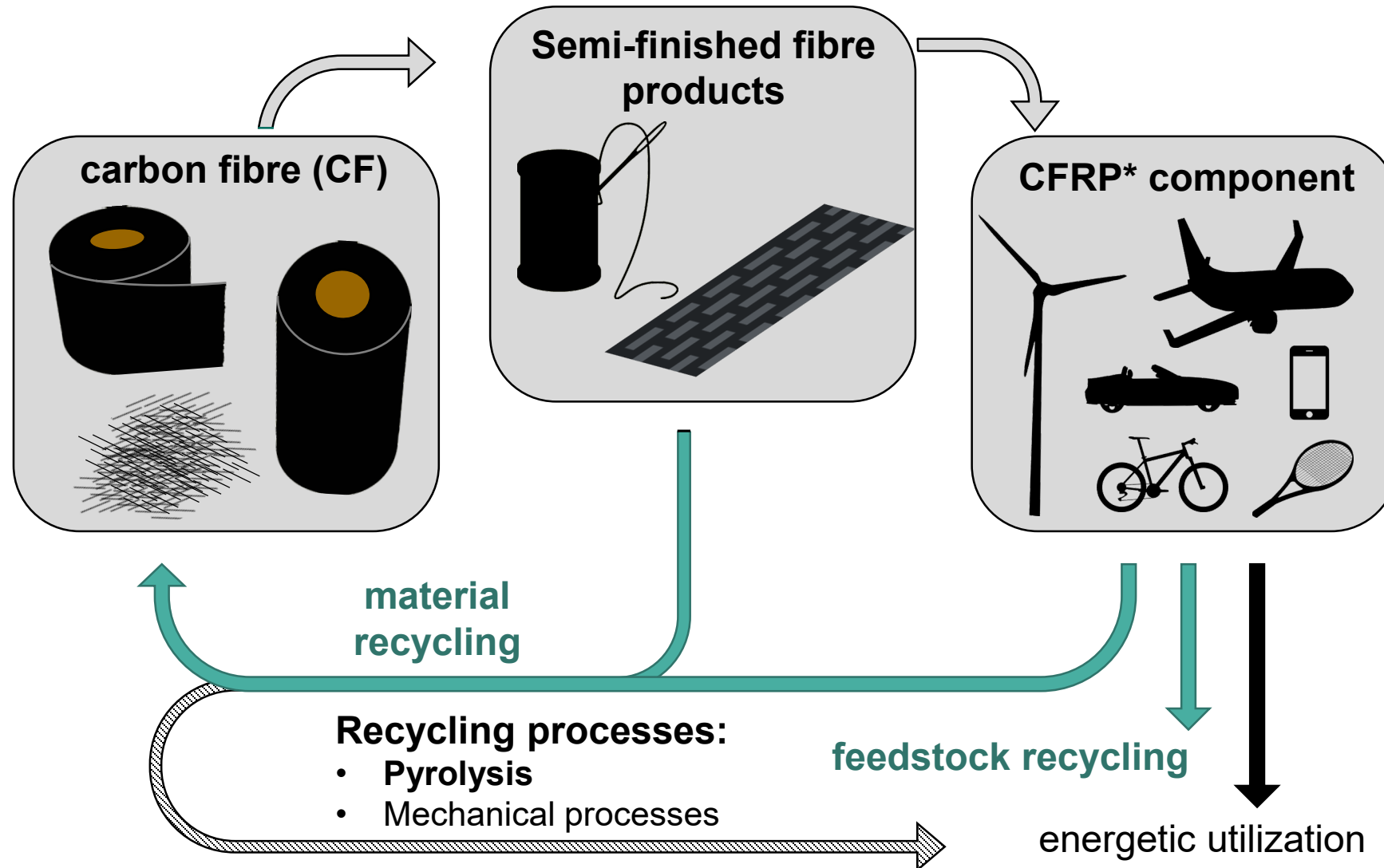


Characterisation of inhalable aerosols from carbon fibres

S. Mülhopt, M. Hauser, M. Wexler, J. Mahl, W. Baumann, S. Diabaté, S. Fritsch-Decker, C. Weiss, A. Friesen, M. Hufnagel, A. Hartwig, B. Gutmann, C. Schlager, T. Krebs, A.-K. Goßmann, F. Weis, and D. Stapf



Life cycle of carbon fibres



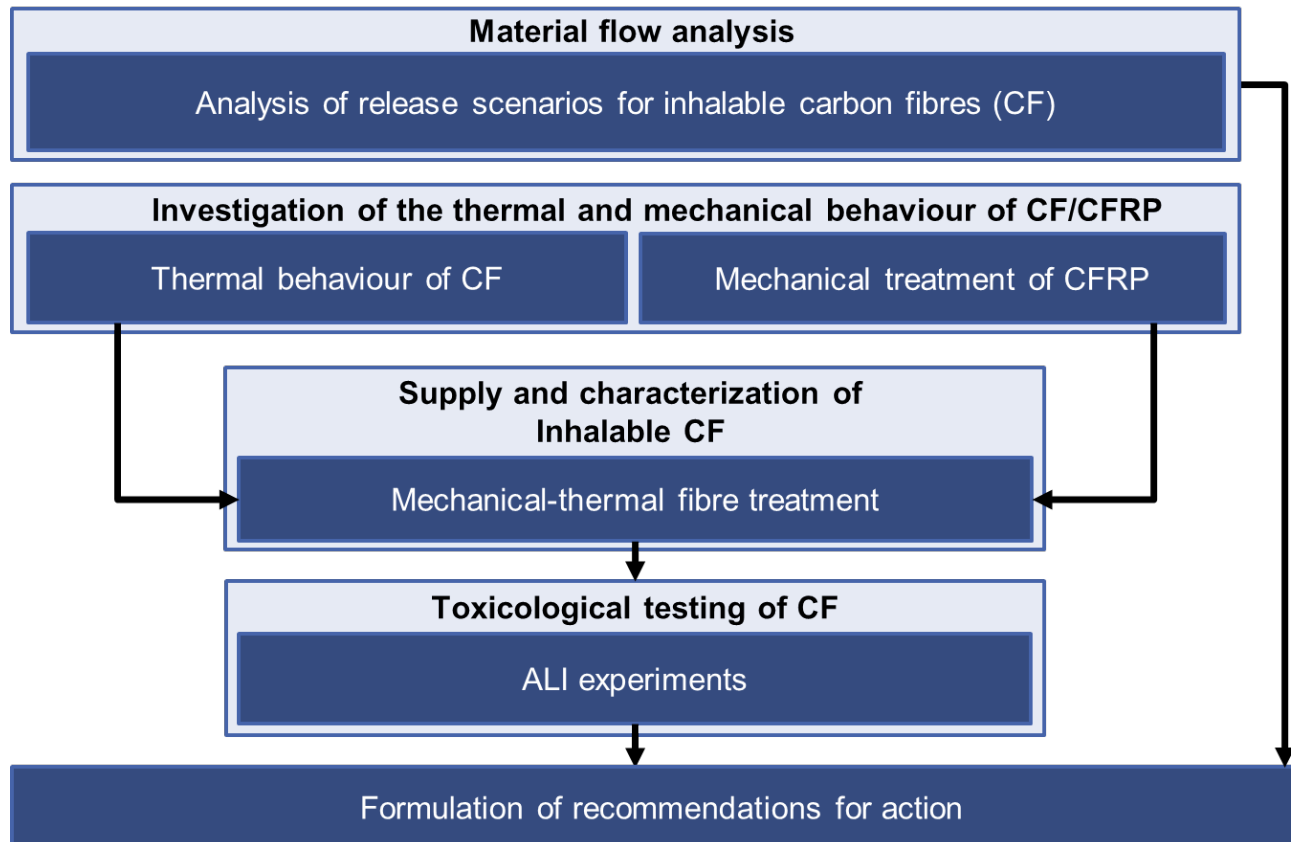
Processing of CF/CFRP

includes:

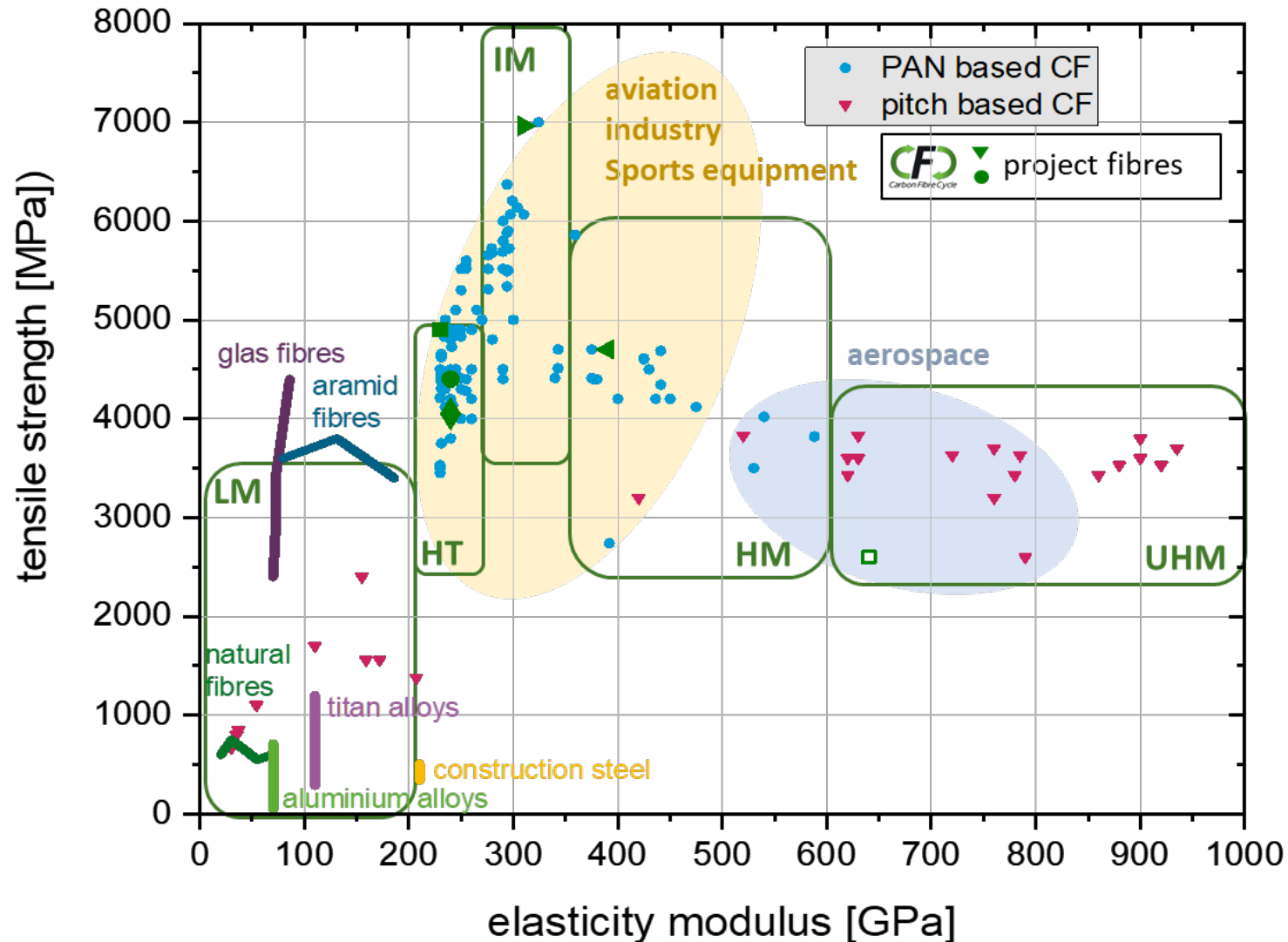
- Mechanical processes like
 - Cutting
 - Sawing
 - Grinding
 - ...
- Thermal processes like
 - Energetic disassembly
 - Pyrolysis
 - ...

→ Change of properties possible
→ Release of fibres and fibre fragments possible

*Carbon fibre reinforced polymer



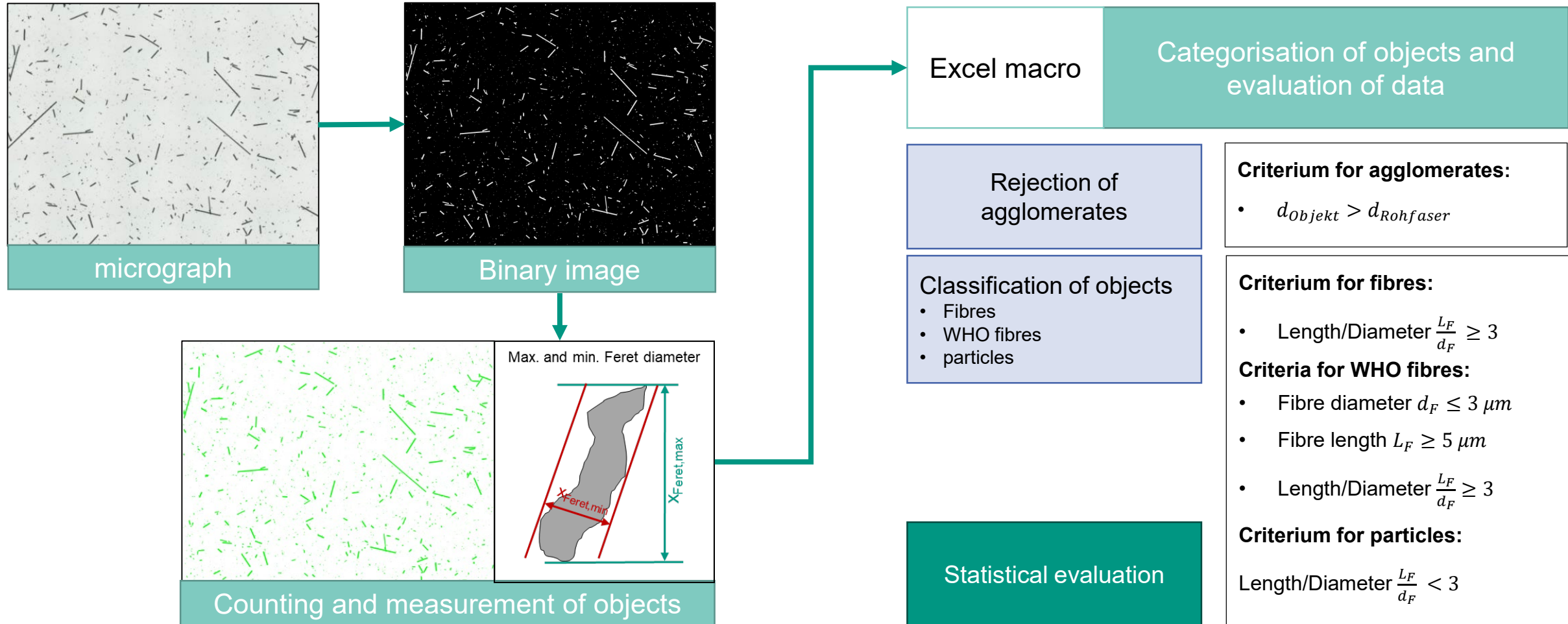
Carbon fibres



| | |
|-----|-----------------------|
| LM | Low Modulus |
| HT | High Tensile Strength |
| IM | Intermediate Modulus |
| HM | High Modulus |
| UHM | Ultra High Modulus |

Characterisation of CF and CF fragments

Image analysis of micrographs



For detailed information please visit Poster F.5


CF aerosols for toxicological testing



Thermal treatment



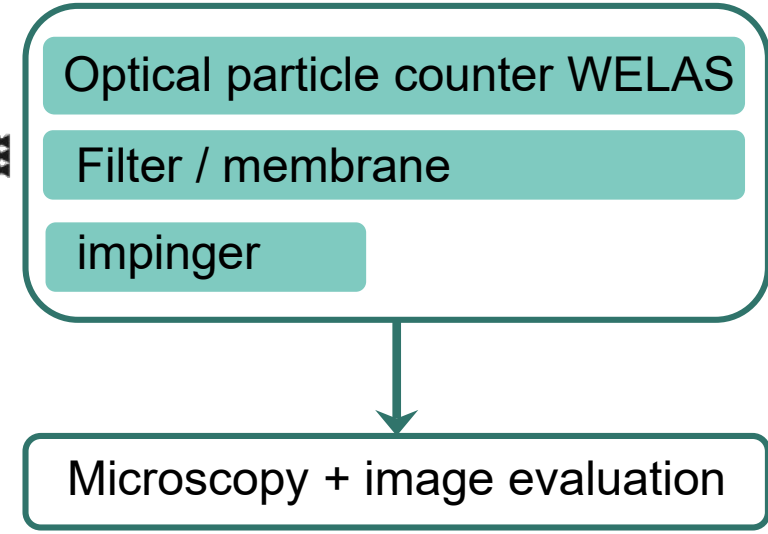
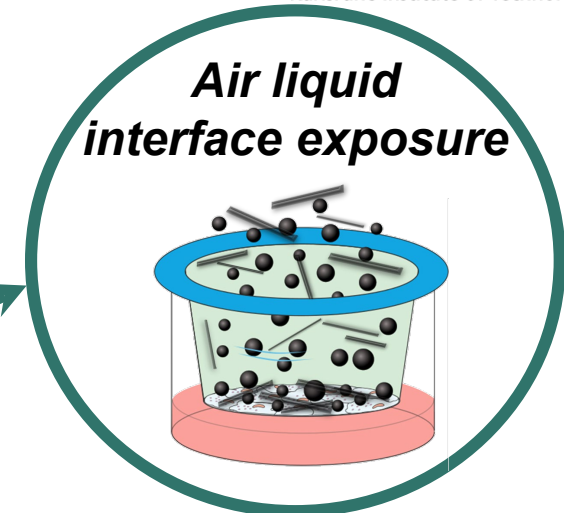
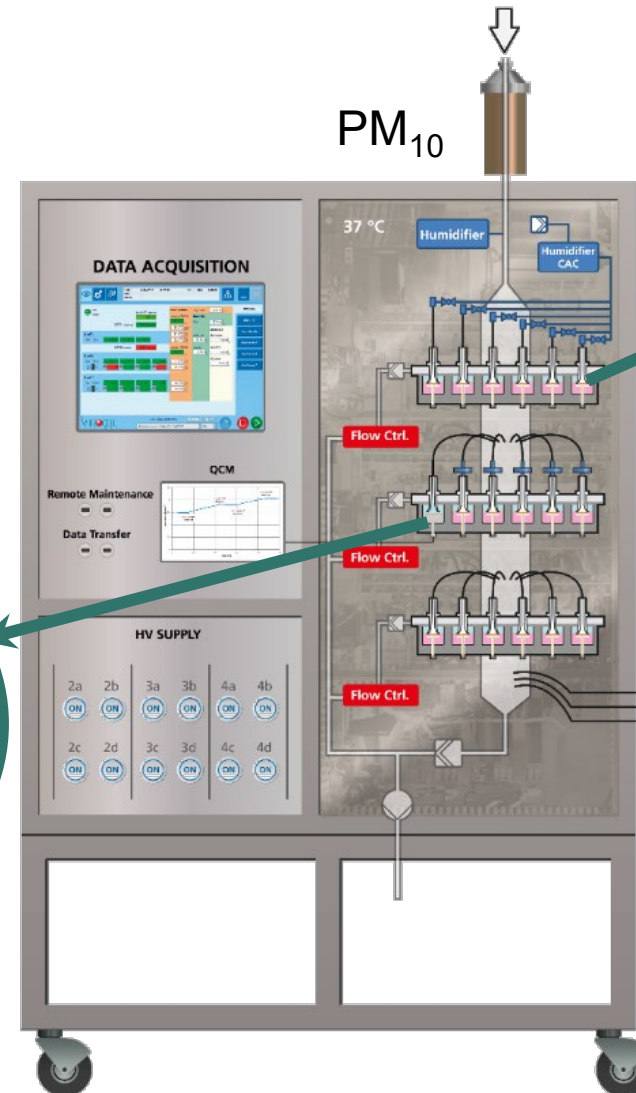
Mechanical treatment



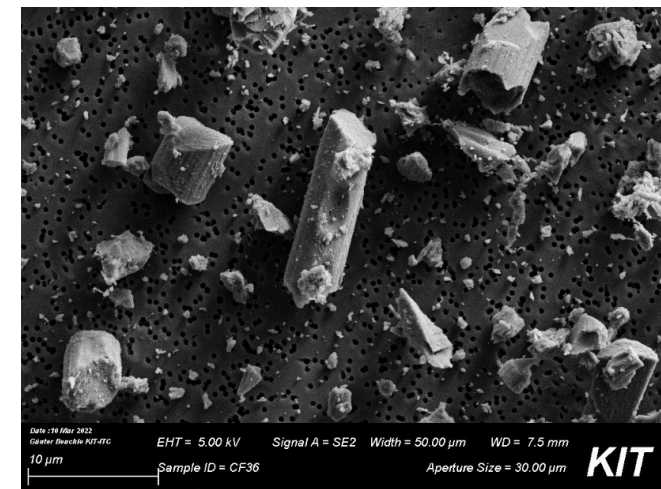
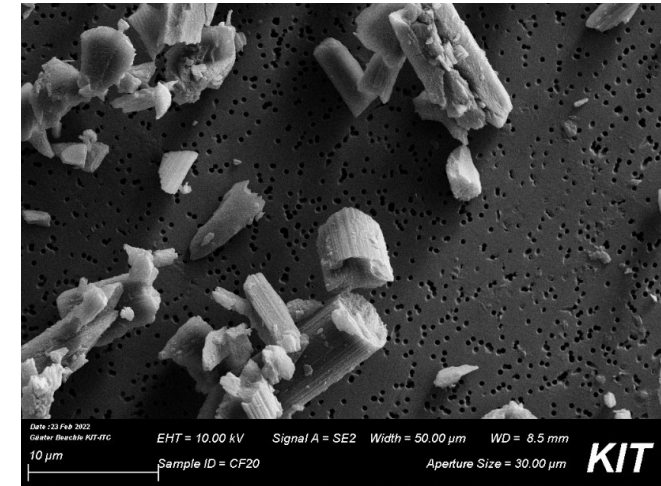
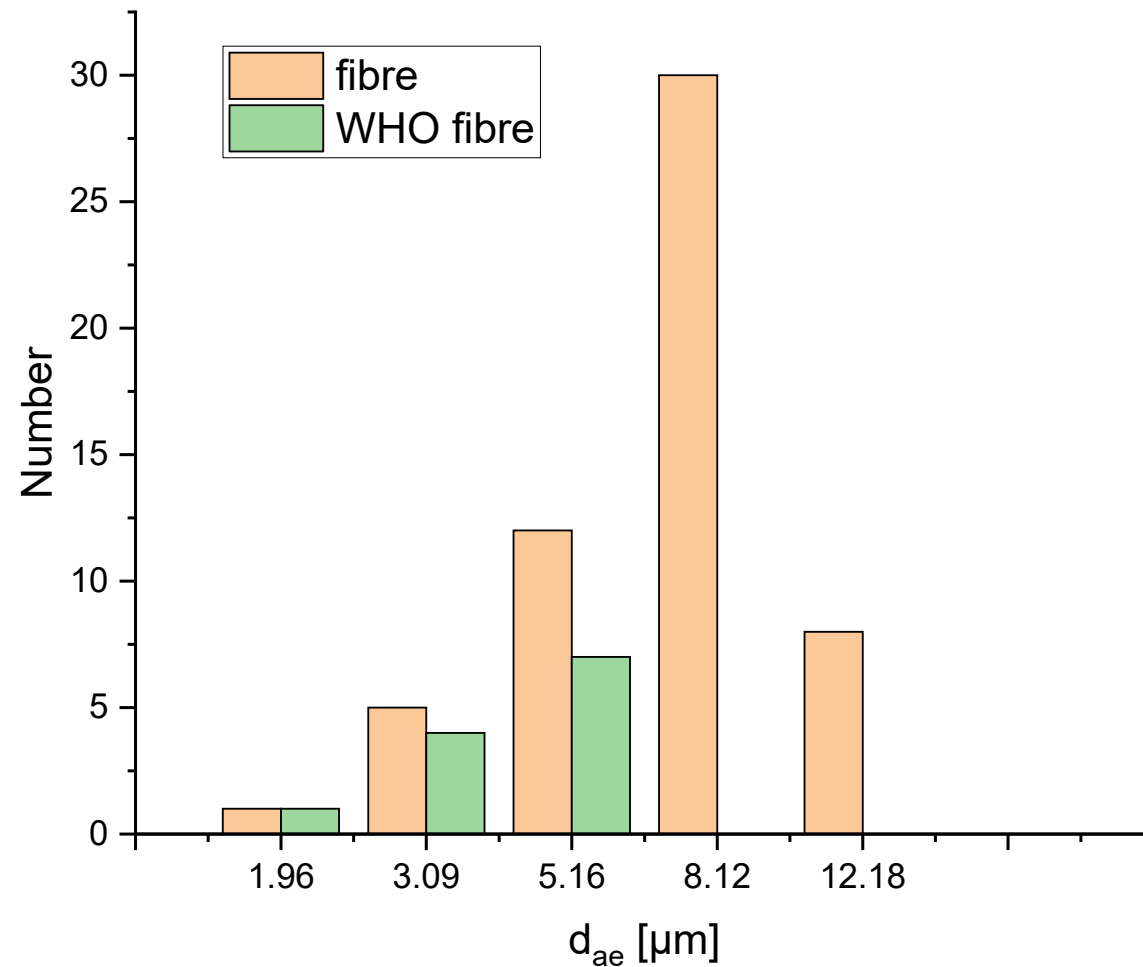
Aerosol generation



Online dose determination



CF deposited in the exposure system



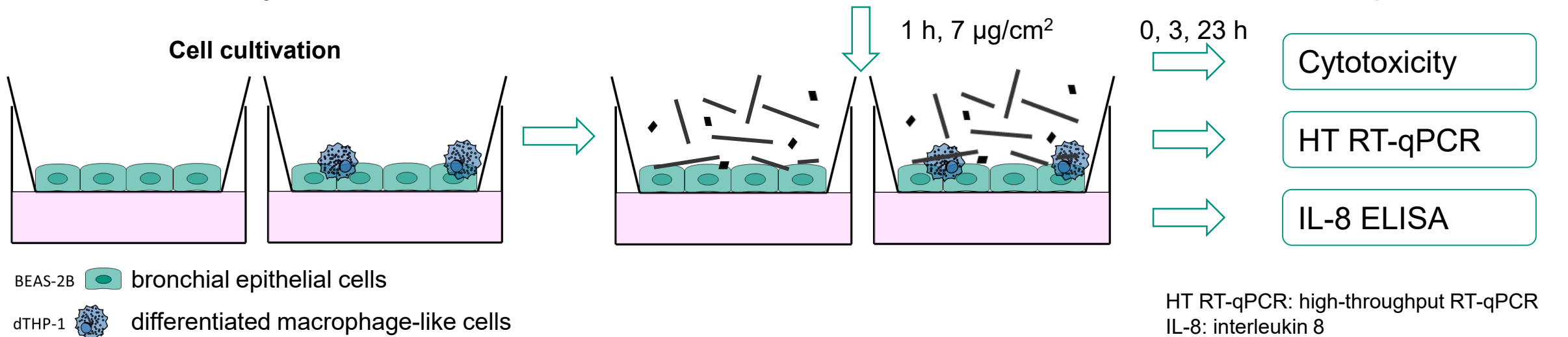
Exposure of pulmonary cell culture models to pre-treated carbon fibres (CF)



PAN based CF pre treatment

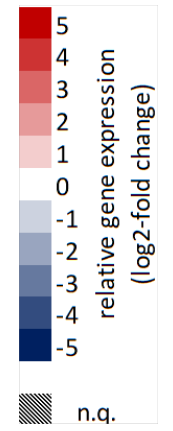
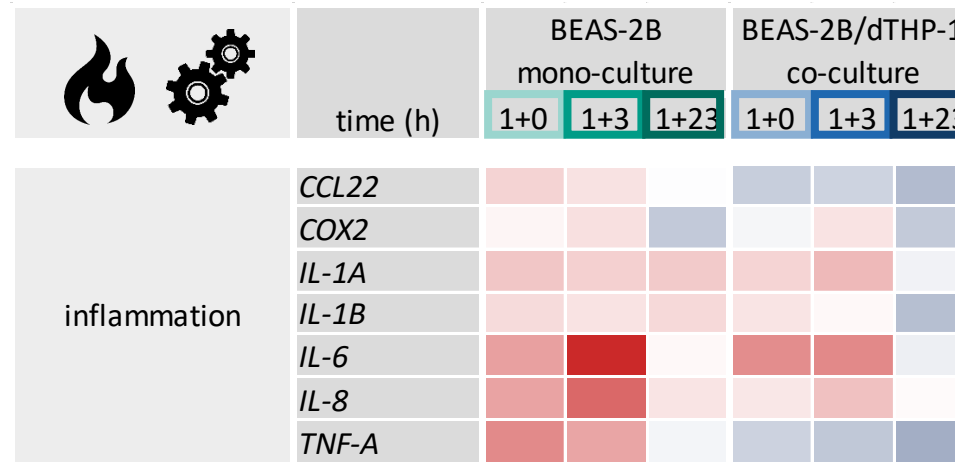
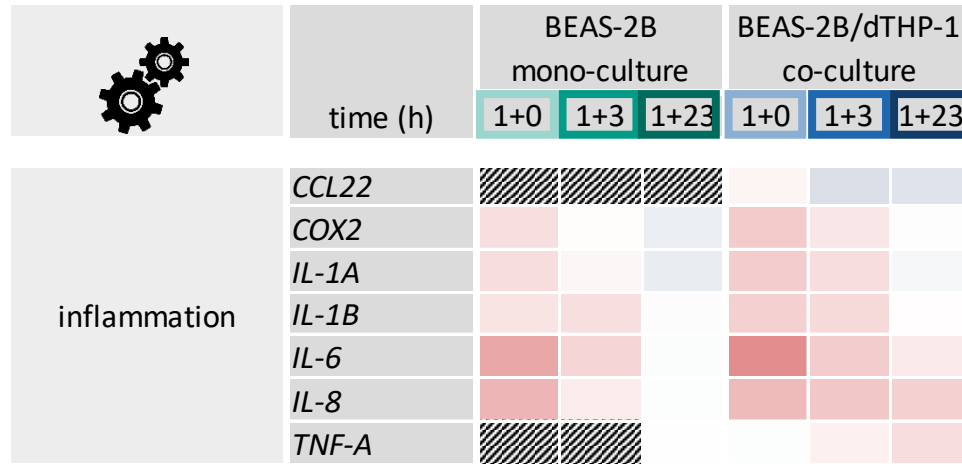


Air liquid interface exposure

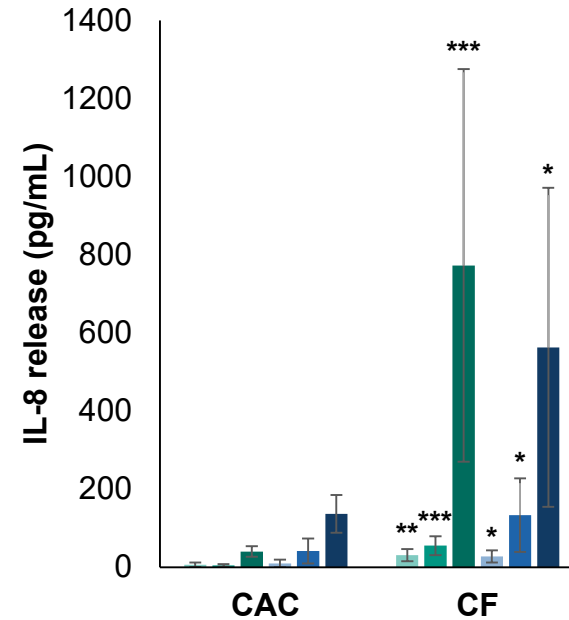
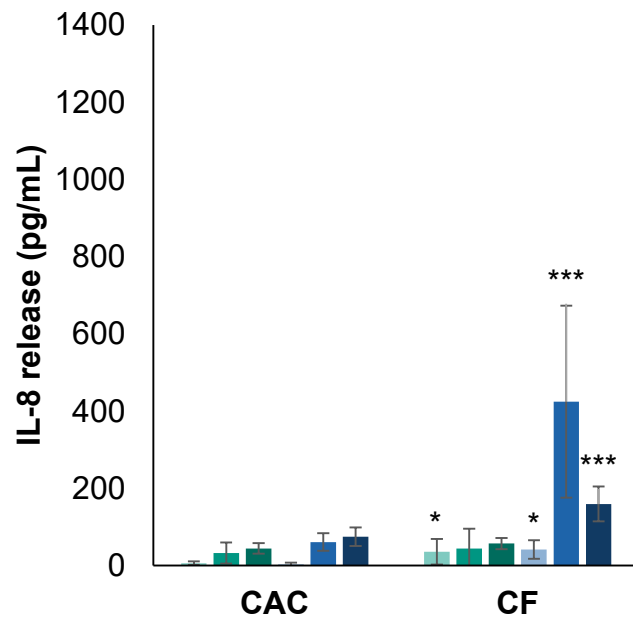


CF cause inflammation in dependence pre-treatment

Gene expression

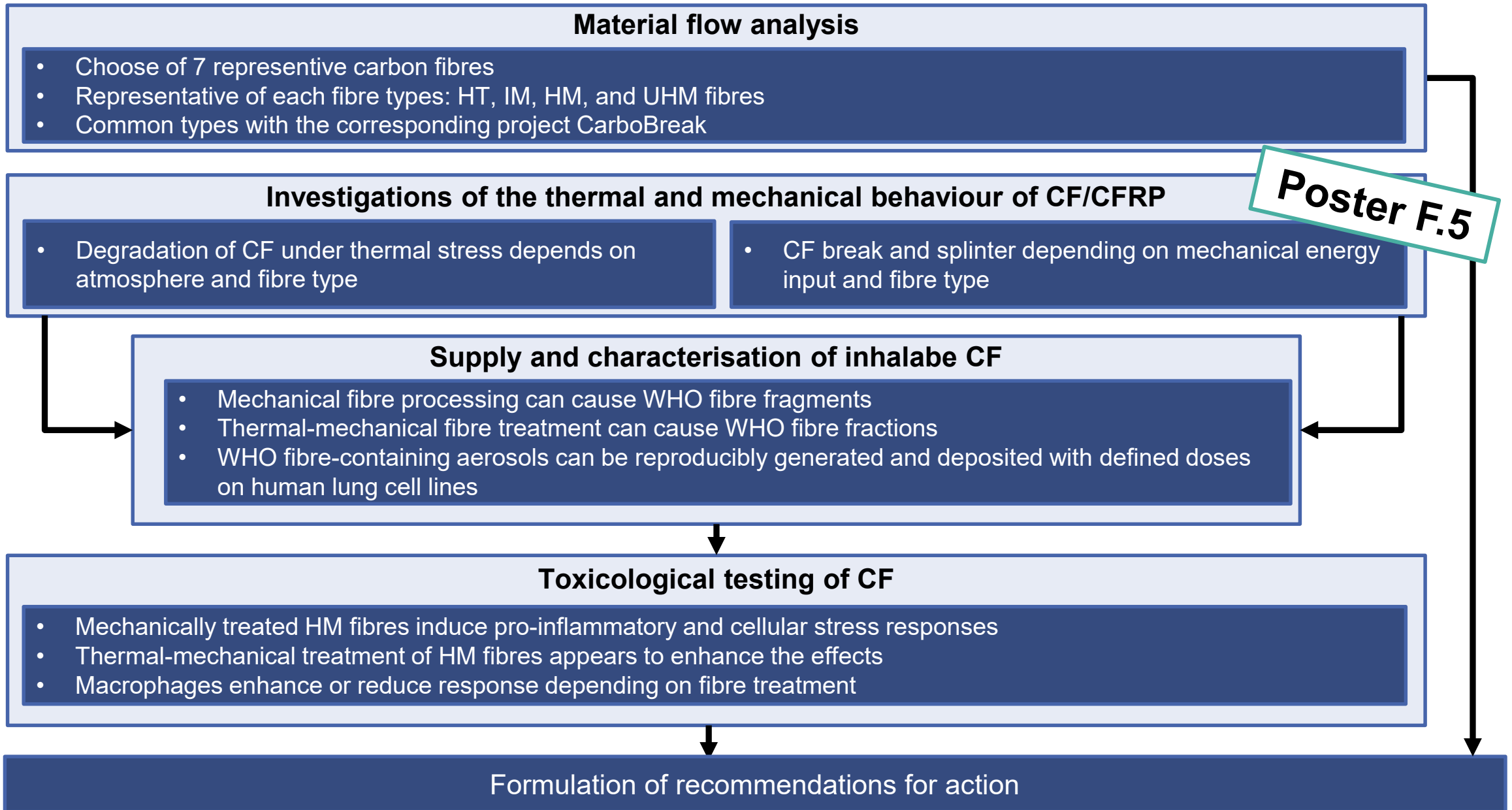


Protein release



*/**/***: significant changes (p<0.05/0.01/0.005)

CAC: clean air control
CF: carbon fibre
IL-8: interleukin 8
n.q.: not quantifiable





Questions ?

