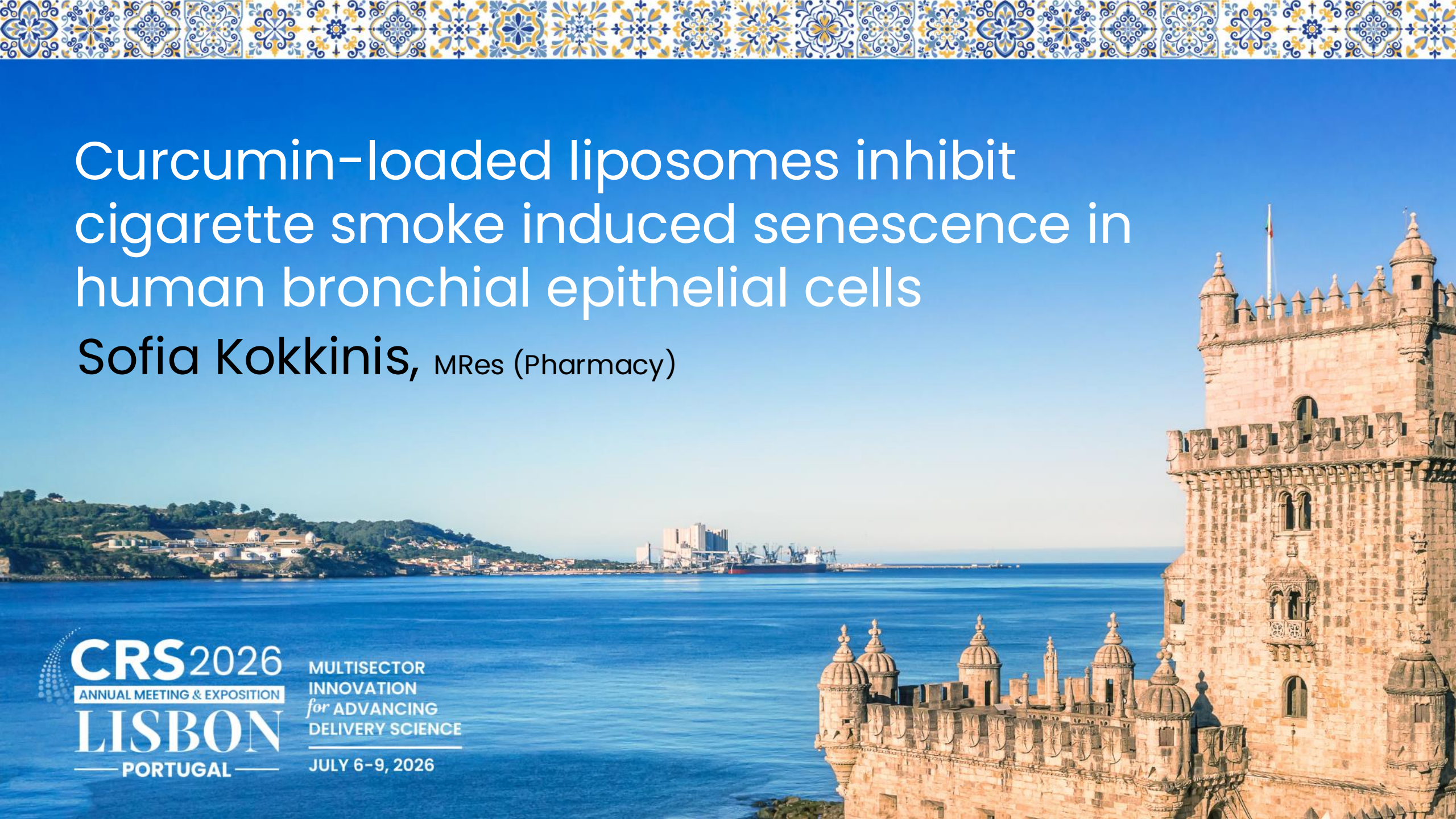




Curcumin-loaded liposomes inhibit cigarette smoke induced senescence in human bronchial epithelial cells

Sofia Kokkinis, MRes (Pharmacy)



CRS2026
ANNUAL MEETING & EXPOSITION
LISBON
— PORTUGAL —

MULTISECTOR
INNOVATION
for ADVANCING
DELIVERY SCIENCE

JULY 6–9, 2026

Chronic respiratory diseases



Increased pollution, infections & changes to lifestyle

Decreased Lung function, Difficulties breathing^[1]

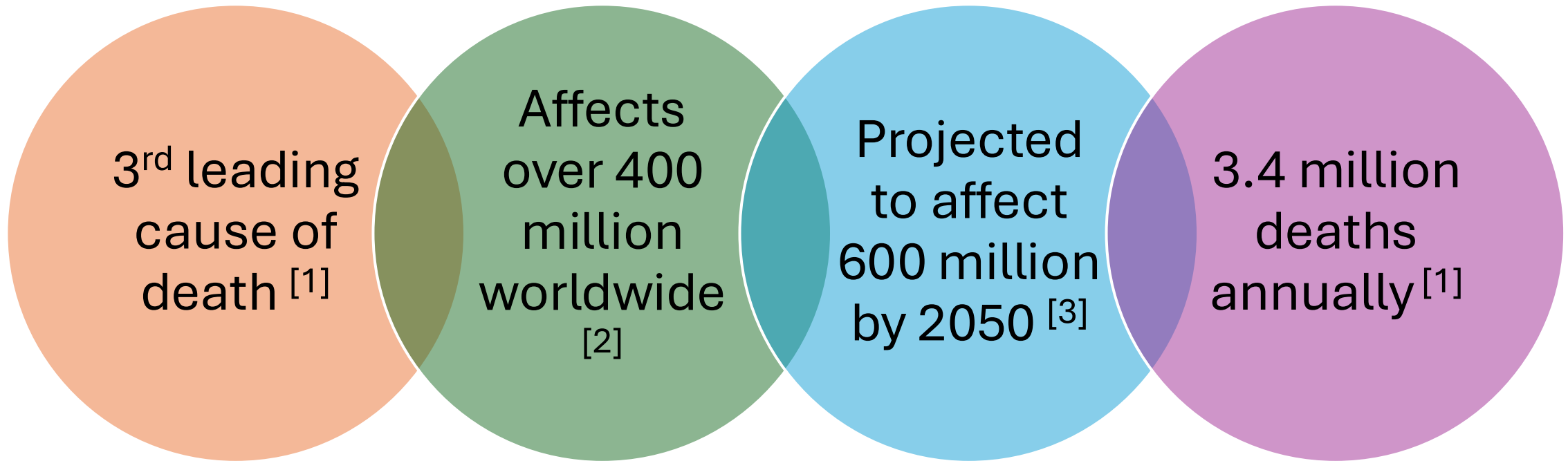
Typically caused from chronic smoking ^[3]

Often leads to lung cancer ^[2]

1. Decramer et al., Chronic obstructive pulmonary disease. *Lancet* (2012) 2. Parris et al., *Journal of Thoracic Disease* 2019 Pages S2155–S2172 3. Samet et al., The 1990 report of the US EPA Radon Assessment, in *Health Physics*. 2005



Global burden



1. WHO, Global Burden of Disease Collaborative Network (2026) 2. De Oca MD et al., The global burden of COPD: epidemiology and effect of prevention strategies (2025) 3. E Boers et al., Global Burden of Chronic Obstructive Pulmonary Disease Through 2050. (2023)



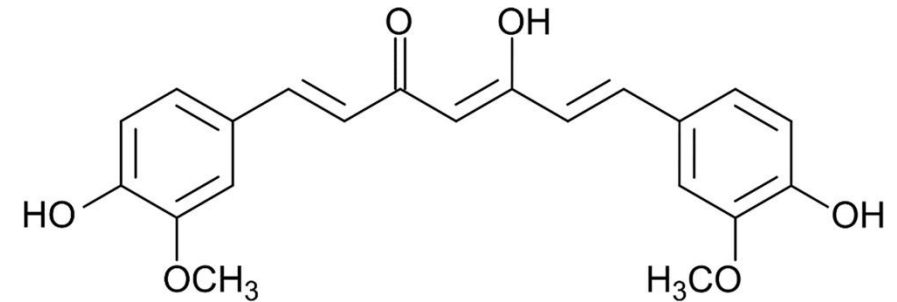
Curcumin

Properties

- Polyphenol
- Antioxidant
- Anti-inflammatory
- Neutralises reactive oxidative species

Limitations

- Poor water solubility
- Low bioavailability
- BCS class 4

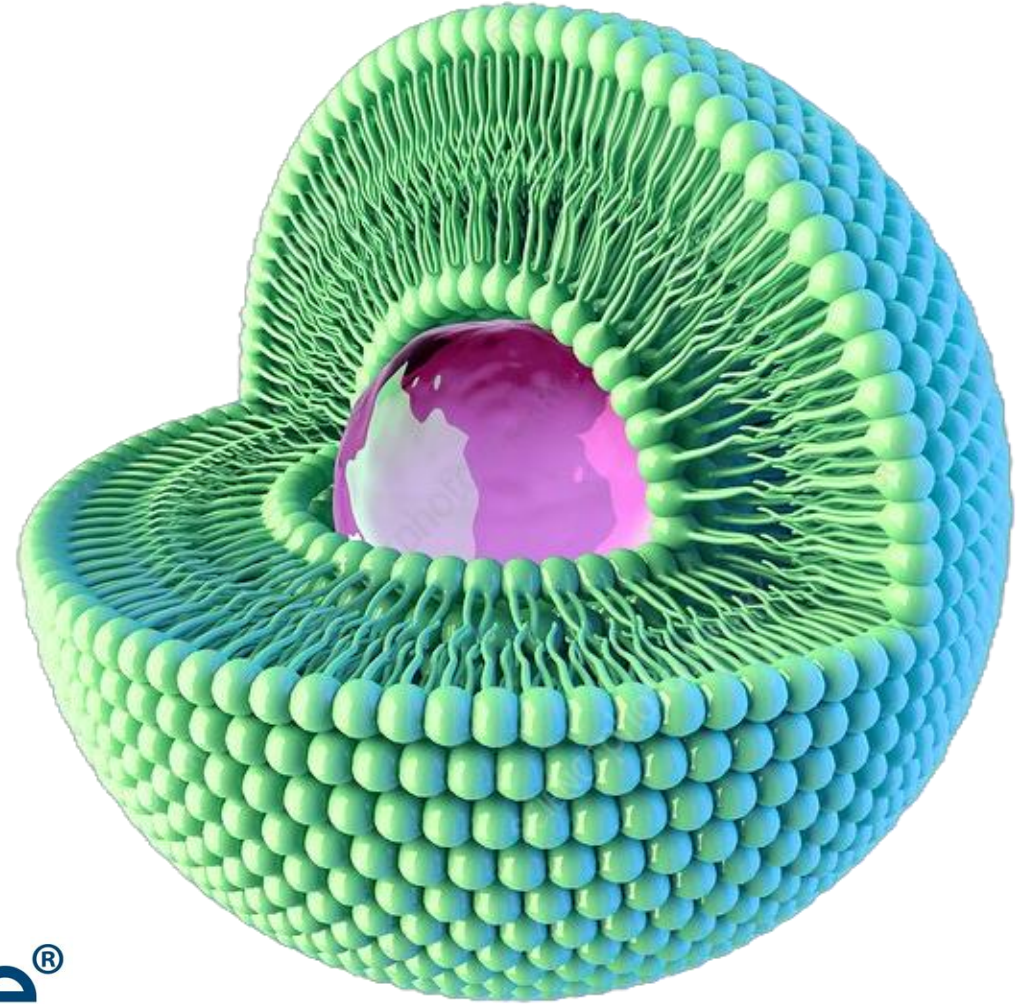


Liposomal delivery

- Sydney based
- Unique solutions
- Advanced delivery system
- Improve bioavailability of poorly absorbed actives
- passive loading of active in phosphatidylcholine

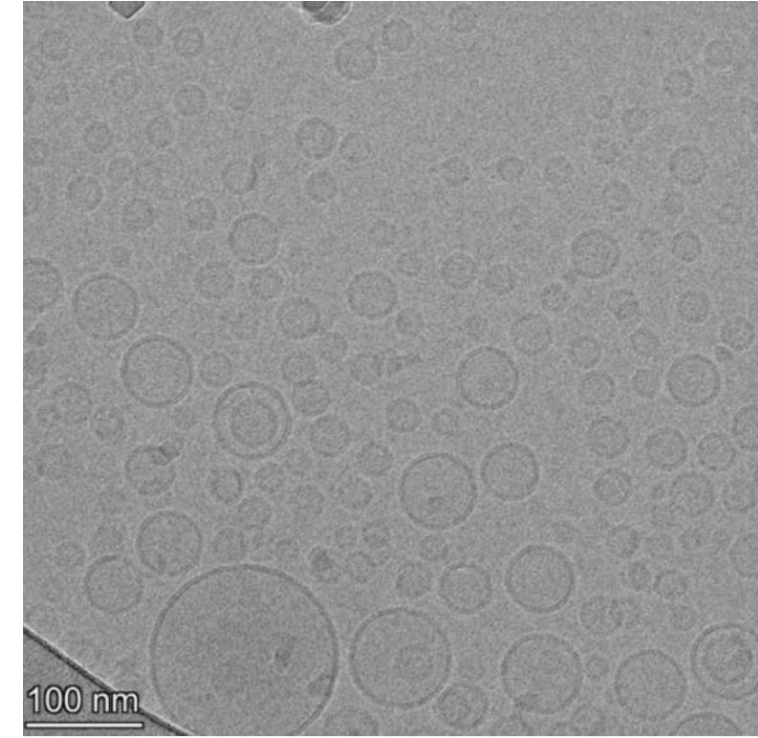
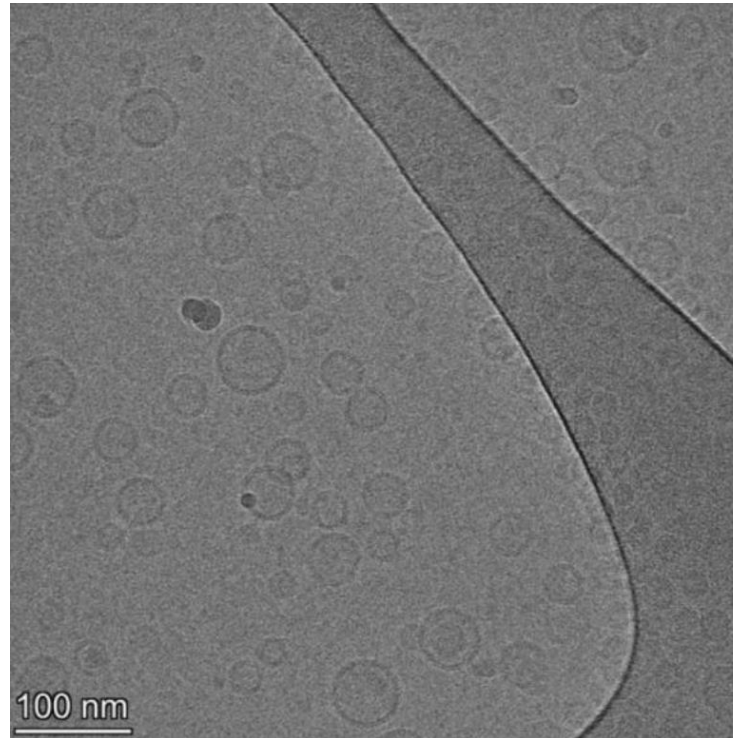
pharmako.
BIOTECHNOLOGIES

PZ
PlexoZome®



Characterisation of PlexoZome®

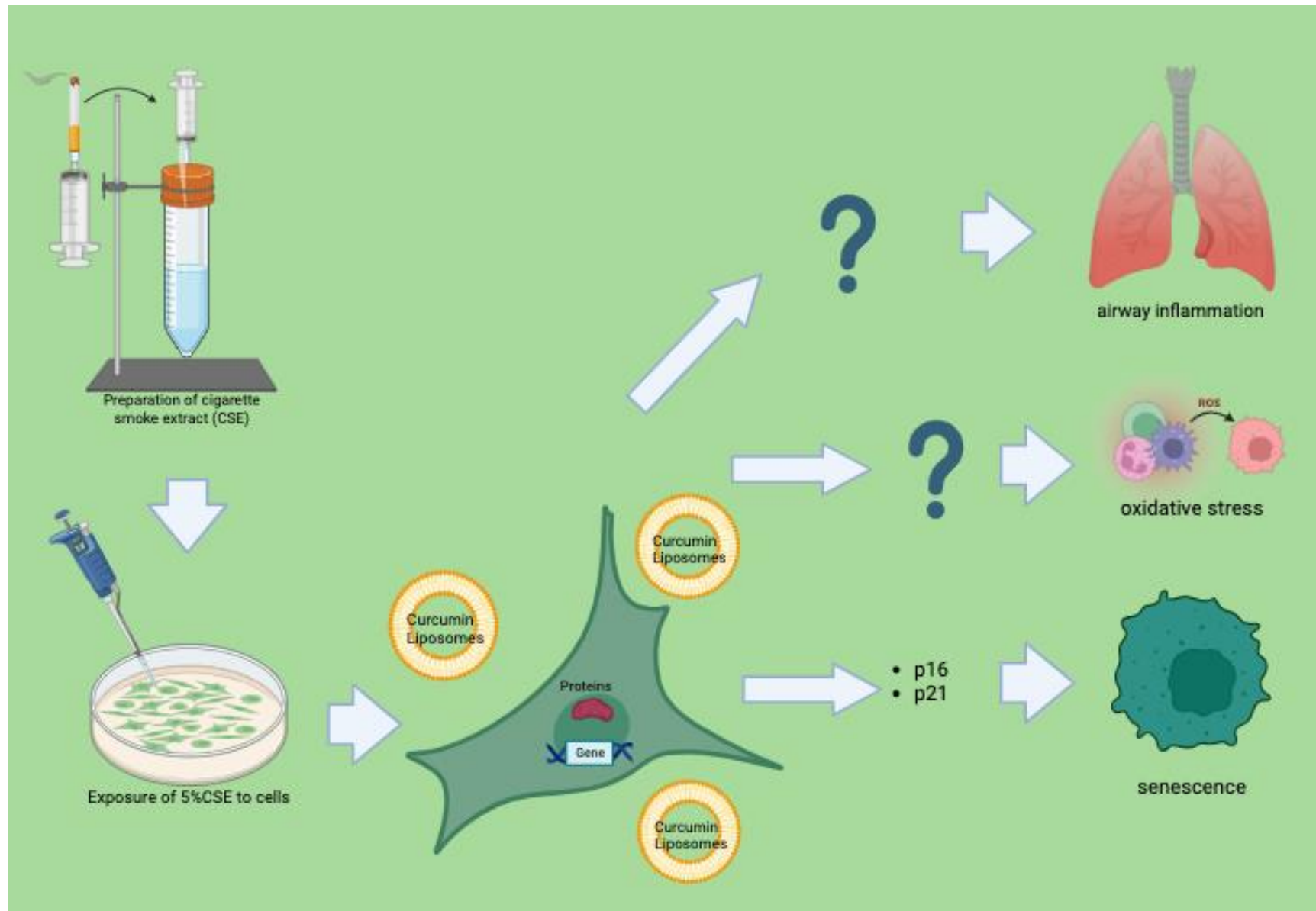
Z-average	51.12 nm
Zeta potential	- 34.57 mV
Polydispersity index (PI)	0.2431



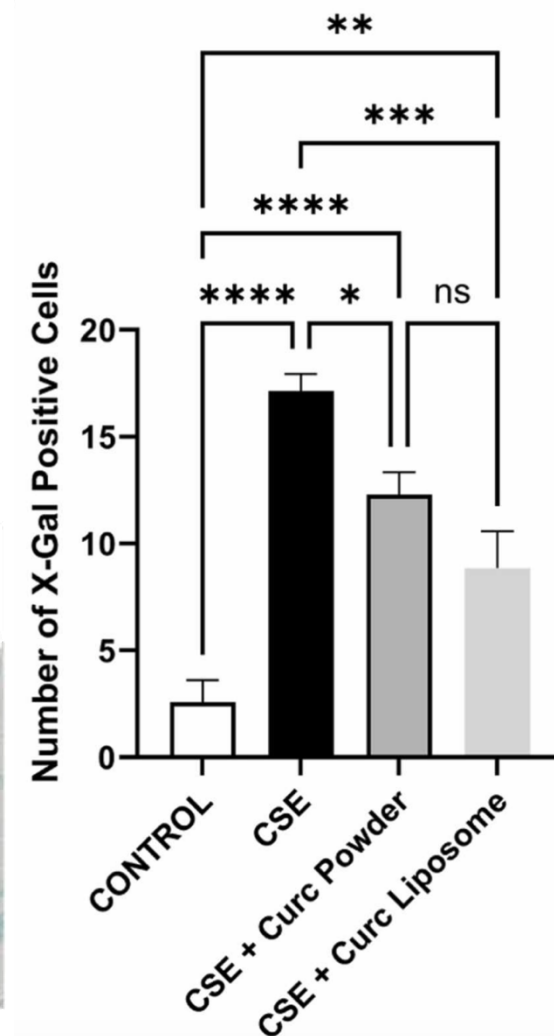
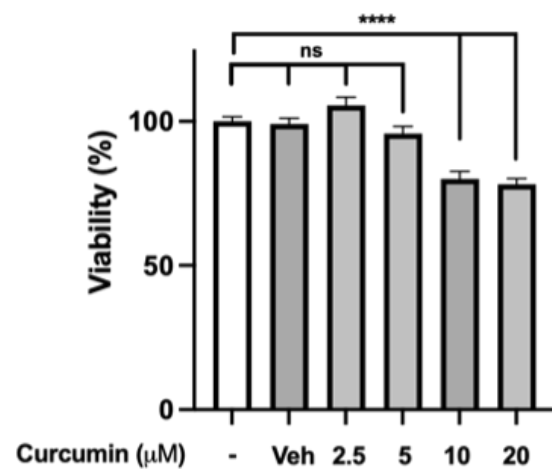
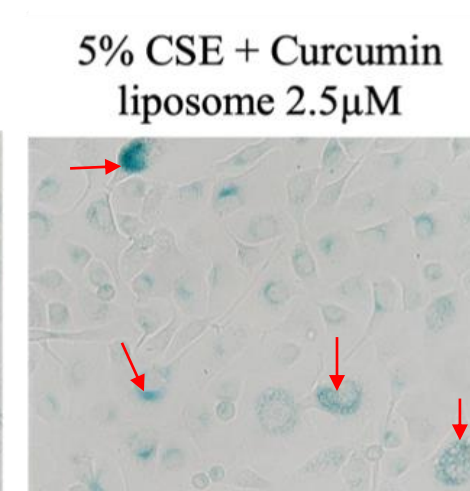
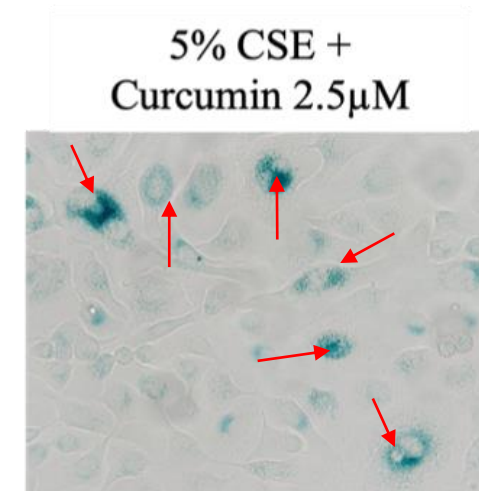
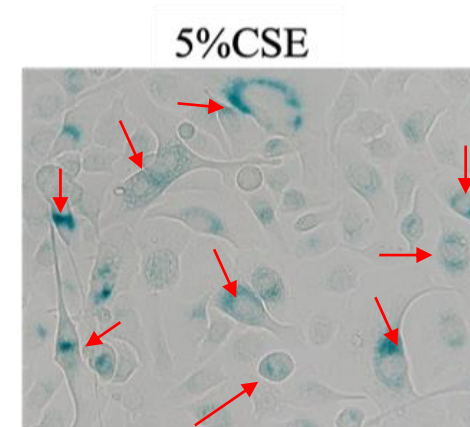
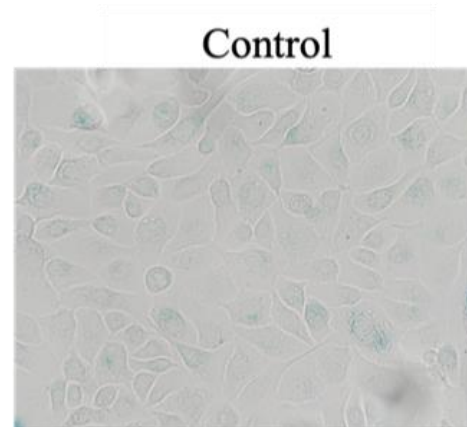
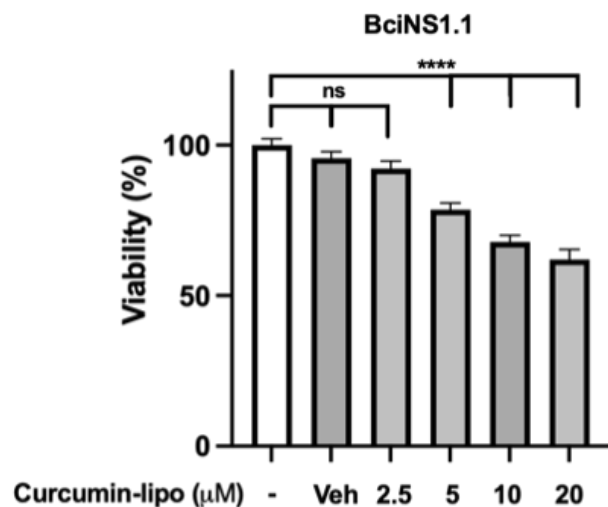
*We aimed to use **liposomal** technology to deliver **curcumin** to **reduce hallmarks** of COPD caused by cigarette smoke exposure*



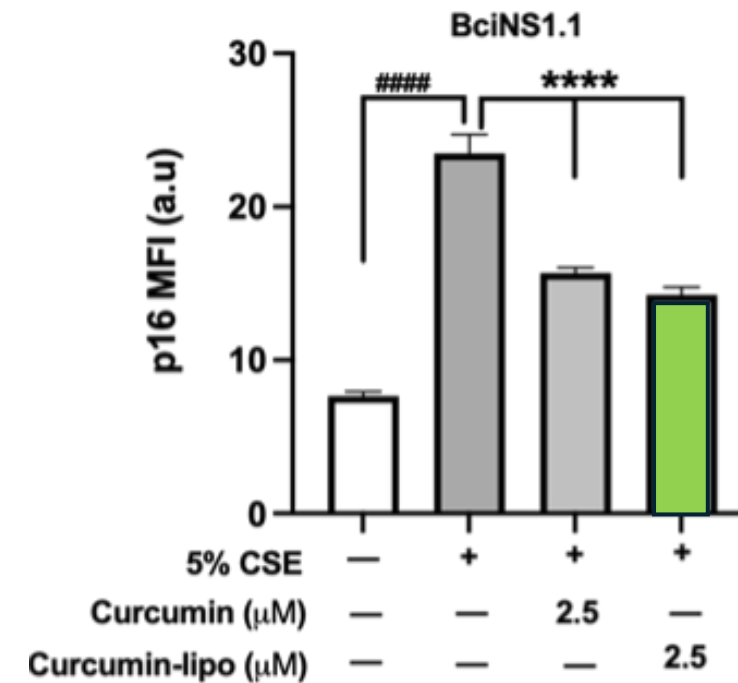
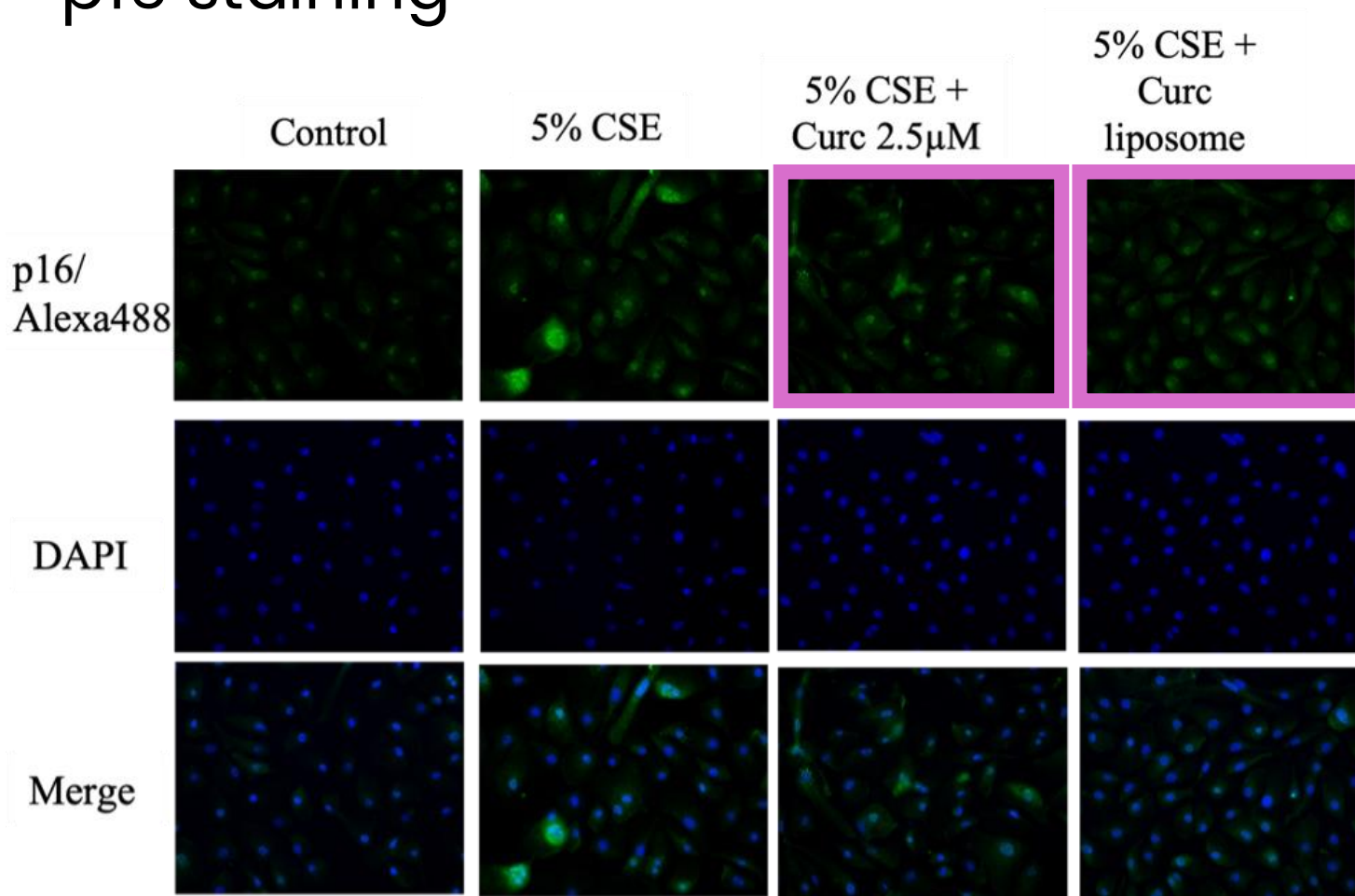
Methods



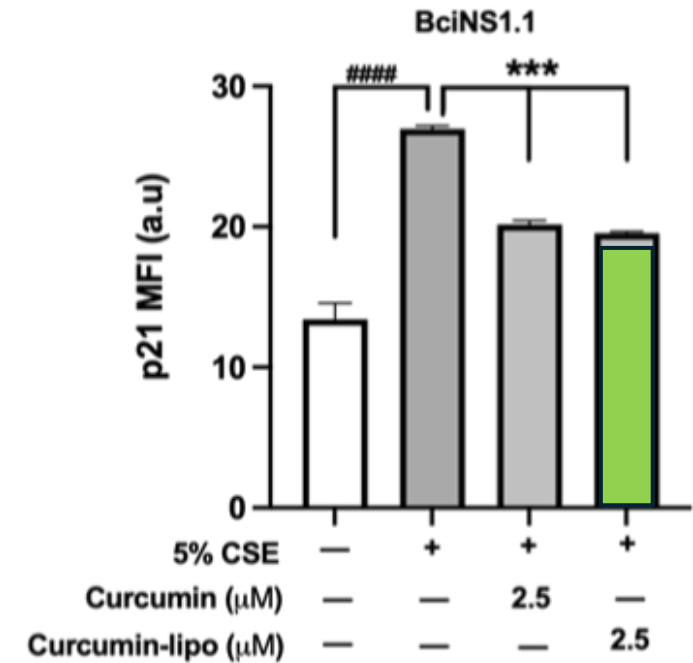
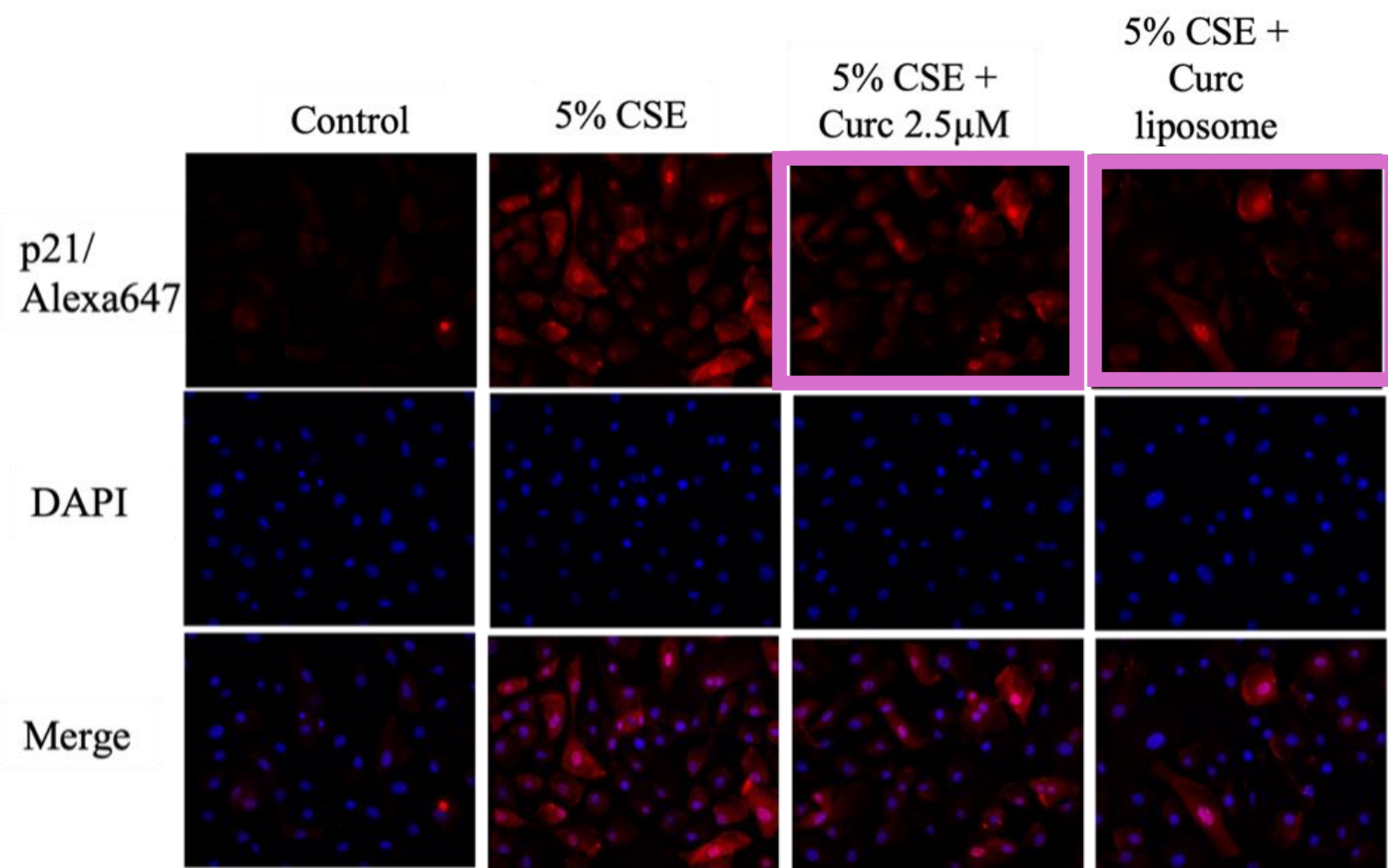
Cell Viability assay and X-gal staining



p16 staining

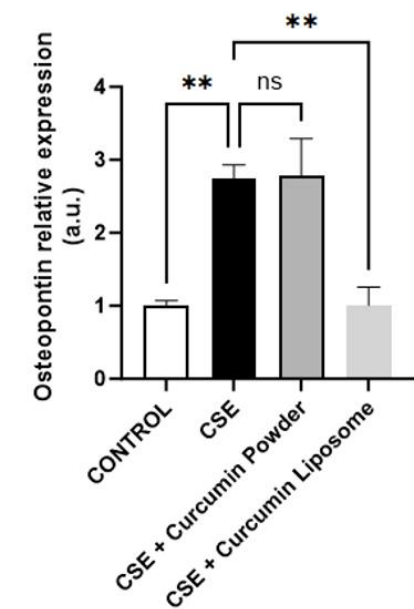


p21 Staining

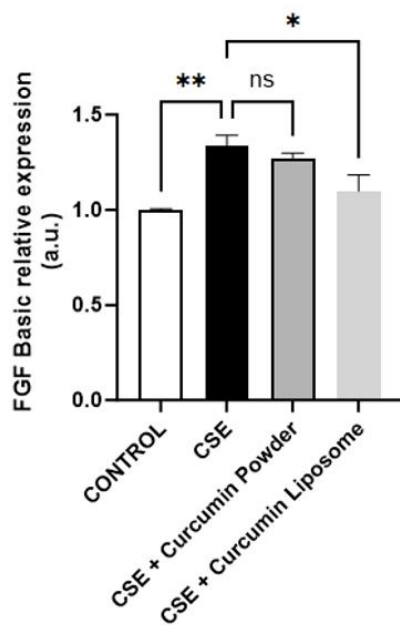


Protein array

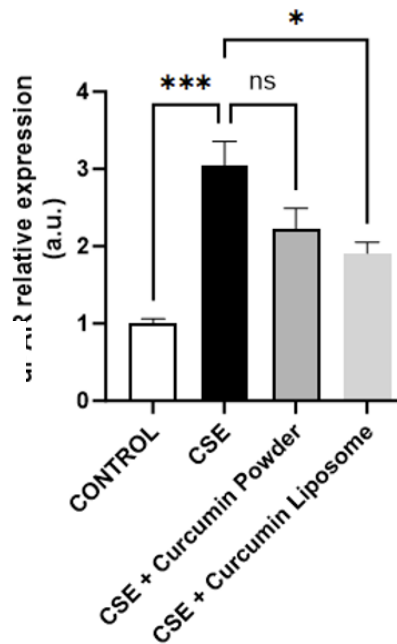
A



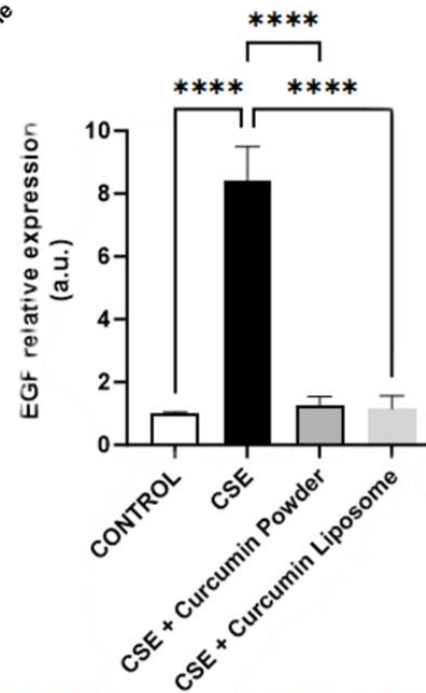
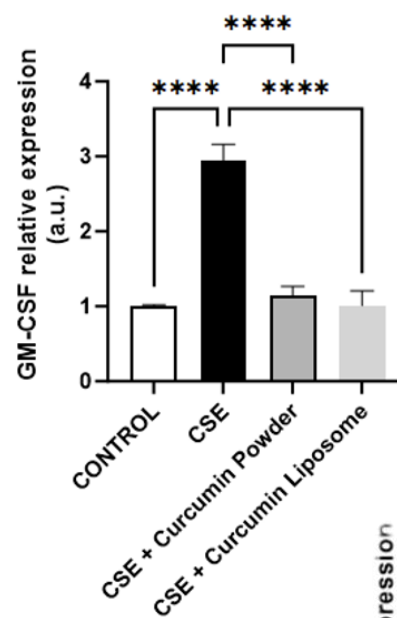
B



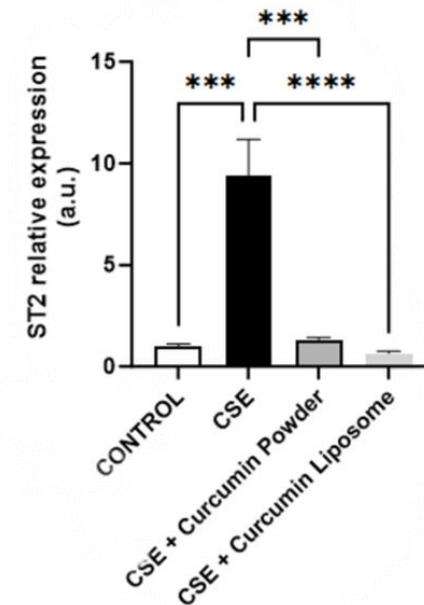
C



D



F



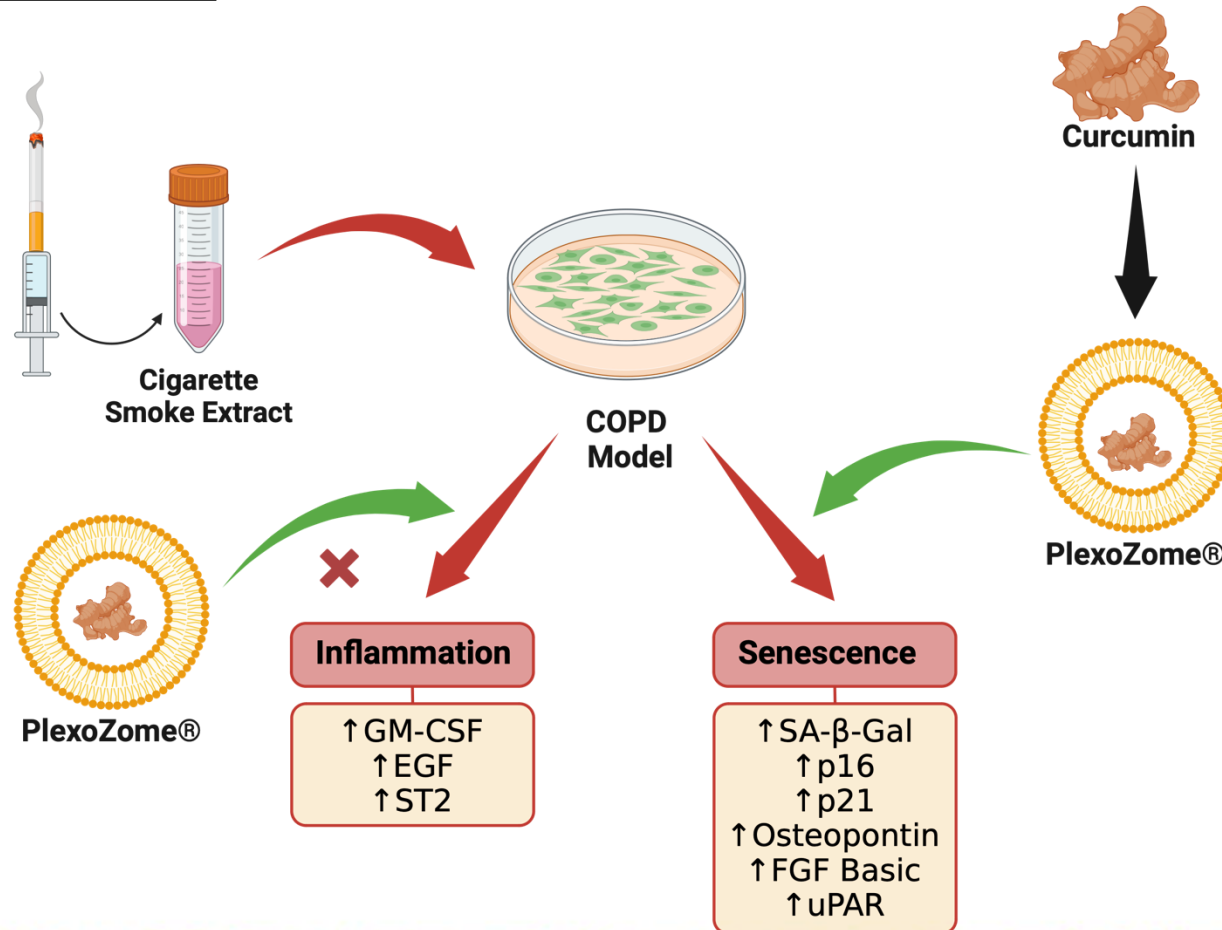
Conclusion



Research article • Open access Under a Creative Commons [license](#) [Get rights and content](#)

Liposomal curcumin inhibits cigarette smoke induced senescence and inflammation in human bronchial epithelial cells

Sofia Kokkinis^{a b c}, Gabriele De Rubis^{a b}, Keshav Raj Paudel^d  , Vyoma K. Patel^{a b e}, Stewart Yeung^{a b}, Victoria Jessamine^{a b}, Ronan MacLoughlin^{f g h}, Philip M. Hansbro^d, Brian Oliver^{i j}, Kamal Dua^{a b}   [Show more](#) 



Acknowledgments

- Kamal Dua
- Keshav Raj Paudel
- Brian Oliver
- Gabriele De Rubis
- Stewart Yeung
- Adam Haysom-McDowell
- Hannah Lee
- Prisca Pakan
- Mangesh Kulkarni
- Jessica Datsyuk
- Aaron Bennett

