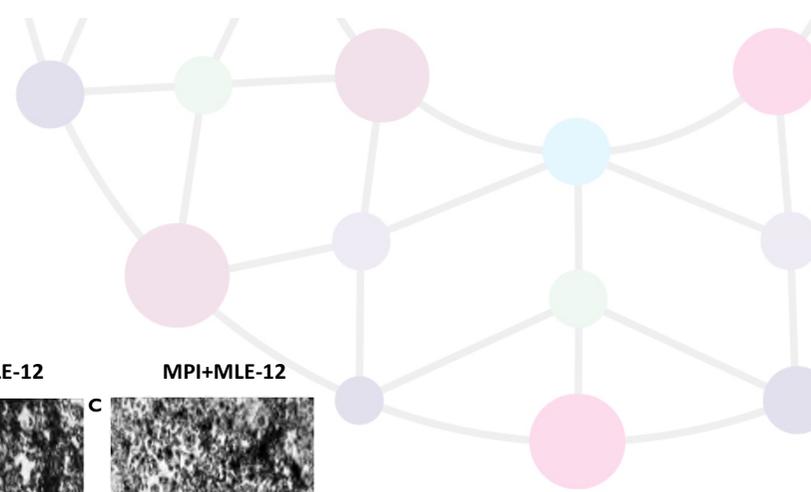
# Theme 3: Health, Public Health and Society



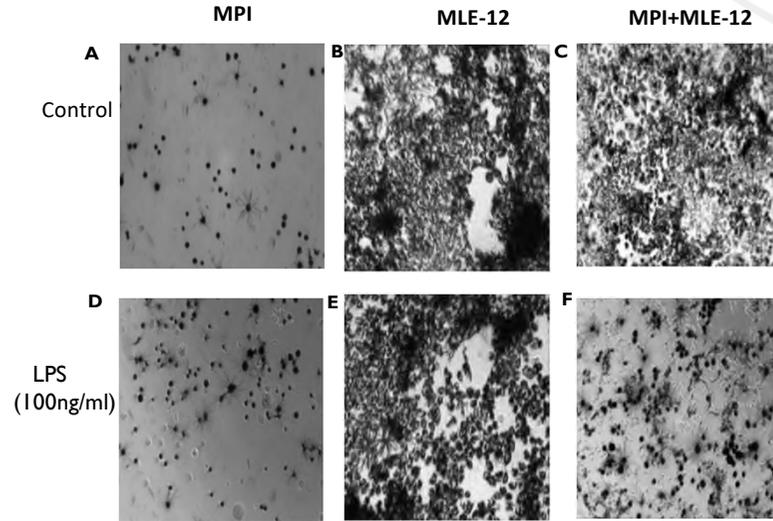
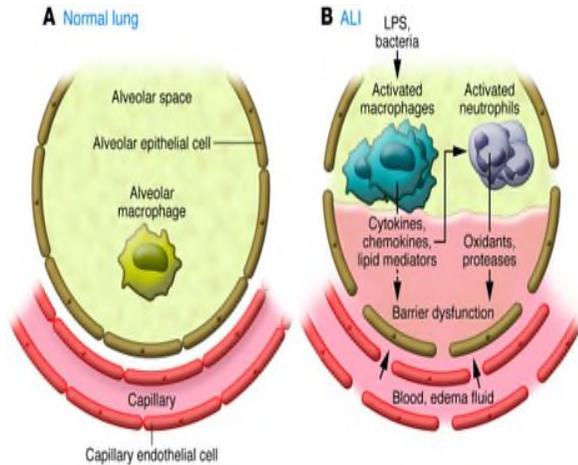
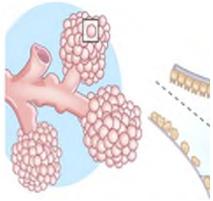
Viruses (SARS-CoV-2)



# Biological models



## Alveoli



Secretomics - biomarkers

## Mental Illness - the role of BioPM

Mental illness is associated with premature mortality due to conditions linked with inflammation. Are they amenable to anti-inflammatory treatments?

Could poor health related to pollution be relevant for the growing levels of poor mental health as an independent or interacting risk?

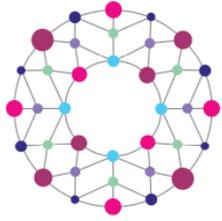
Could BioPM +/- other pollutants lead to sufficient inflammatory responses amongst high risk populations to lead to new onset or worsening of risks of developing existing mental illnesses?

To what extent can BioPM pollution explain the urban effect of higher incidence of severe mental illness, when tested against other drivers of poor health?



## Mental Illness and BioPM - Potential studies

- 1) evidence review and synthesis of clinical and biological and environmental literature and inflammatory pathways to adolescent mental illnesses;
- 2) school based studies extending what is being proposed to collecting phenotype information from structured validated questionnaires; such studies are well established and we have access to the bank of questions used (RELACH, DASH, REACH). These could consider socioeconomic deprivation at individual and area levels, including markers such as ethnicity, and correlations with exposure to bioaerosols and other PM.



BioAirNet.

Thank you!

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