



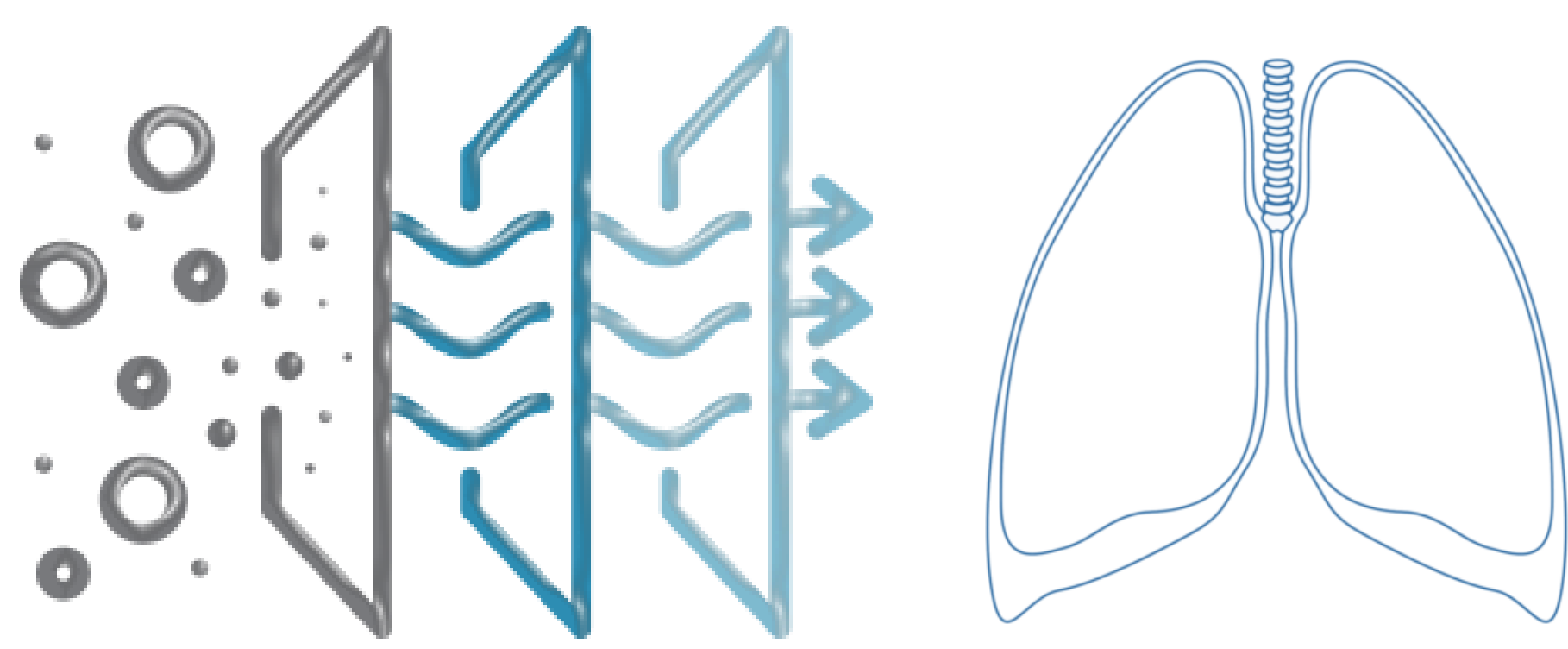
indoor air pollution control

2019 Bulletin @ Tsinghua University

<http://jmo-lab.net>

Having lunch together in Laofoye Restaurant, April 2019



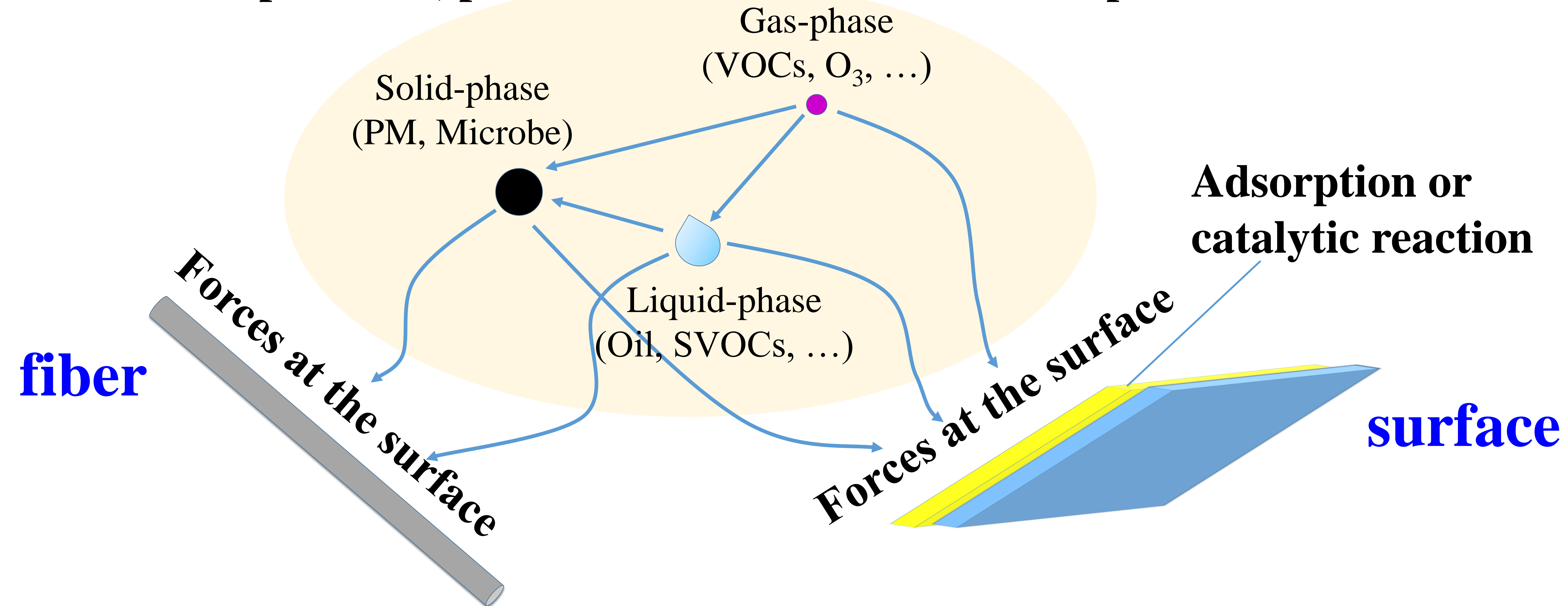


Researches Activities Funs

Scopes

- Indoor air pollution sampling, analysis and risk assessment for human health
- The heterogeneous interfacial mass transfer/reaction of air pollutants indoors
- Design and fabrication of air purification material/surface

transportation, partition and formation of indoor pollutants



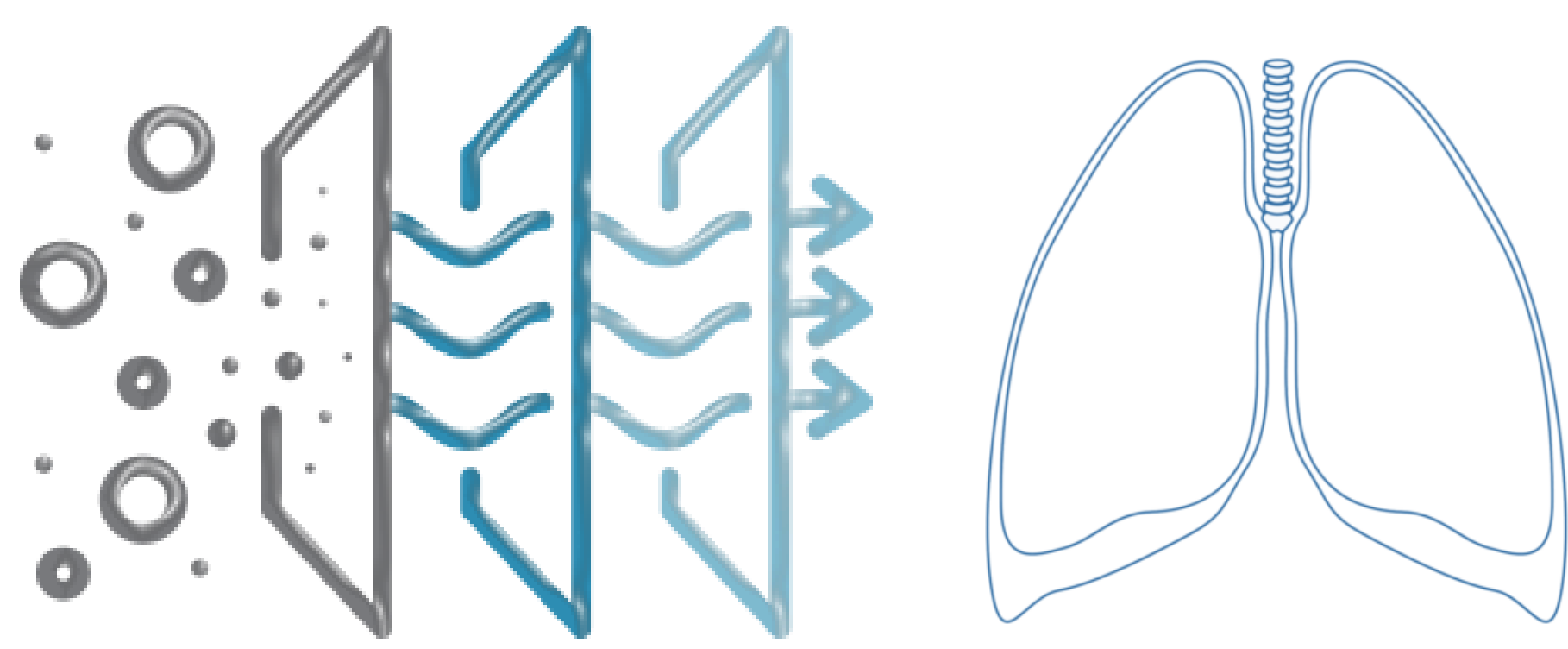
Low cost, low operating power materials

mechanical/electric forces, etc.

Enhancement: External field forces at interfaces

New design for air purification materials

New fabrication and coating methods of the materials

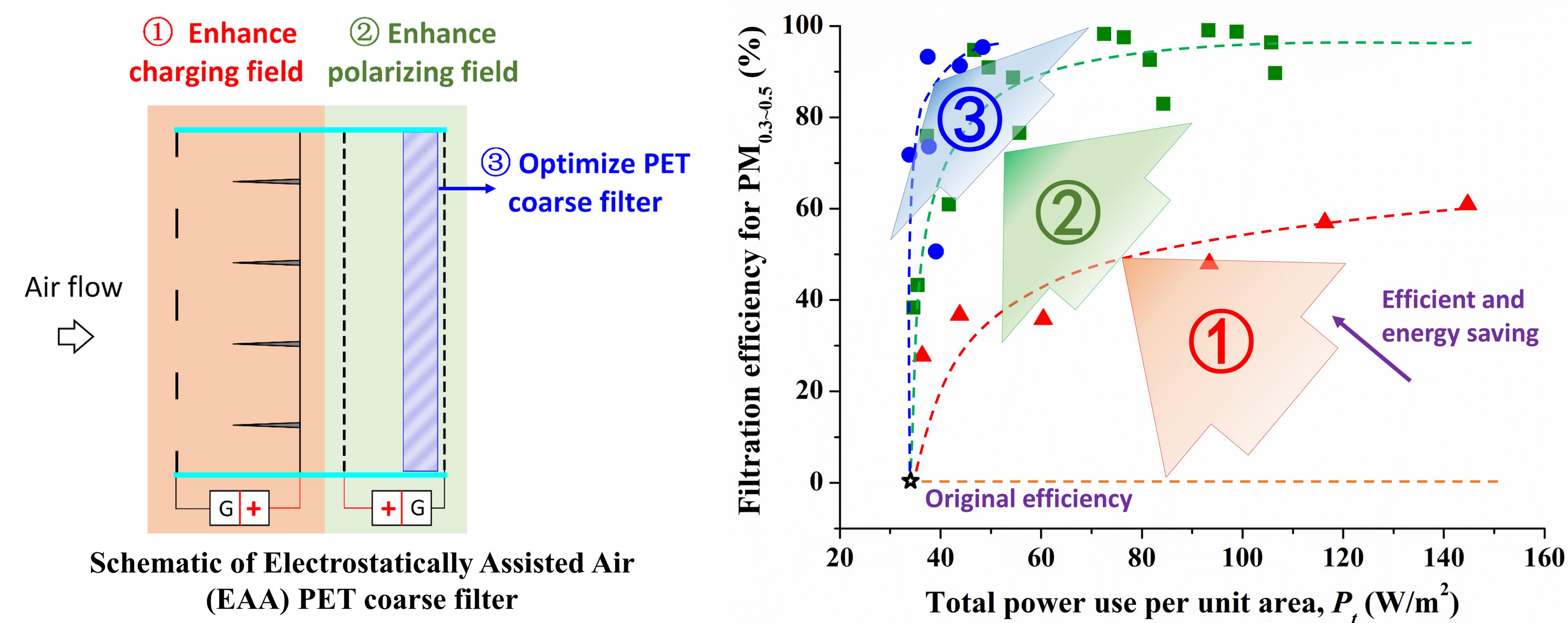


Researches Activities Funs

Electrostatically assisted air coarse filtration (EAA) by Enze Tian

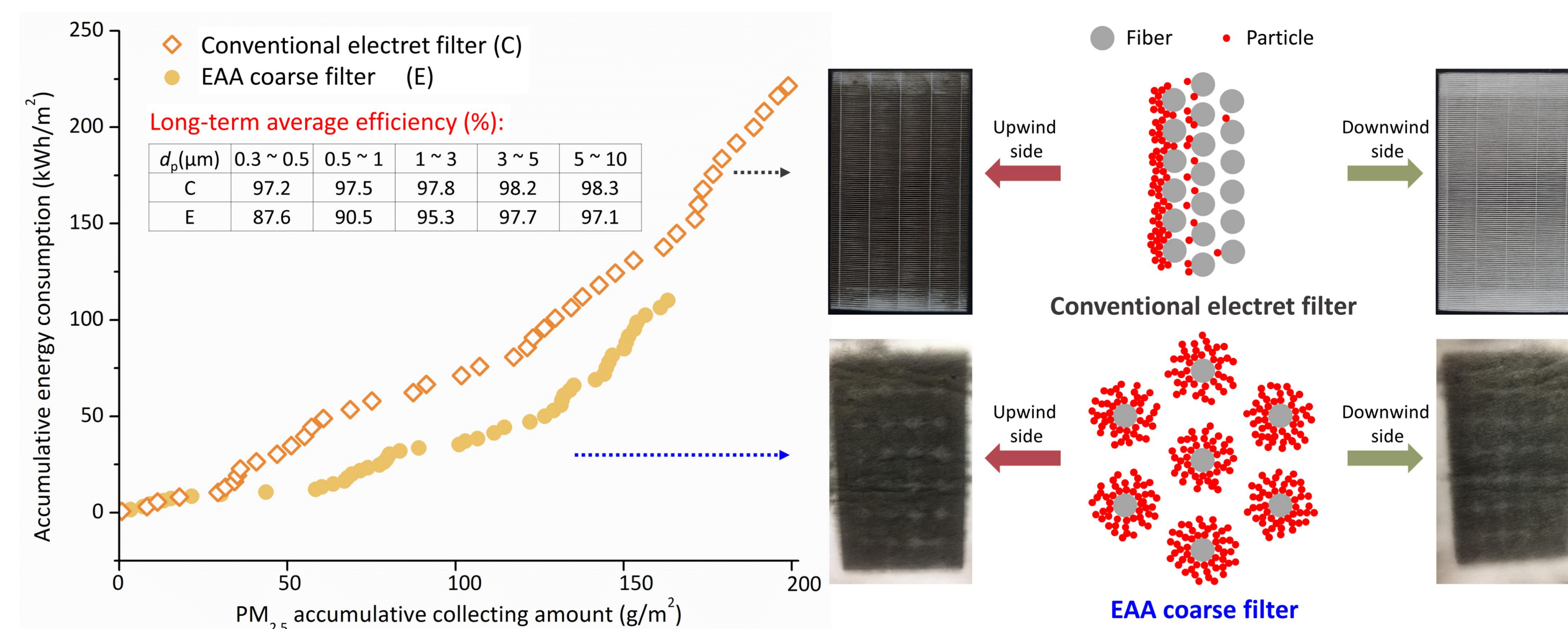
Enhanced the single-pass filtration efficiency for $PM_{0.3-0.5}$ of a coarse filter from 0.4% to 99% at 1.2 m/s face air velocity (v_{air}).

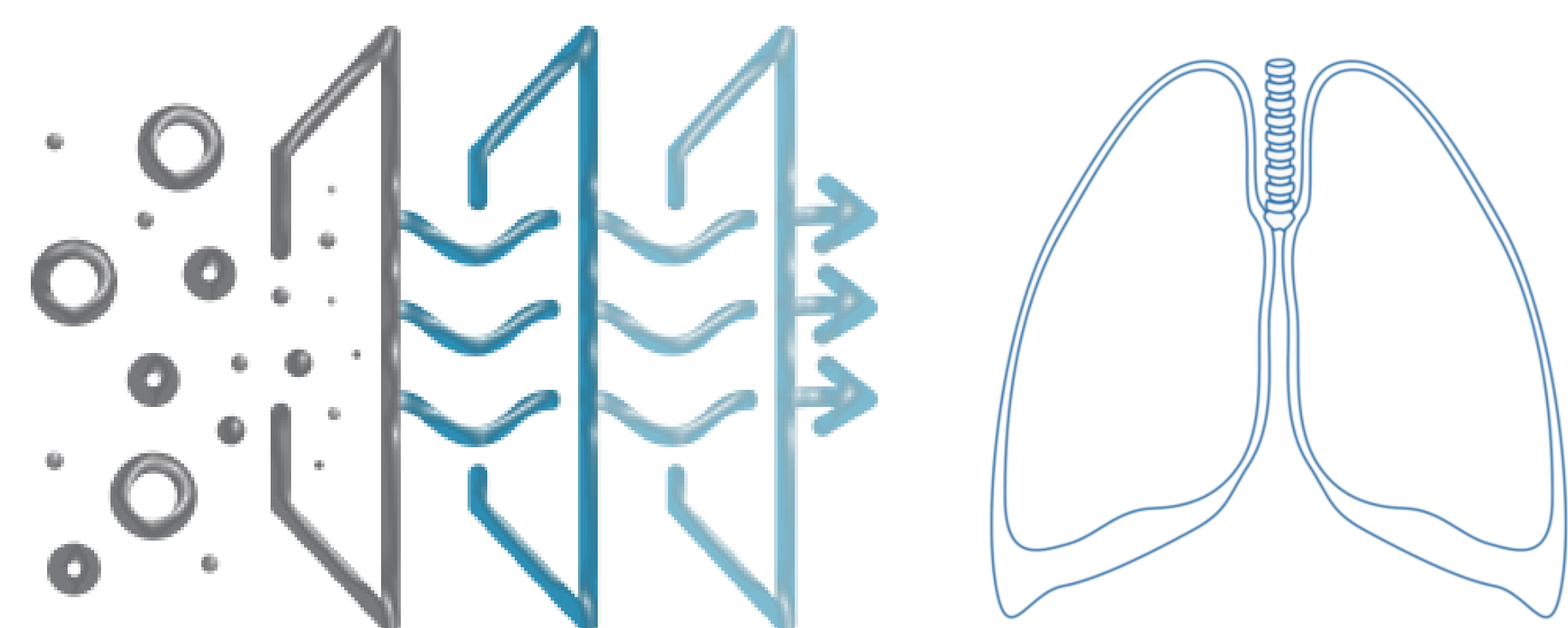
Enze Tian, Jinhan Mo*, Energy Build., 2019, 186: 276-283.



Long-term performance of an EAA filter for average $PM_{0.3\sim 0.5}$ filtration

Enze Tian, Yillun Gao, Jinhan Mo*, Build. Environ., 2019, 164: 106348.



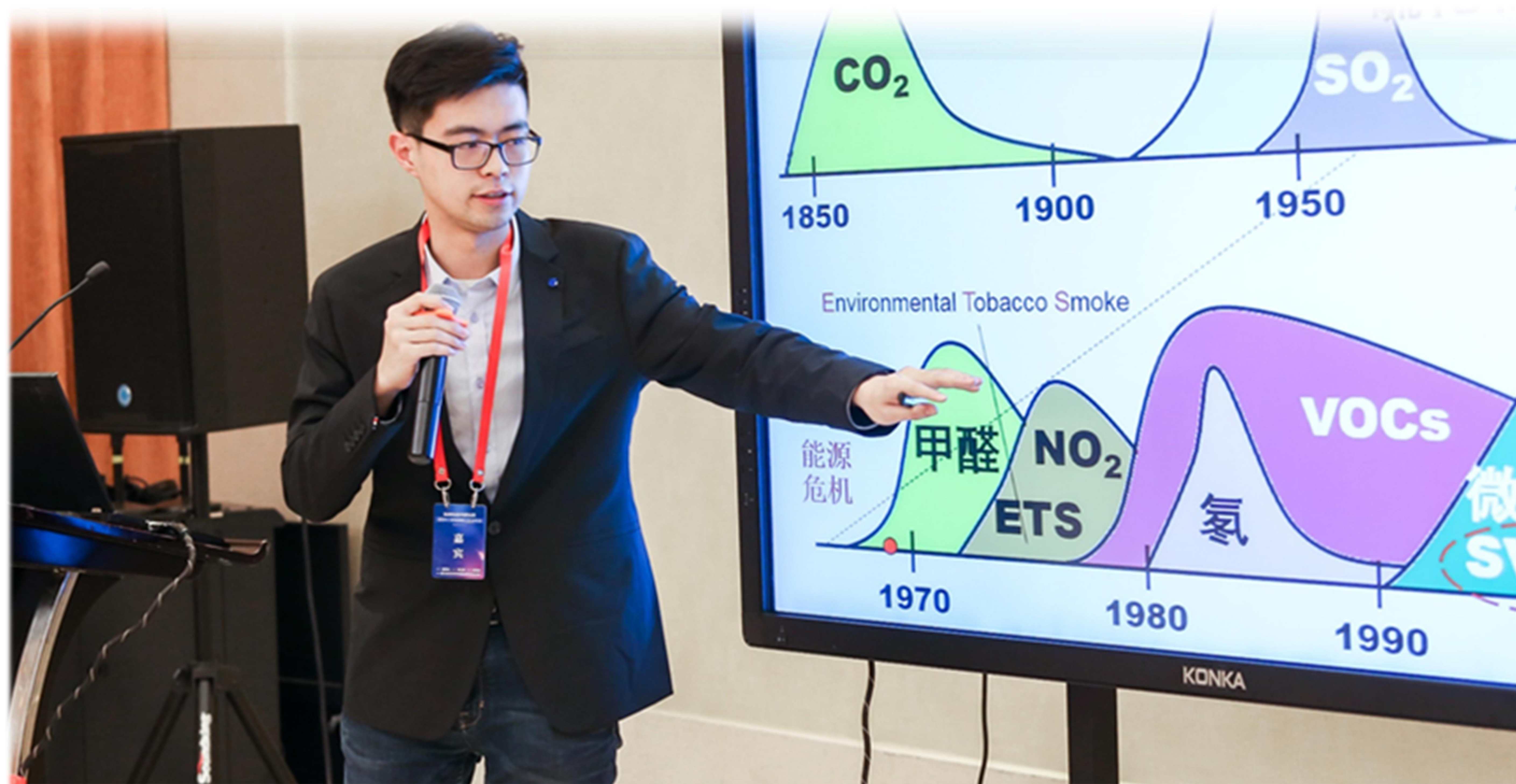


Researches Activities Funs

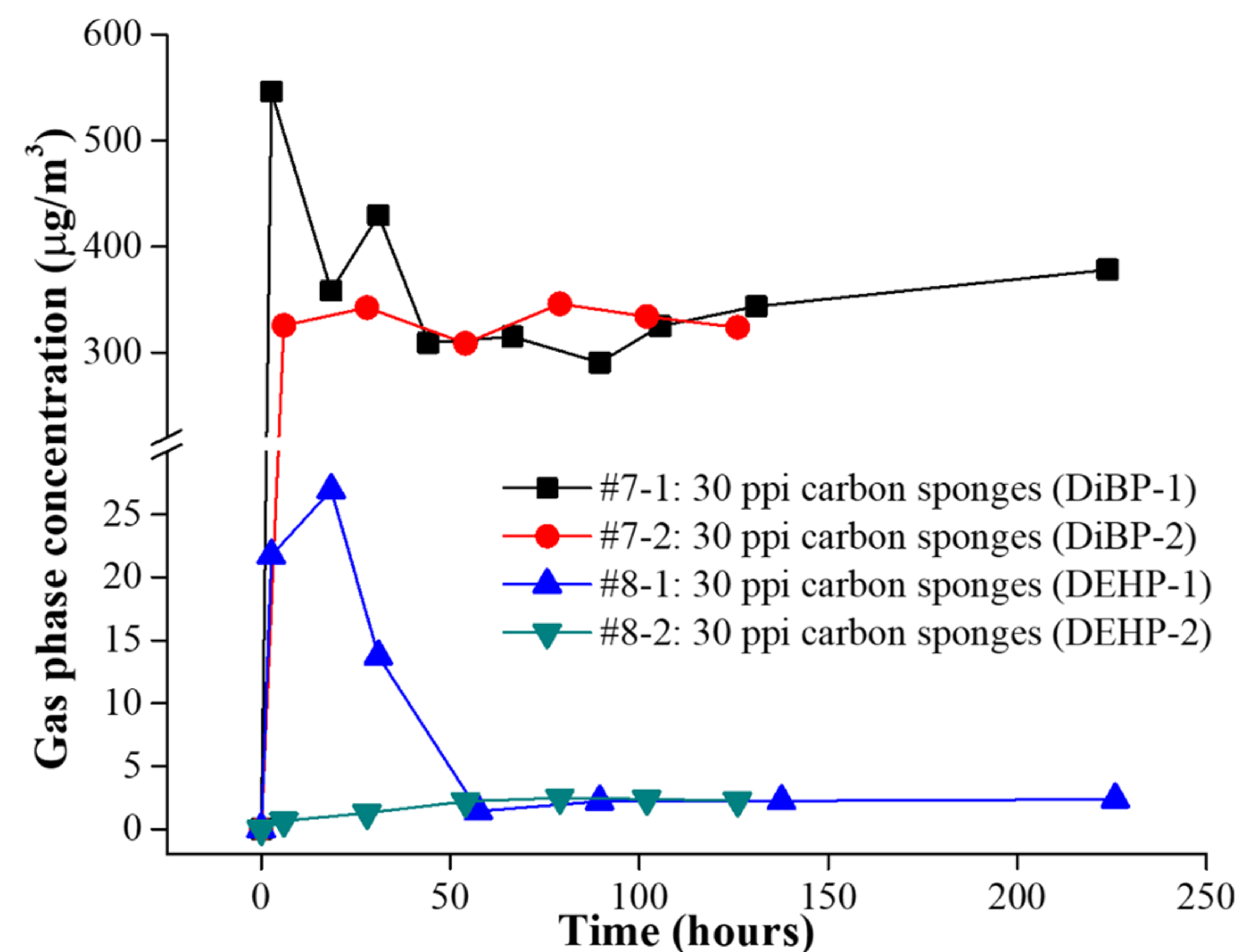
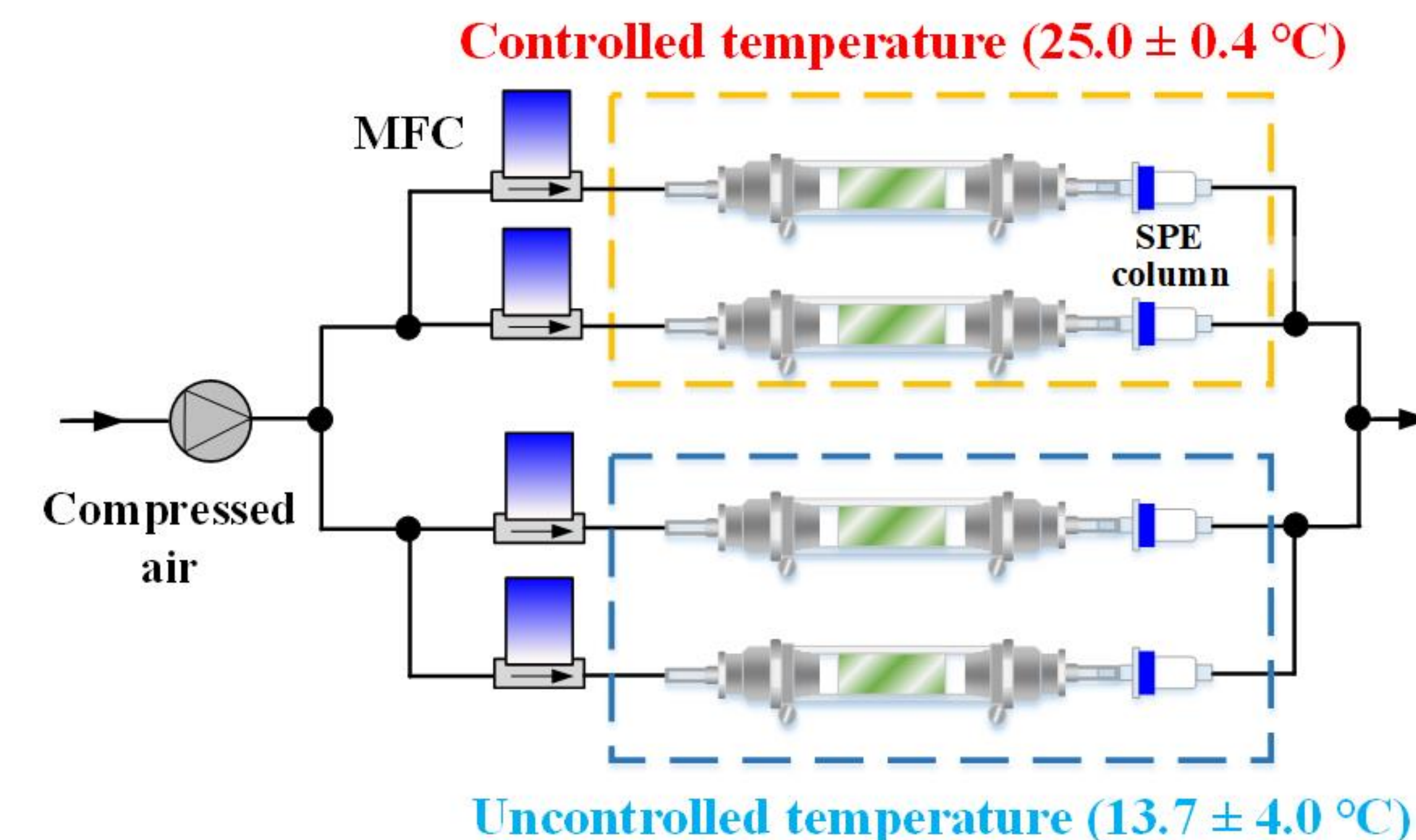
A method using porous media to deliver gas-phase phthalates rapidly and at a constant concentration, by Zhuo Chen

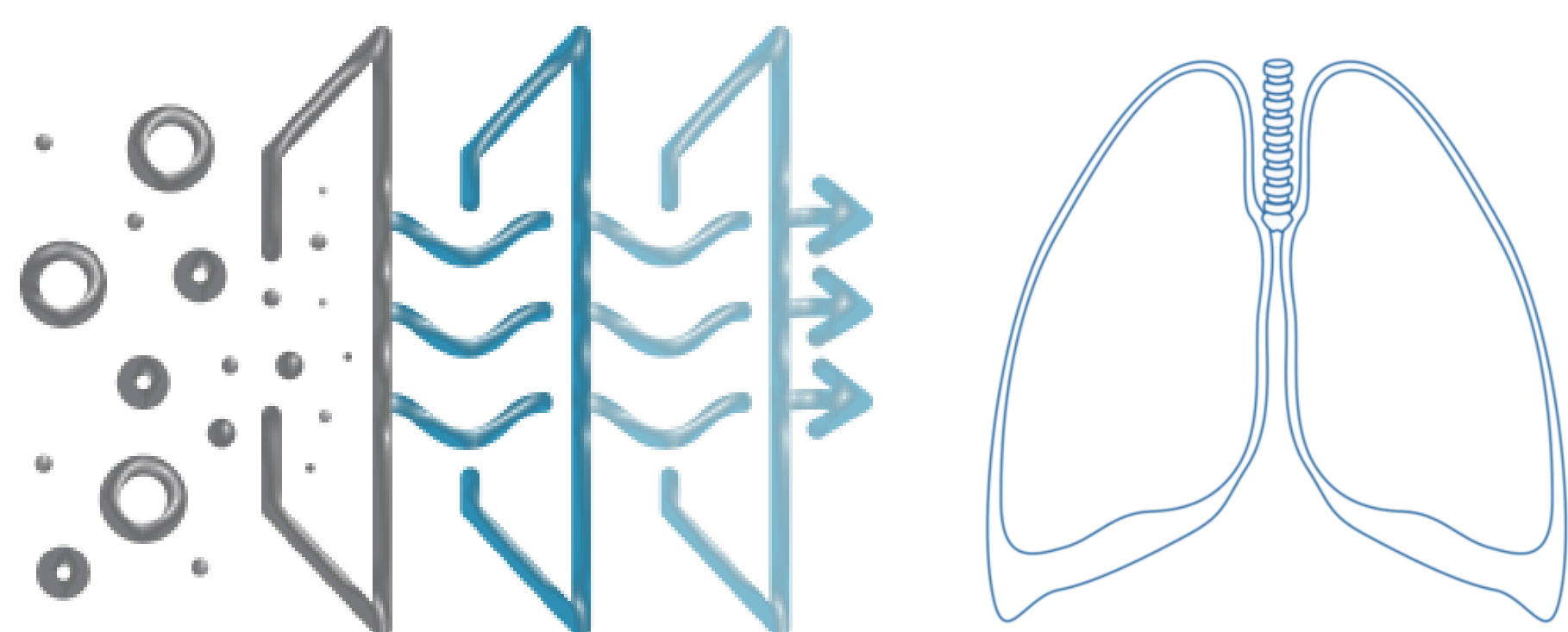
Zhuo Chen, Alireza Afshari, Jinhan Mo*, Environmental Pollution.

<https://doi.org/10.1016/j.envpol.2019.113823>



Zhuo Chen is giving a talk at the Annual Conference on Home Appliance Technology, China

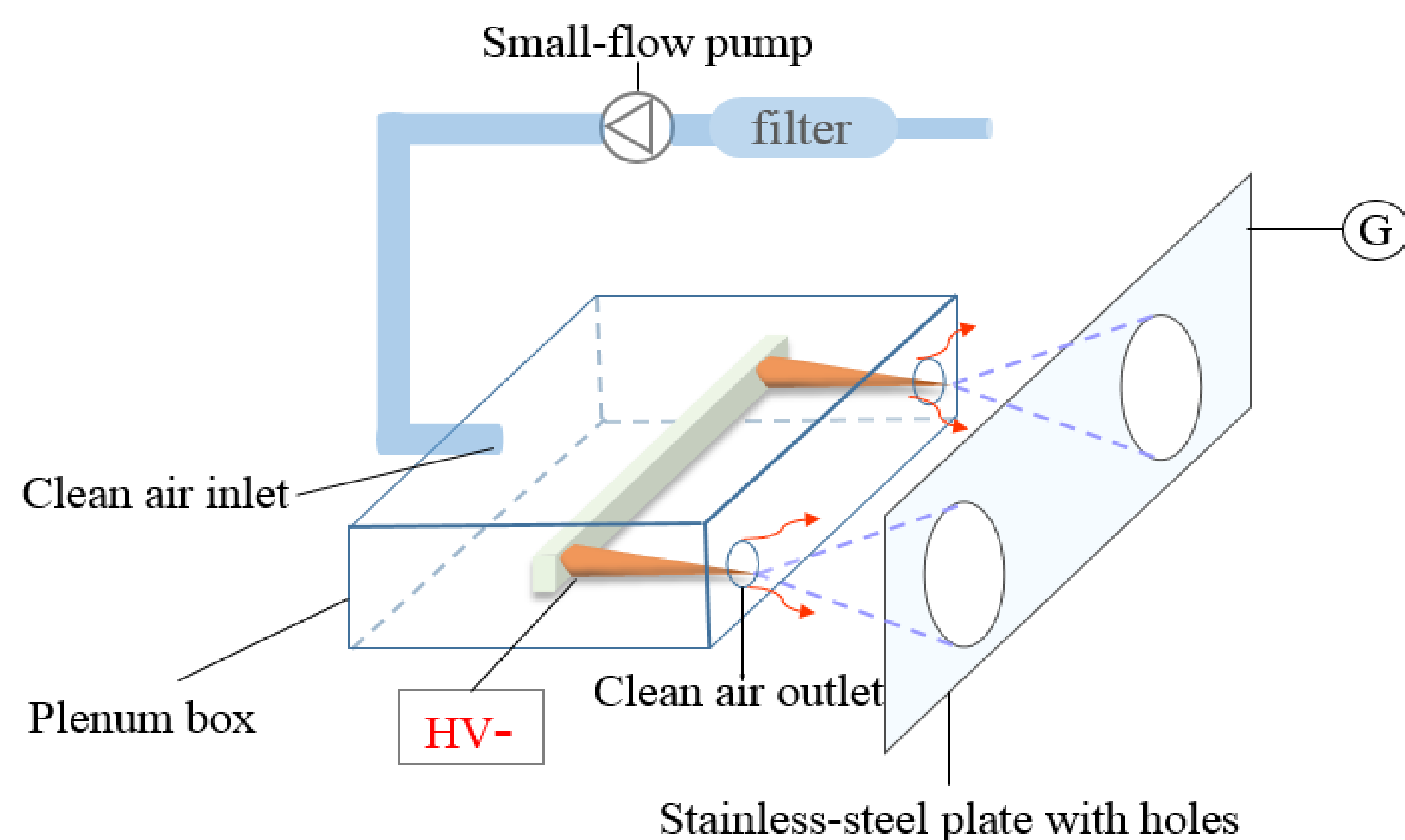




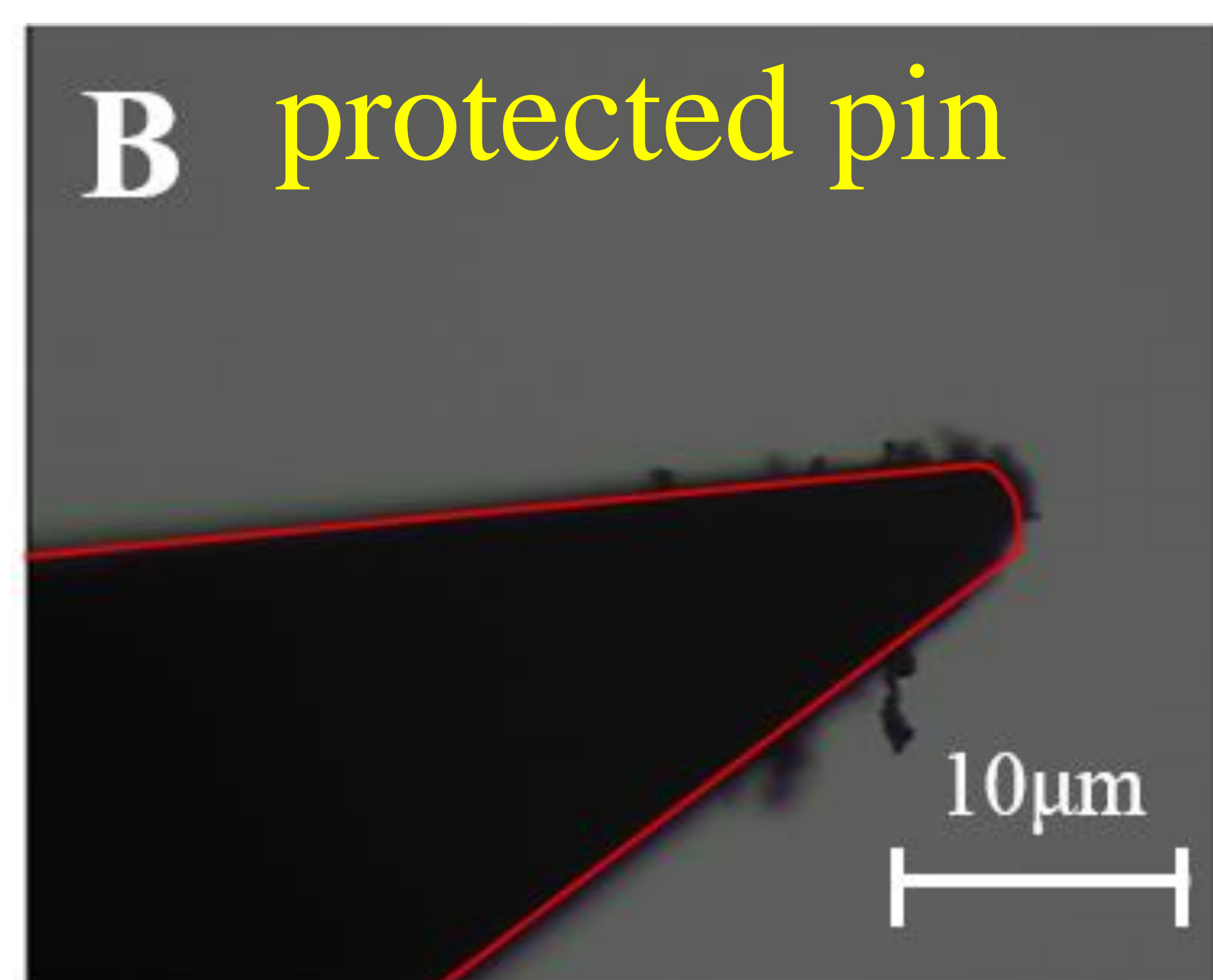
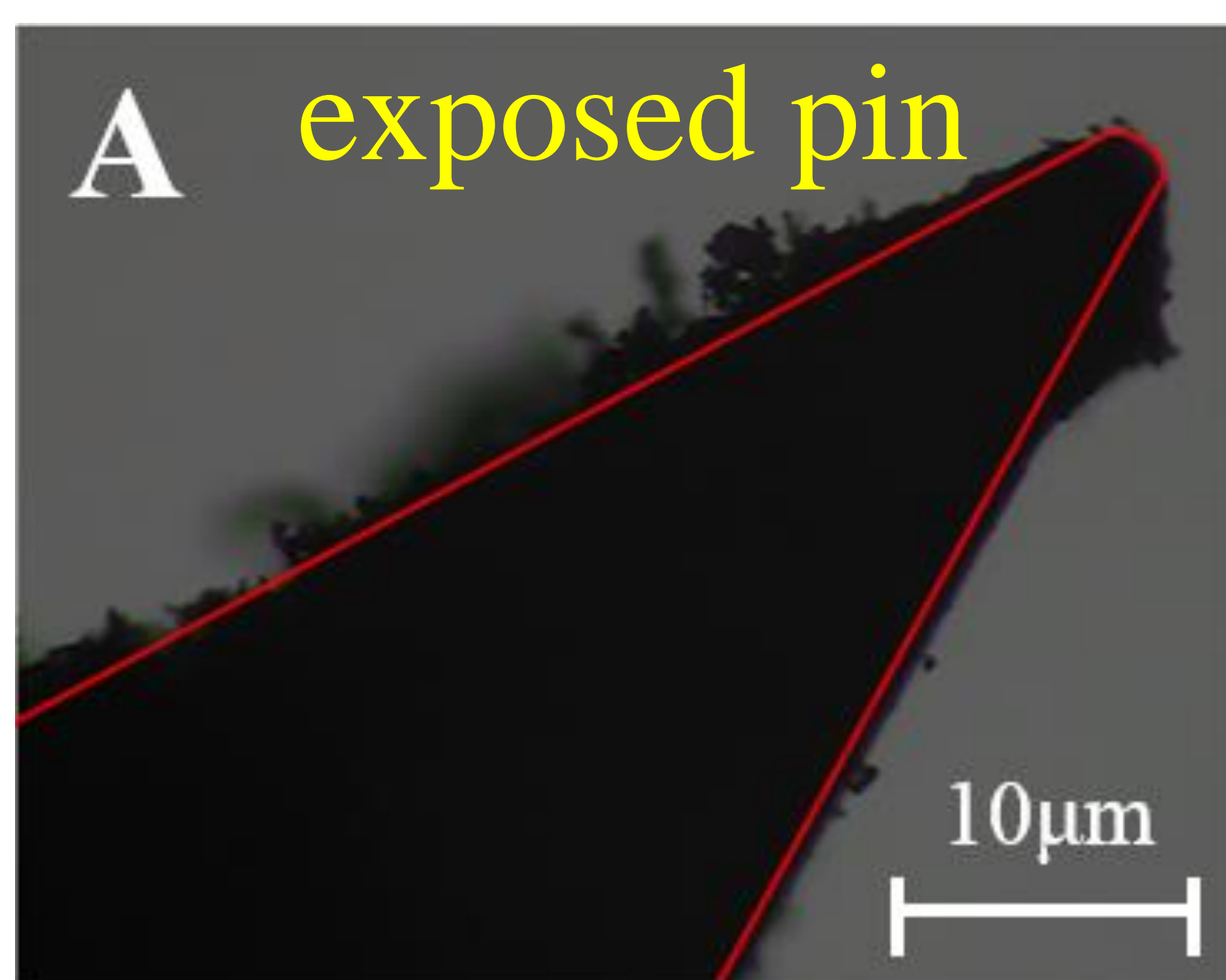
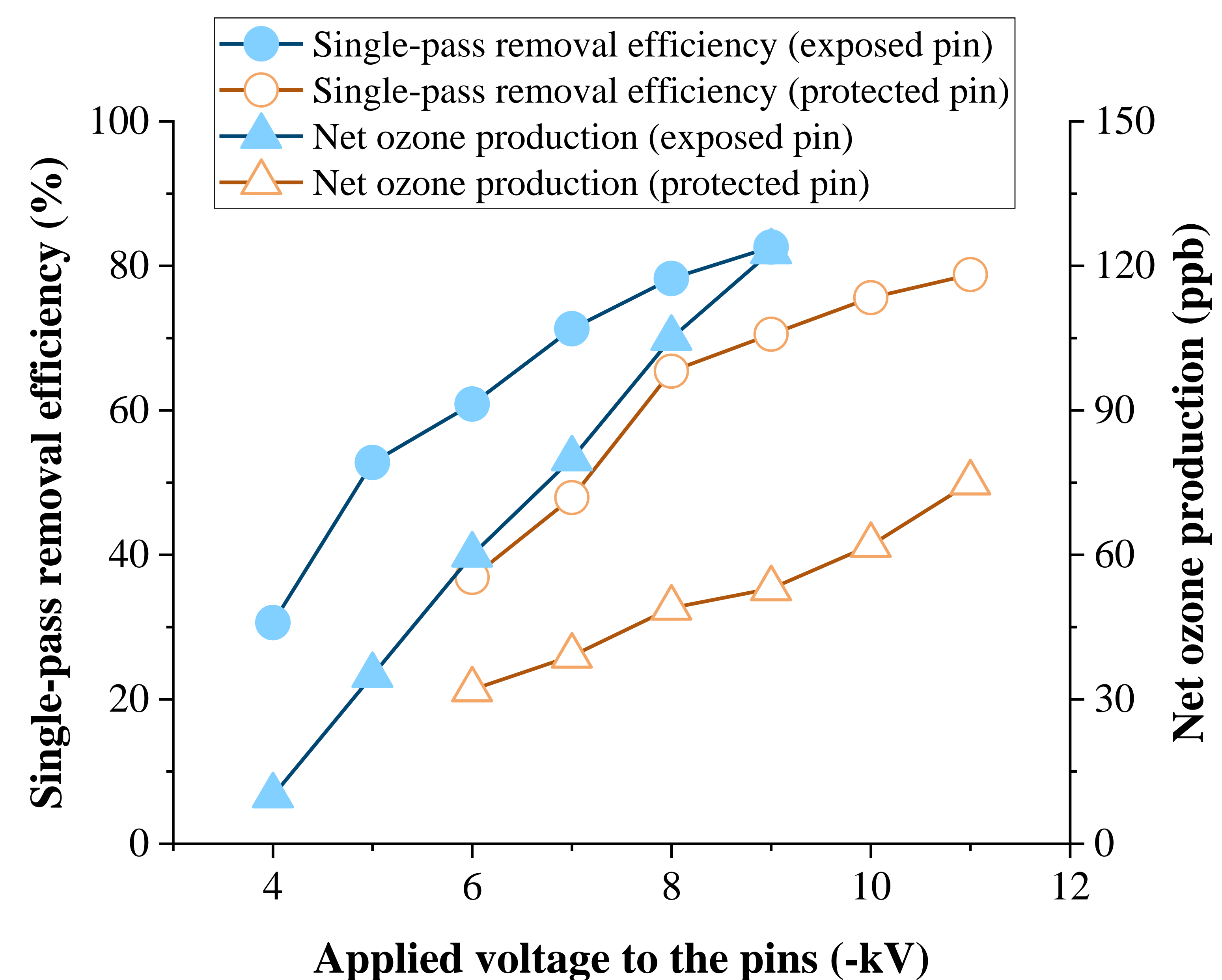
Researches Activities Funs

Developed a new discharger: few particles deposition; lower ozone production and lower breakdown risk by Yuting Gu

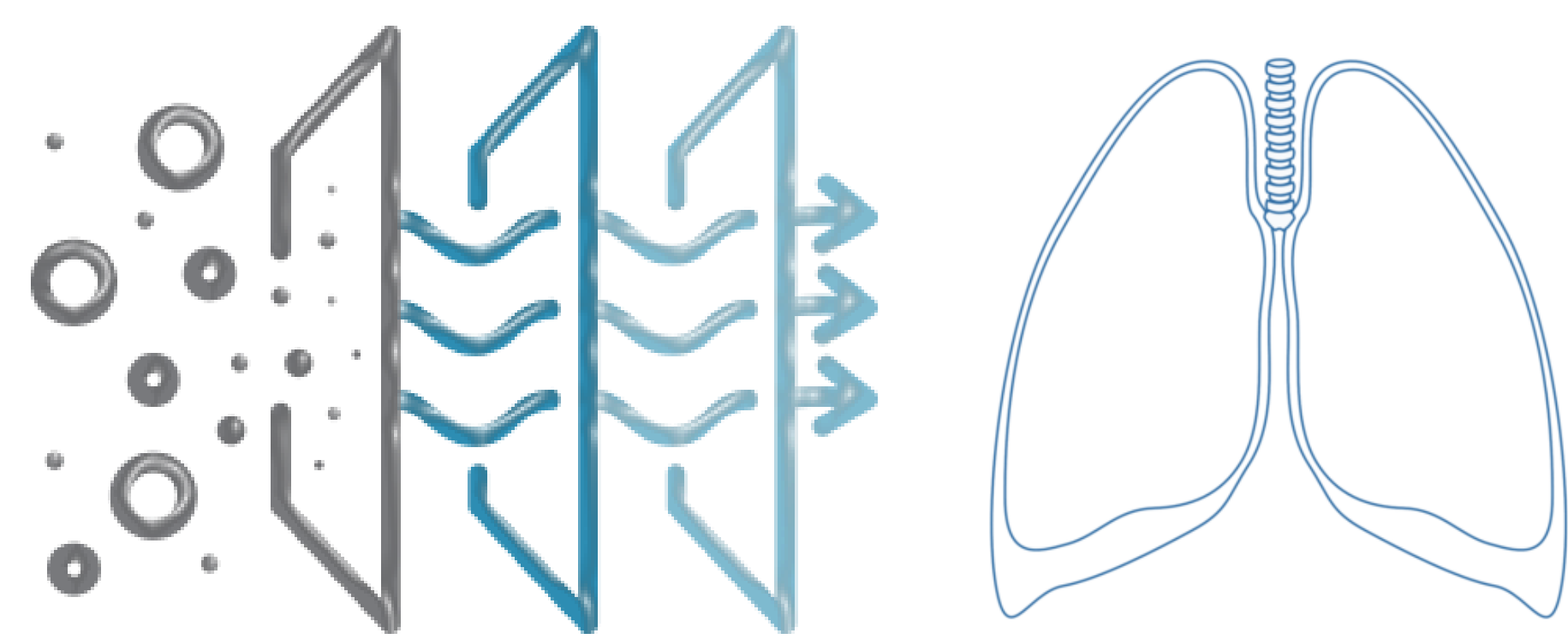
Yuting Gu, Enze Tian, Fanxuan Xia, Tao Yu, Alireza Afshari,, Jinhan Mo*,
Energy and Built Environment, accepted



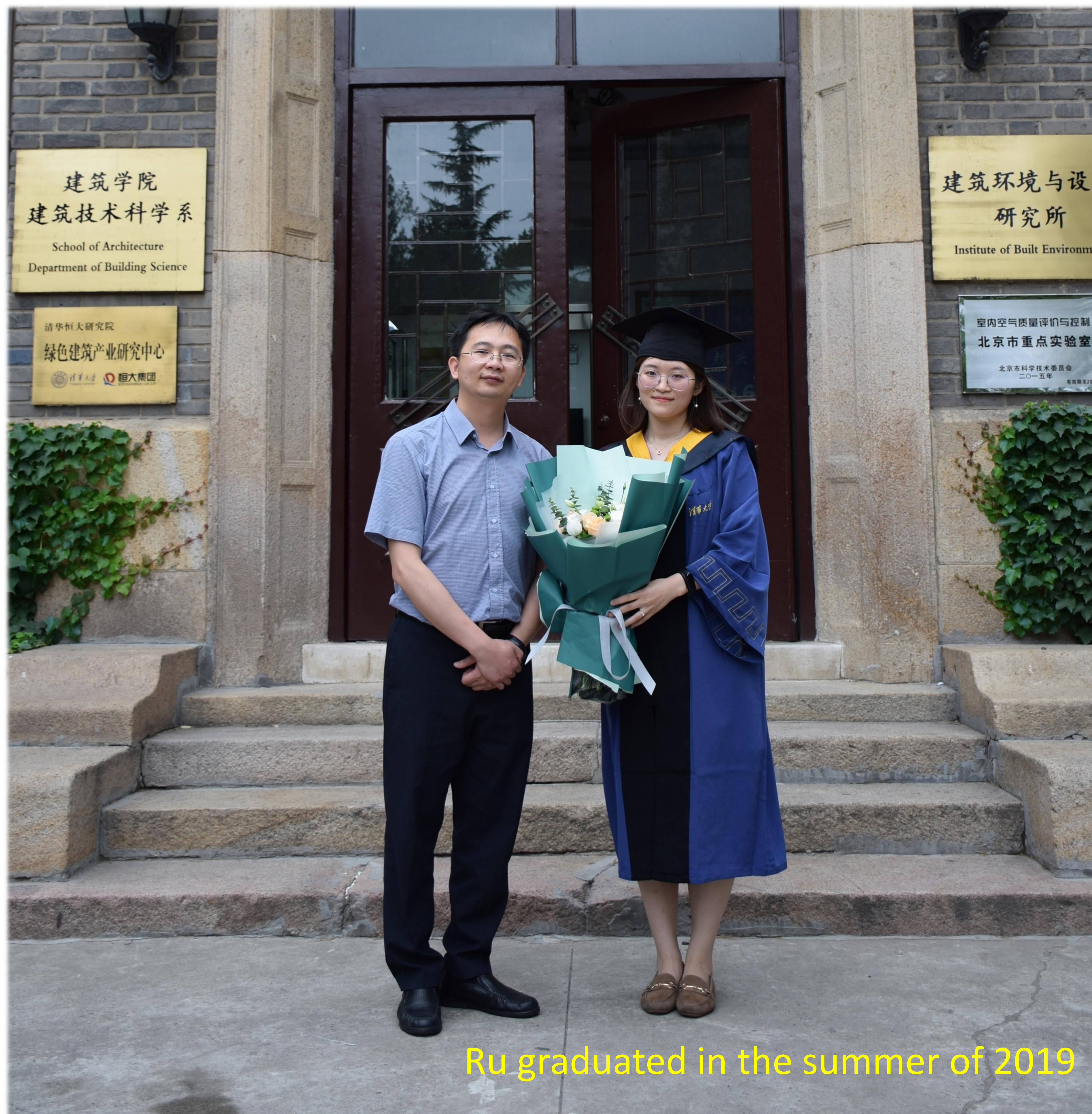
Schematic of new pin-to-plate corona discharge module with clean air protection



Yuting and his toy dog



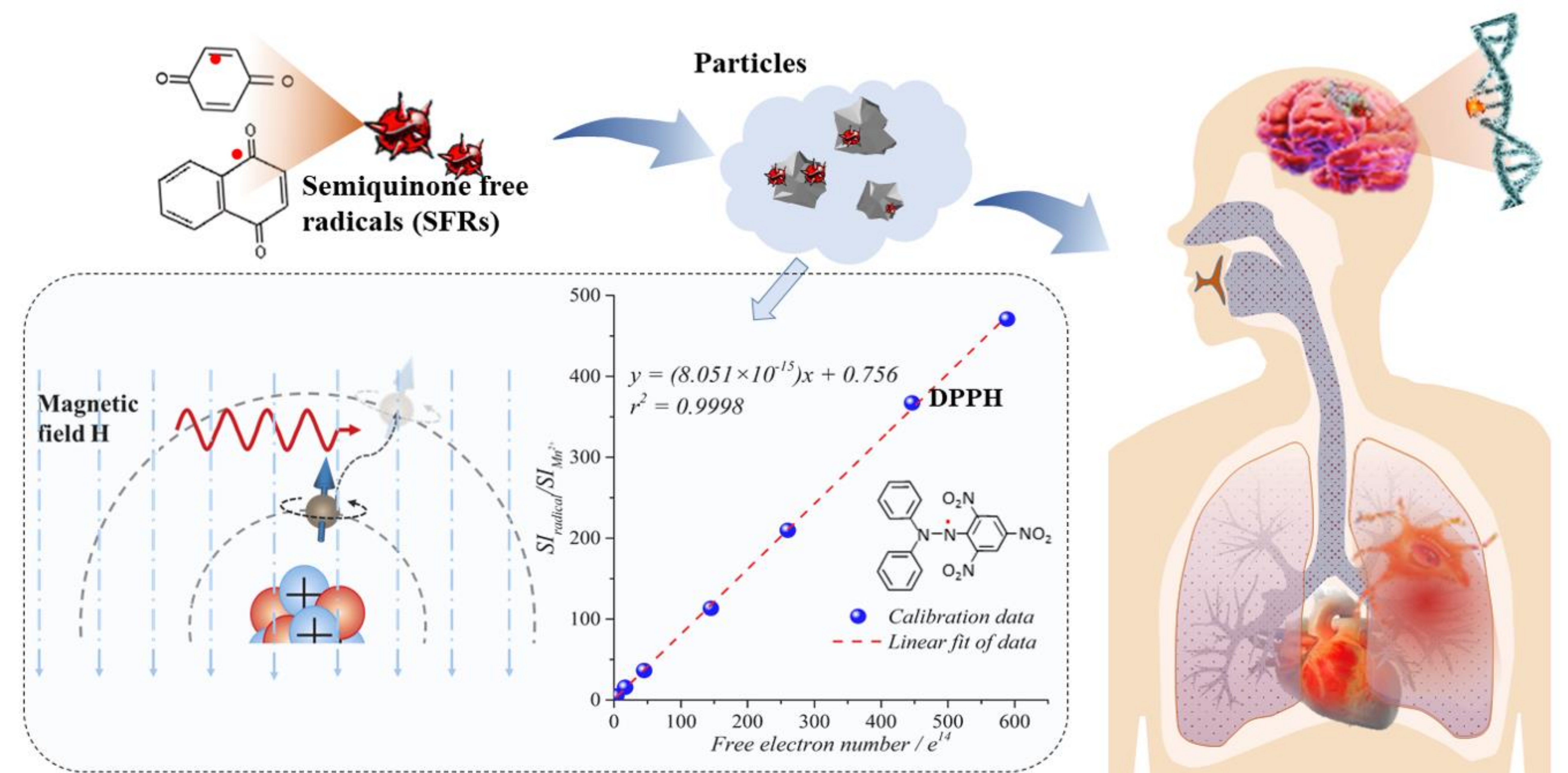
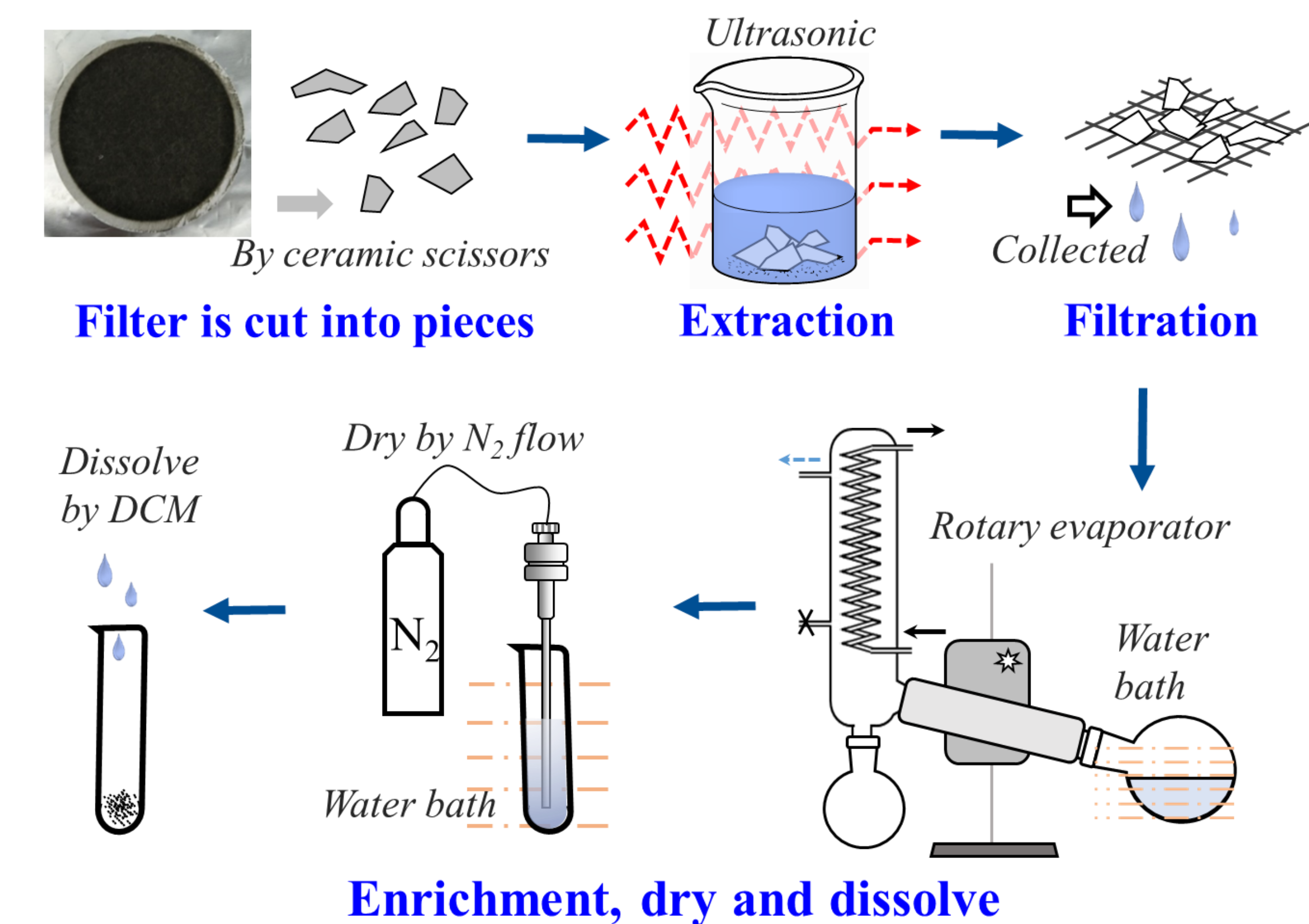
Researches Activities Funs

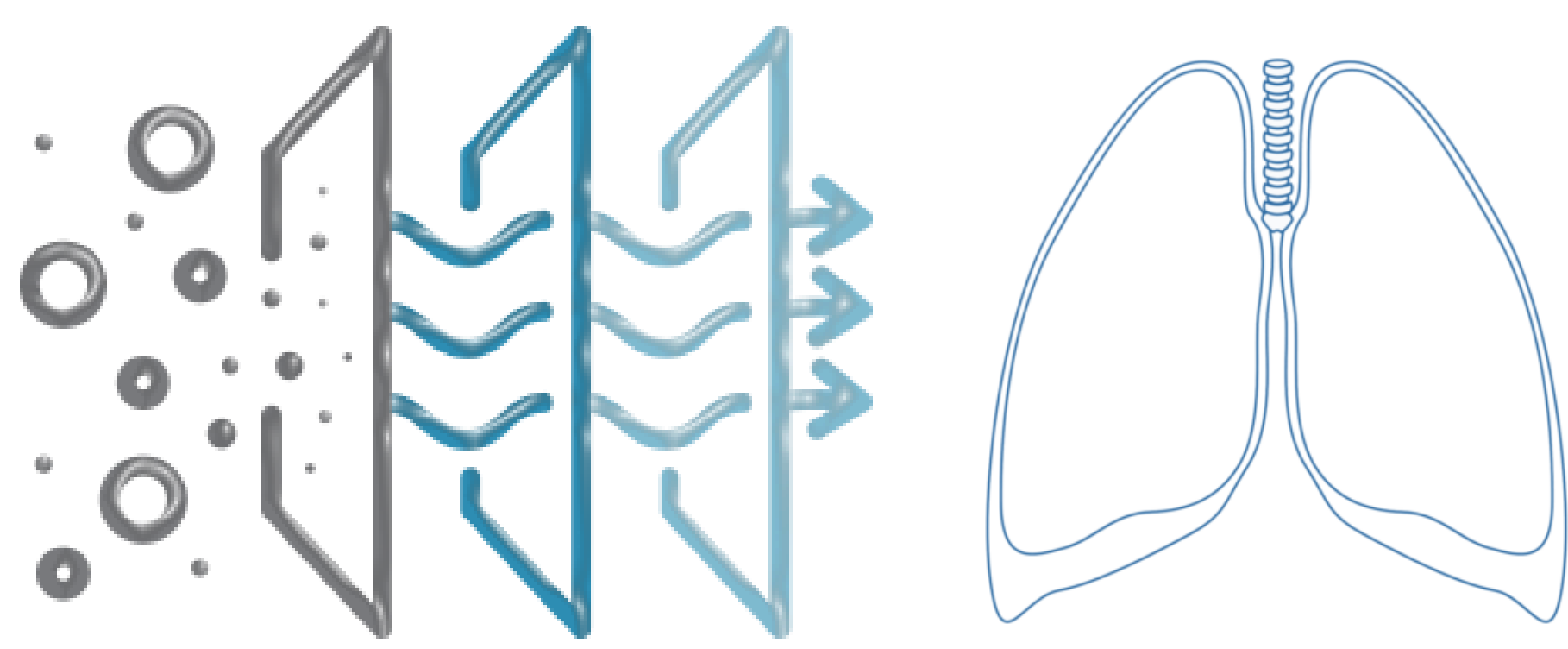


Ru graduated in the summer of 2019

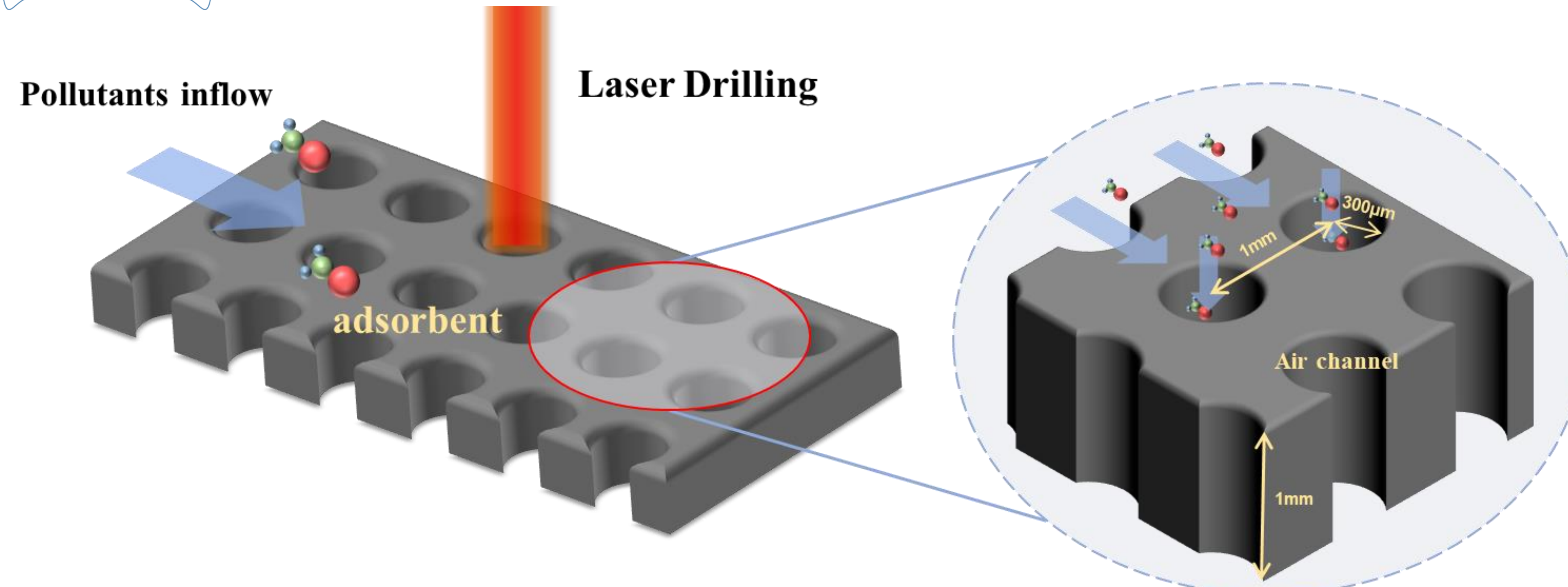
Proposed a quantitative detection method for semiquinone free radicals on particles using electron spin resonance spectroscopy (ESR), by Ru Xiao

Luyang Wang[#], Ru Xiao[#], Jinhan Mo^{*}, Sustainable Cities and Society, 2019, 49, 101614

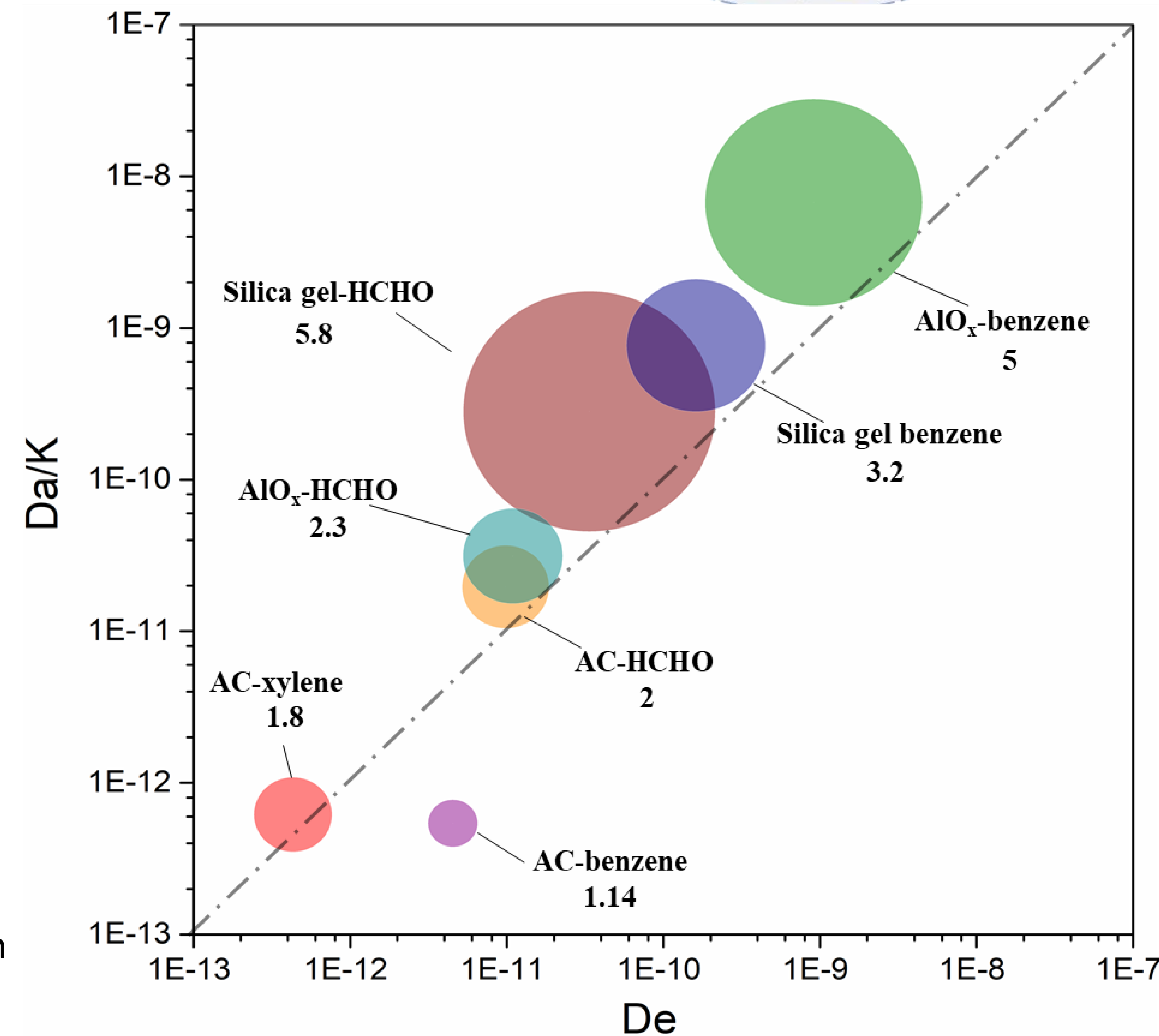




Researches Activities Funs



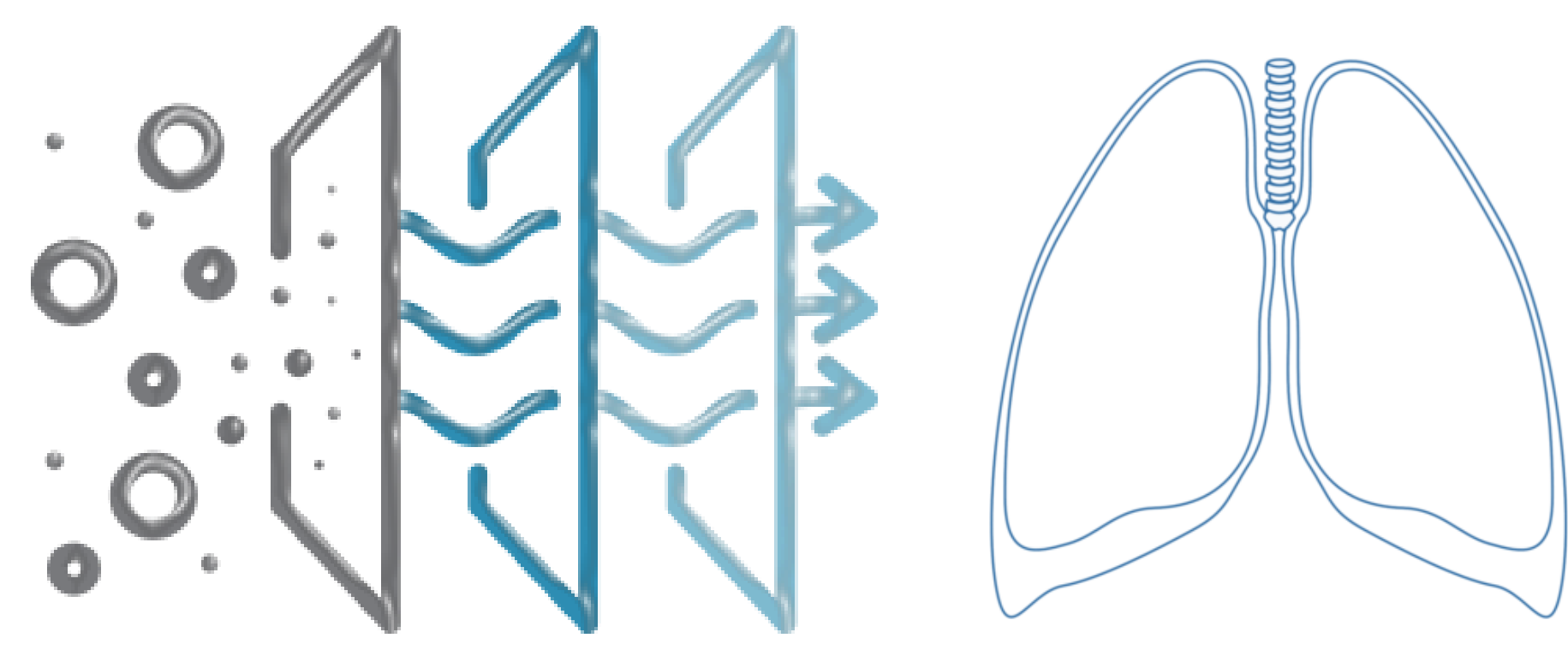
Vertical macro-pore modification by laser drilling to achieve fast diffusion into the adsorbent in a given time period, by Qiwei Chen



The size of the bubble is the enhanced multiple of effective adsorption capacity before and after macro-pore modification



Qiwei is thinking about $E=mc^2$ with a teddy bear.



Researches Activities Funs



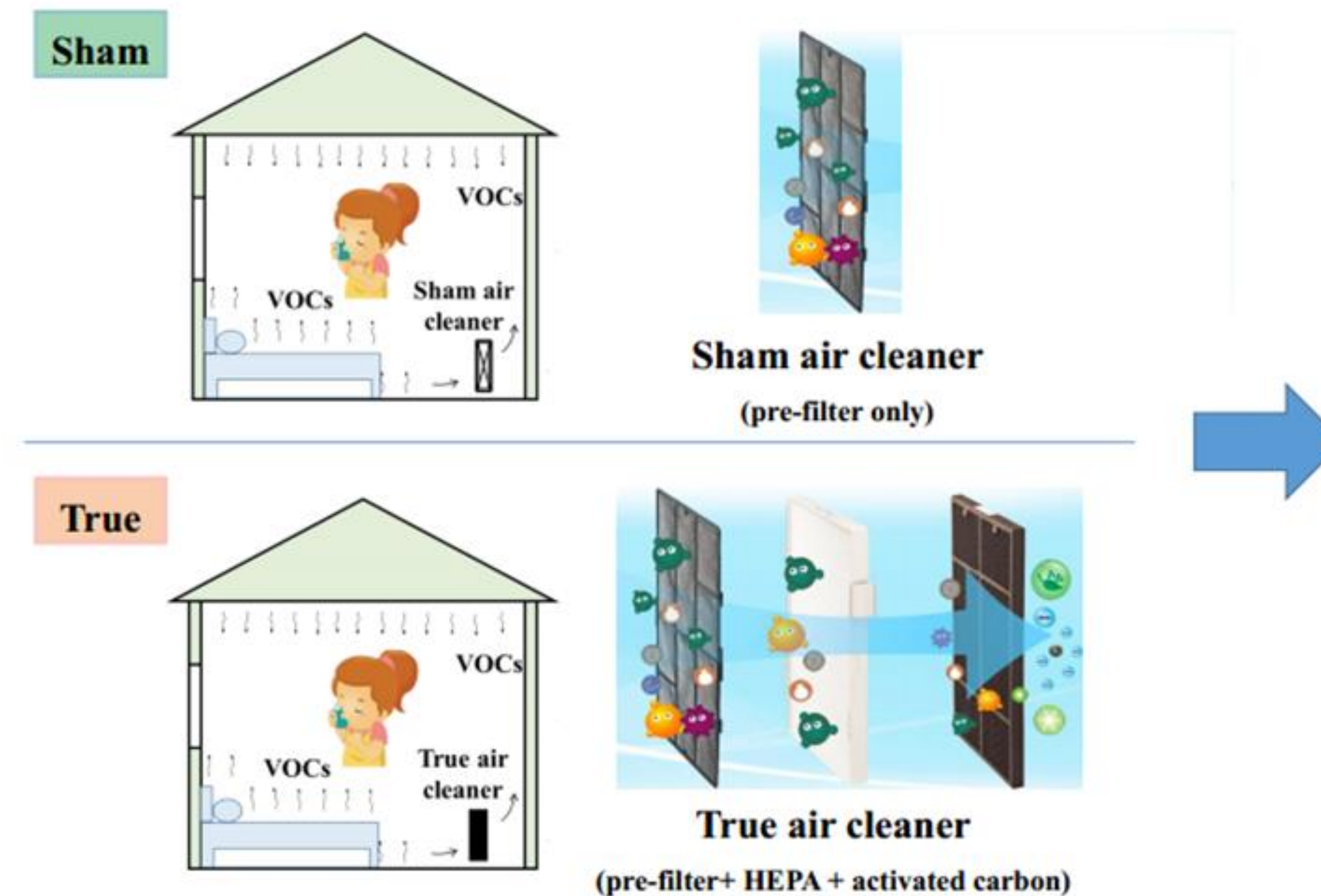
Lin enjoys her last winter at Tsinghua as a Ph.D. student.

Lin is Prof. Yinping Zhang's Ph.D. student.

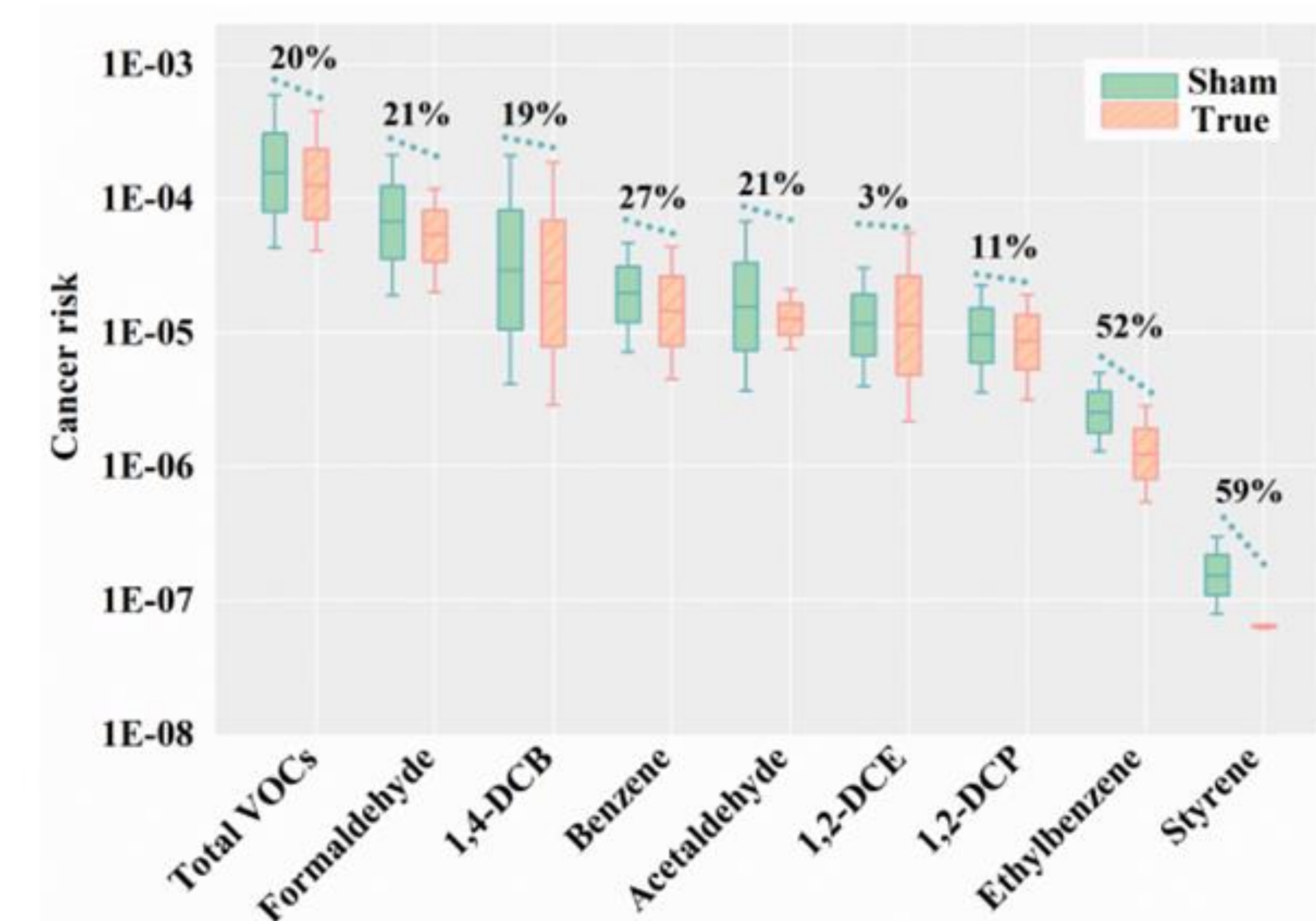
Toxic volatile organic compounds in 20 homes in Shanghai: Concentrations, inhalation health risks, and the impacts of household air cleaning, by Lin Fang

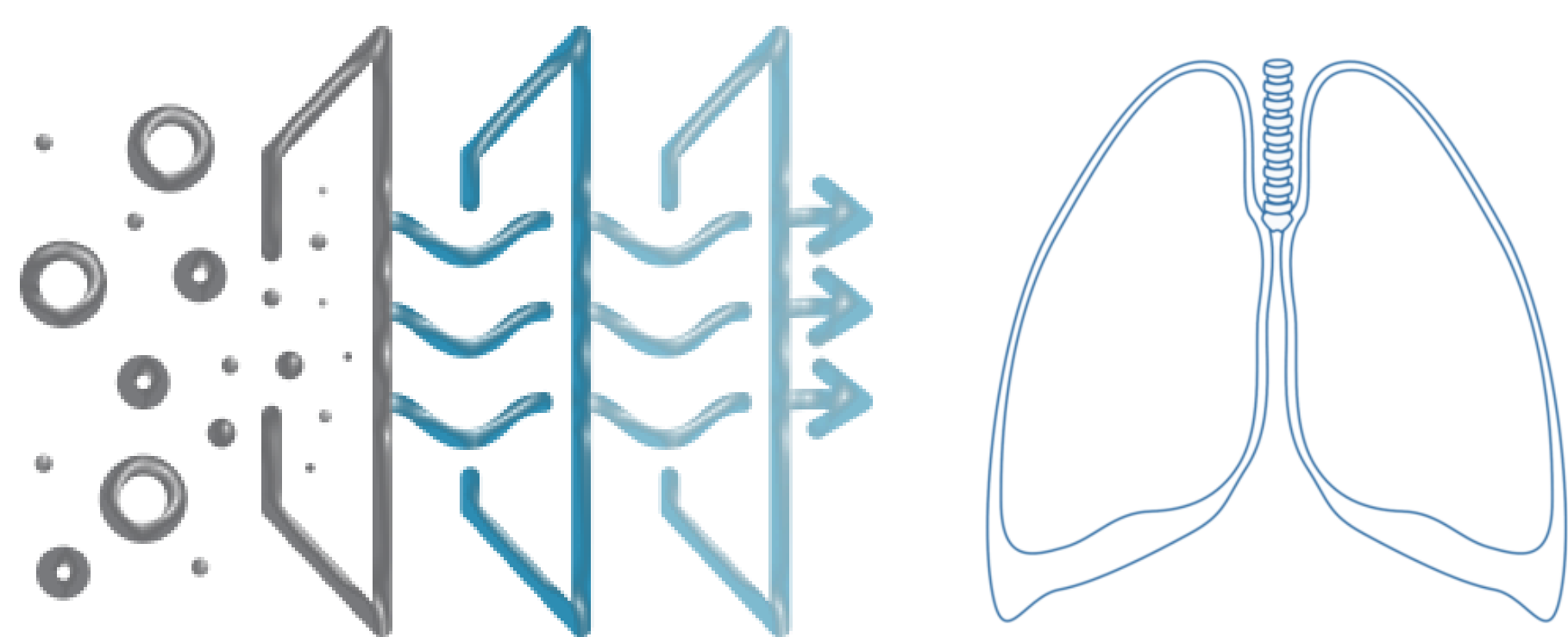
Lin Fang, Christina Norris, Karoline Johnson, Xiaoxing Cui, Jiaqi Sun, Yanbo Teng, Enze Tian, Wei Xu, Zhen Li, Jinhan Mo*, James Jay Schauer, Marilyn Black, Mike Bergin, Jim Zhang, Yinping Zhang, Building and Environment, 157 (2019) 309-318

Study design

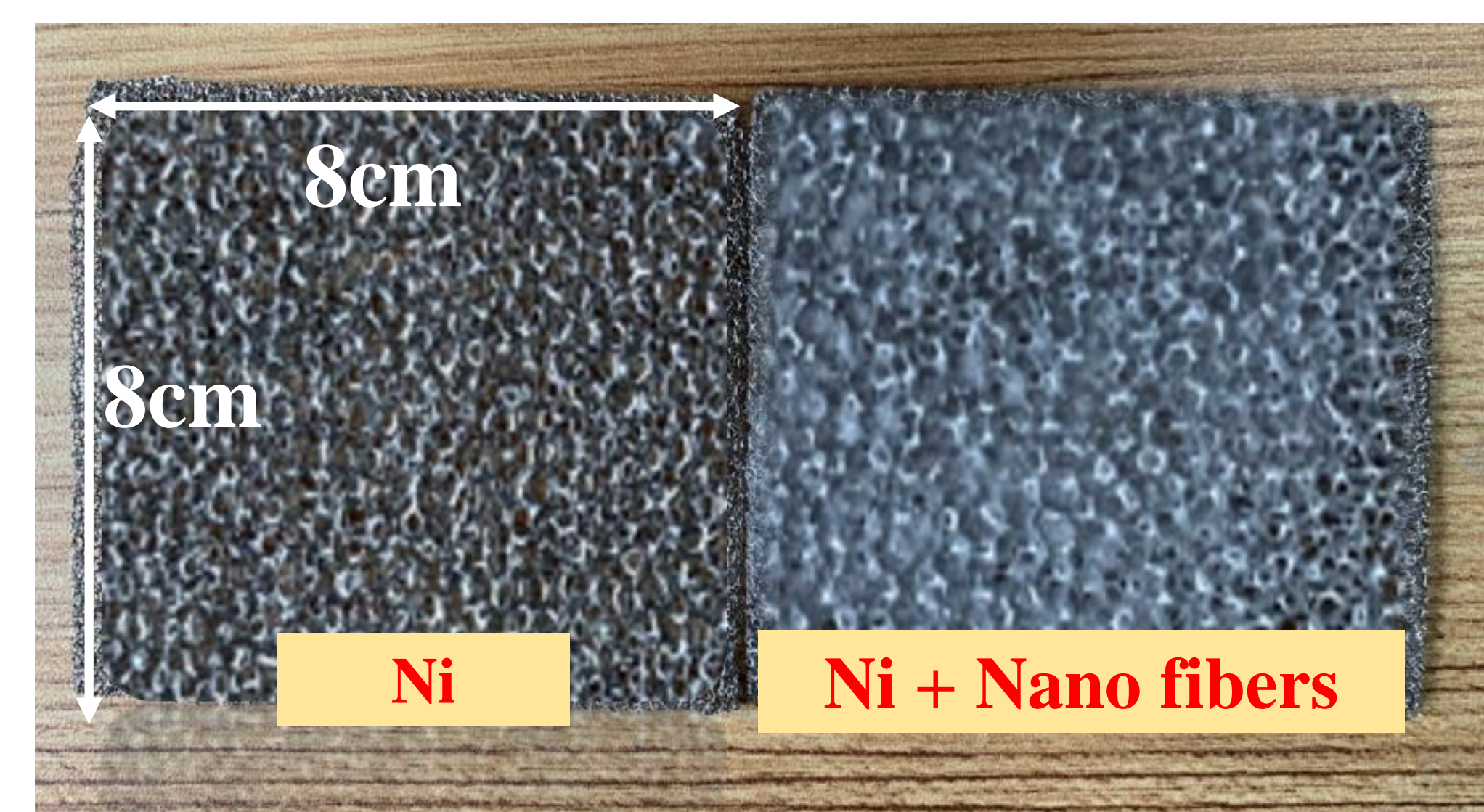
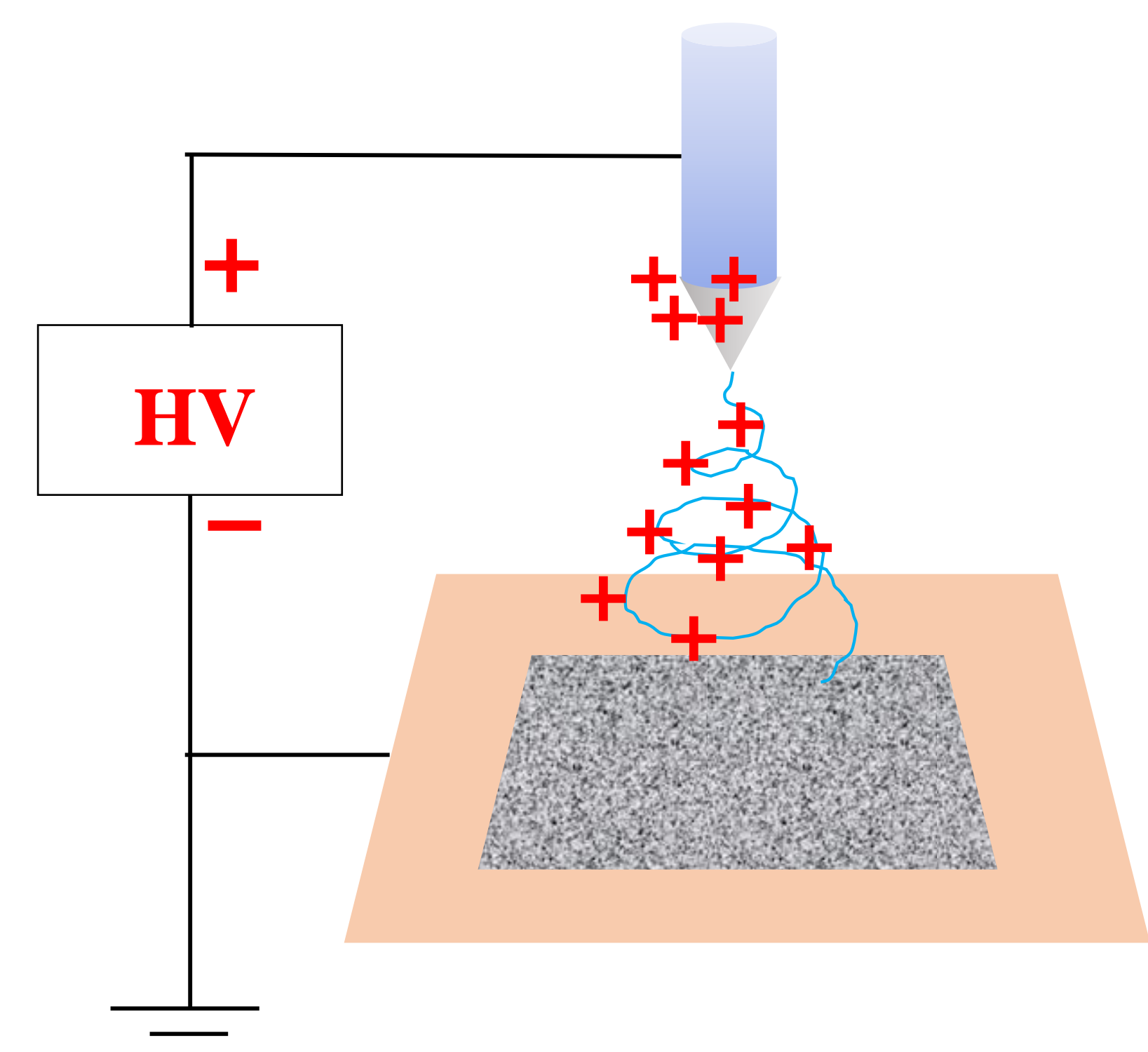


Inhalation cancer risk of toxic VOCs during sham and true filtration



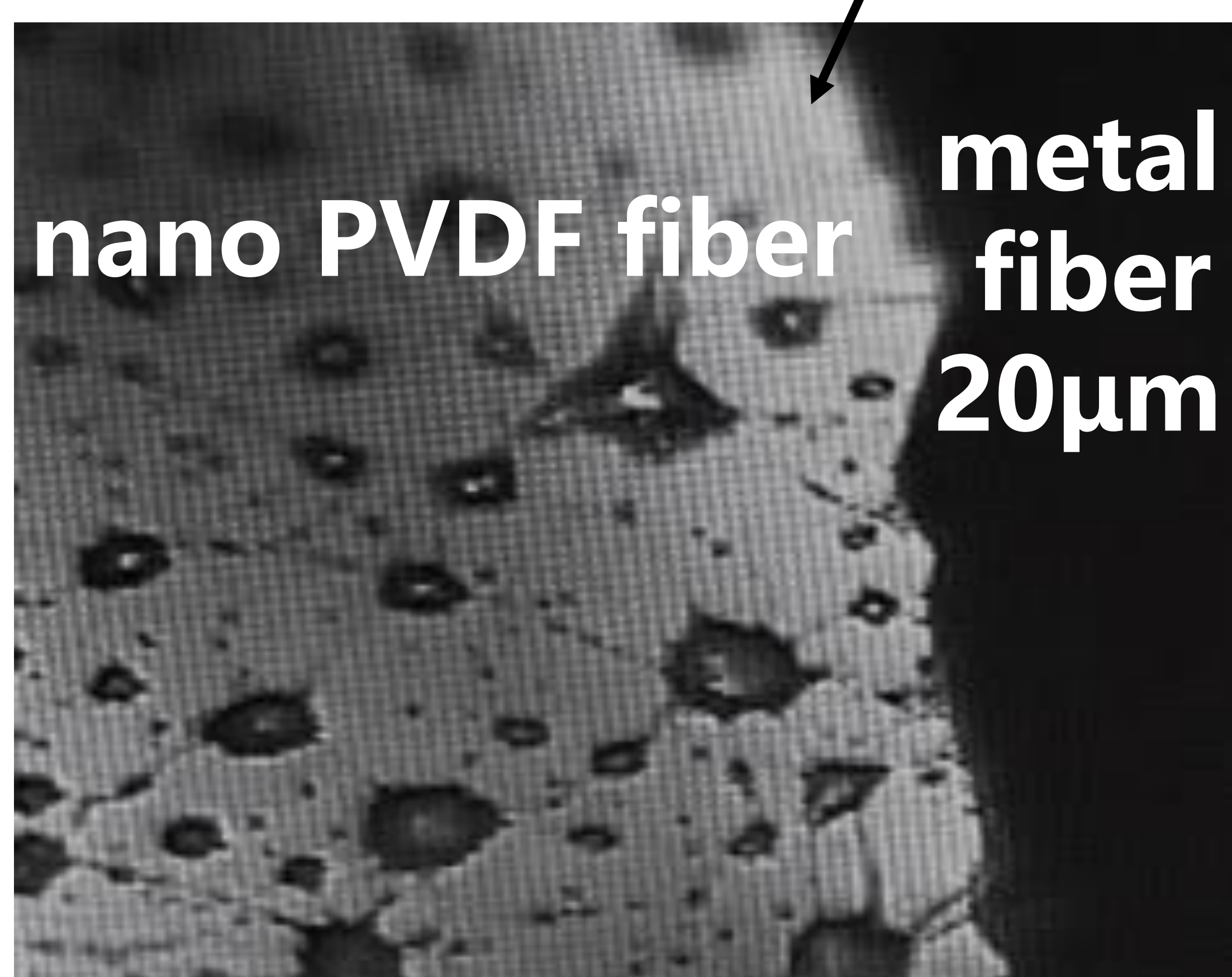
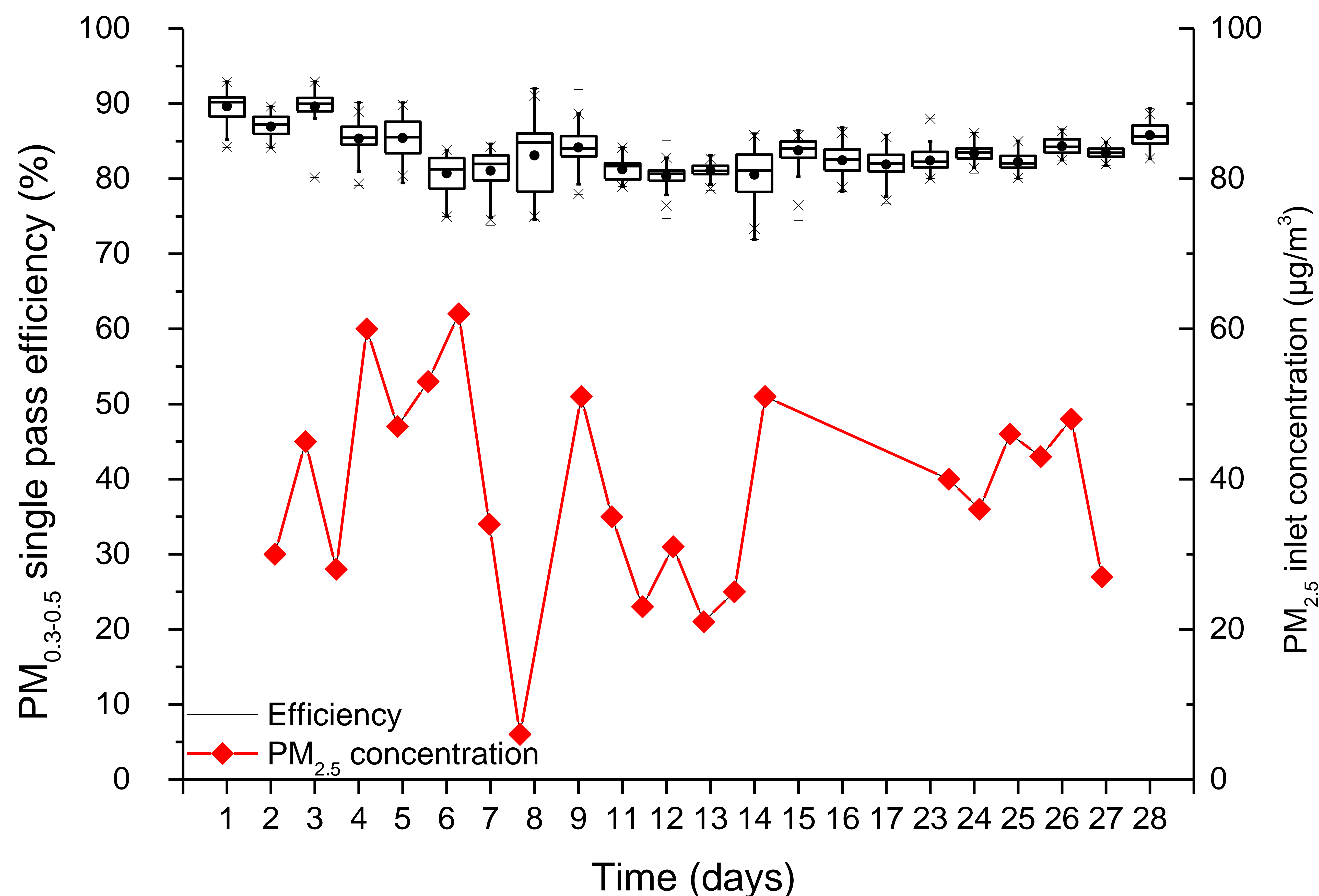


Researches Activities Funs

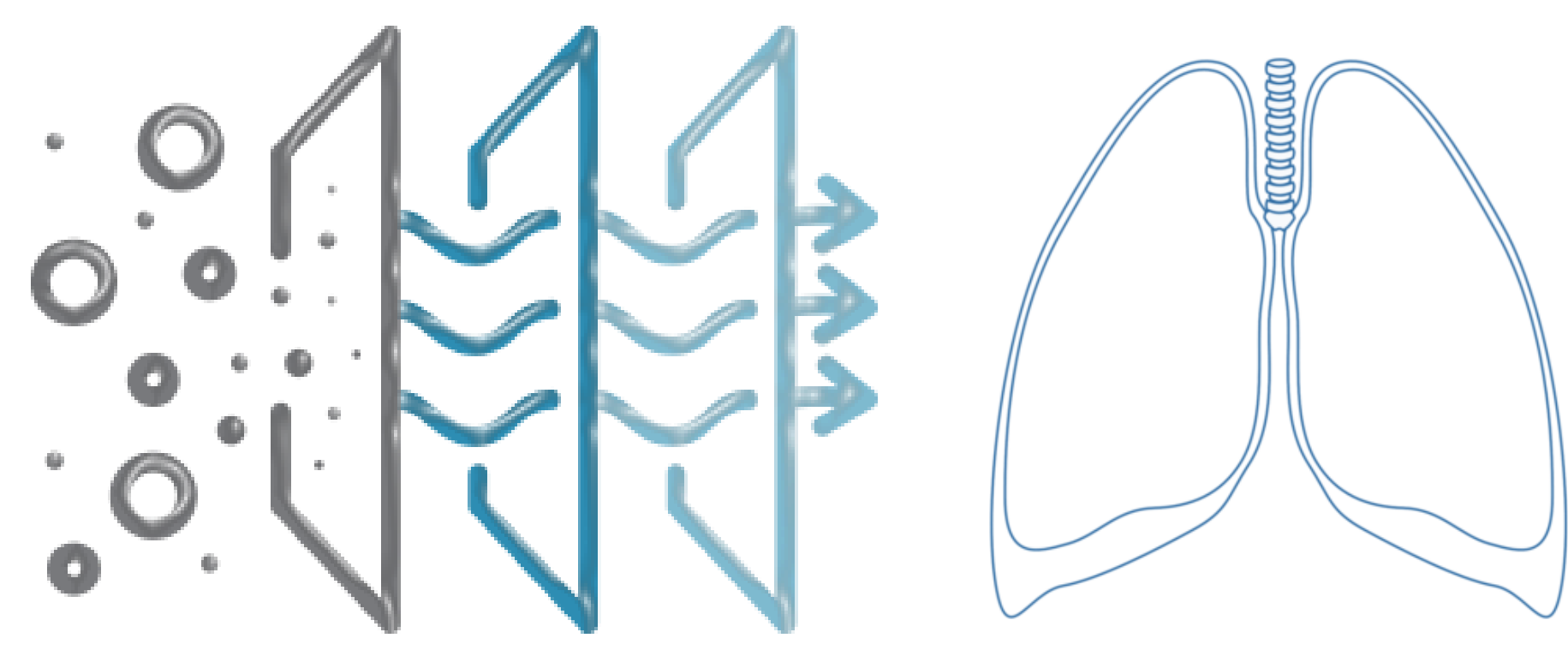


Combination of nanofibers and electrostatically assisted metal foam (EAMF) filter by electrospinning for particle removal, by Fanxuan Xia, Yilun Gao and Xiao Lei

Increase the efficiency of EAMF filter by **15%** and **prevent rapid efficiency decrease** in long-term test



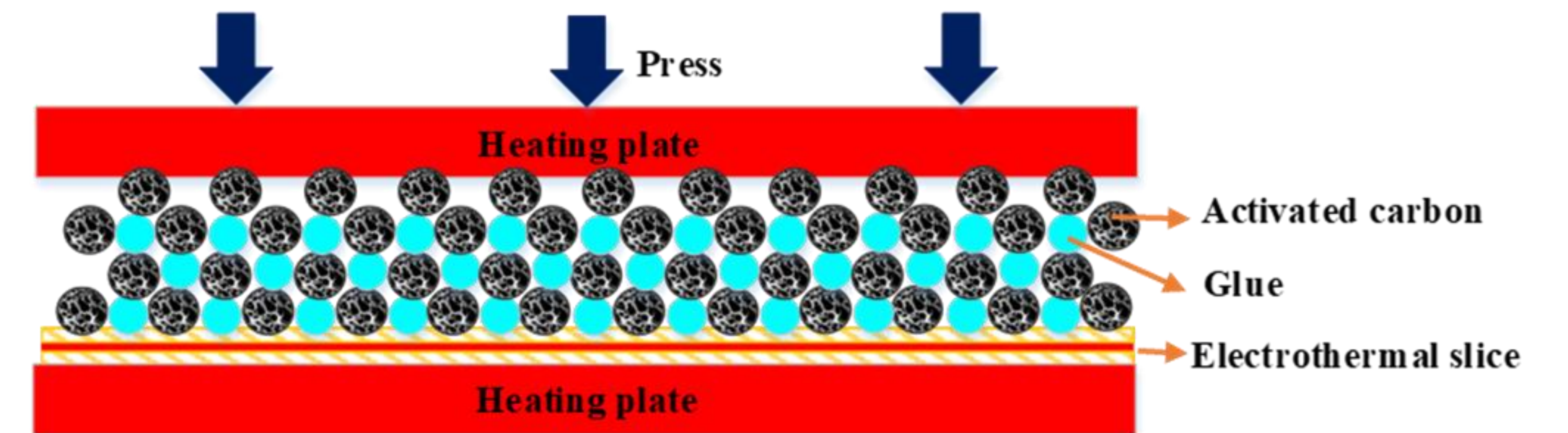
Fanxuan visited Daikin at Osaka



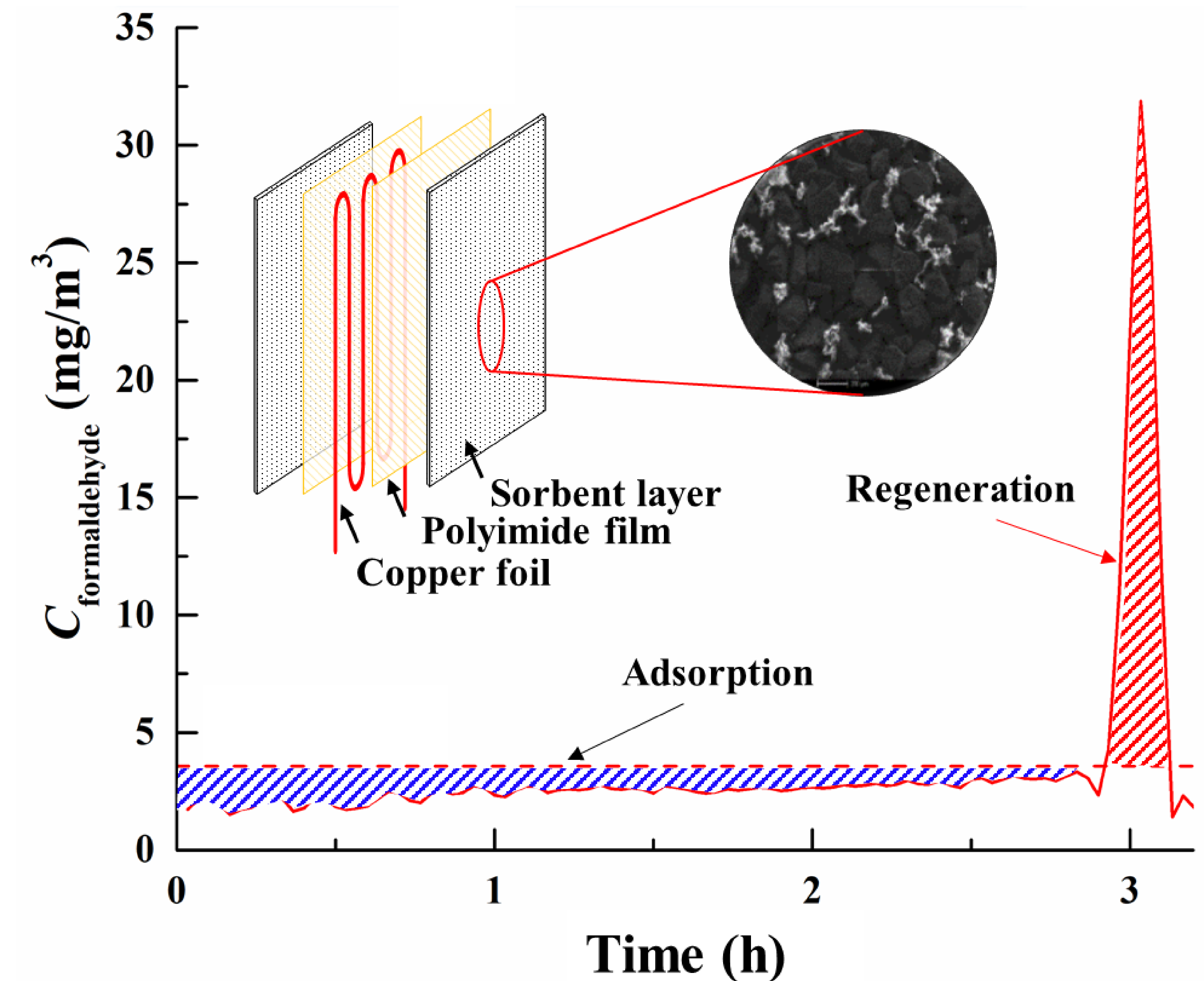
Researches Activities Funs

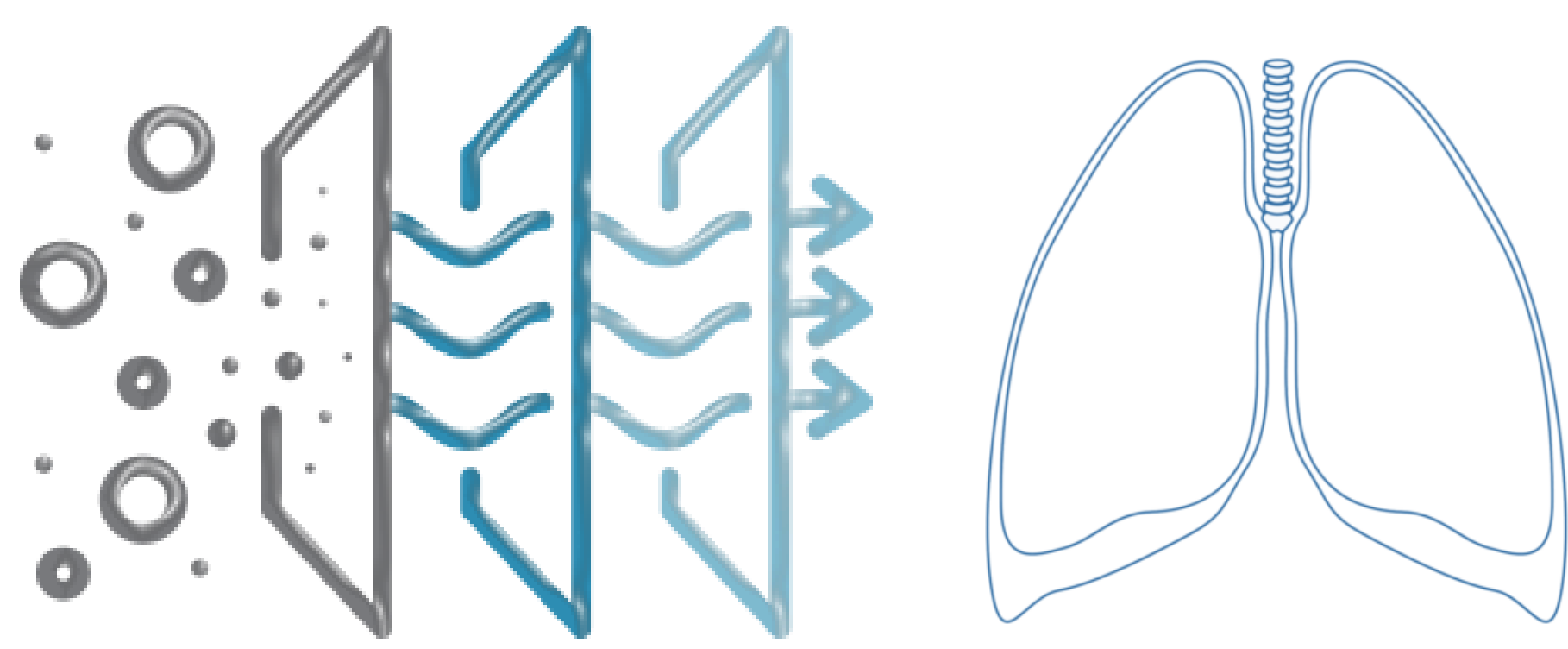
Developed a novel laminated plate fabricated with activated carbon, polyimide and copper foil with adjustable surface temperature and capable of in-situ thermal regeneration, by Hongyin Chen

Hongyin Chen, Jinhan Mo*, Ru Xiao, Enze Tian, Indoor Air, 2019, 29: 469-476.



Celebrating Hongyin's birthday.

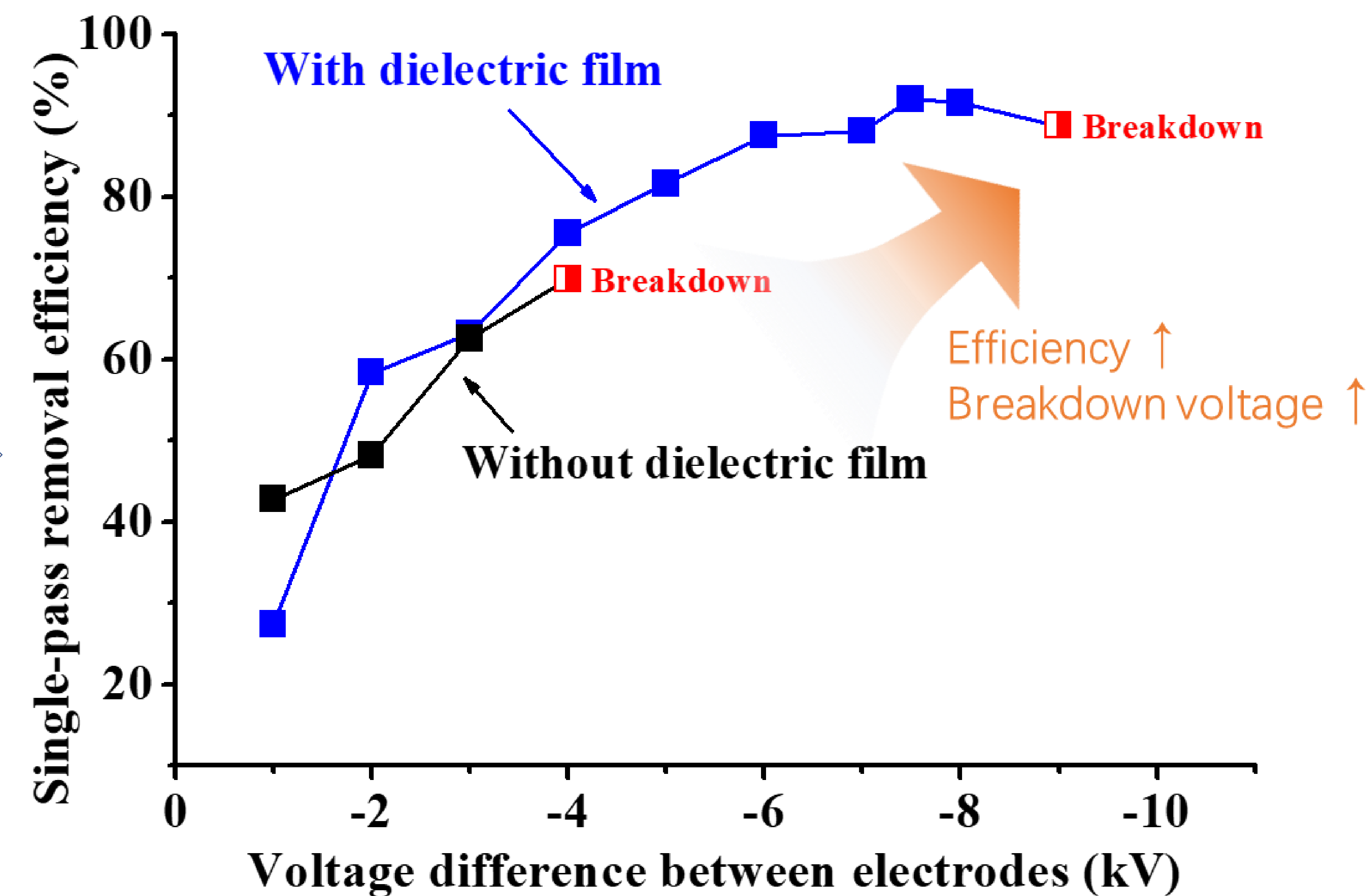
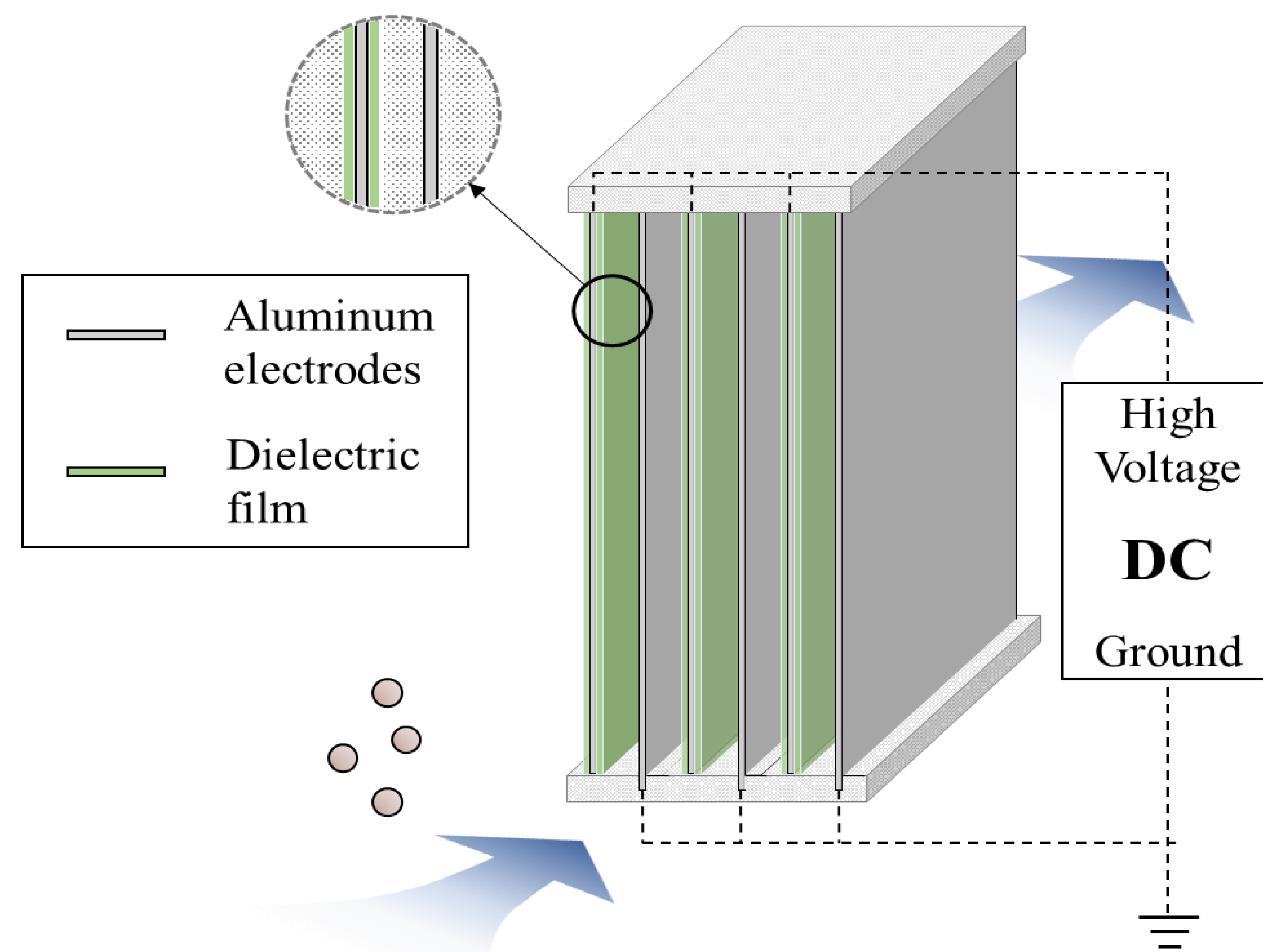
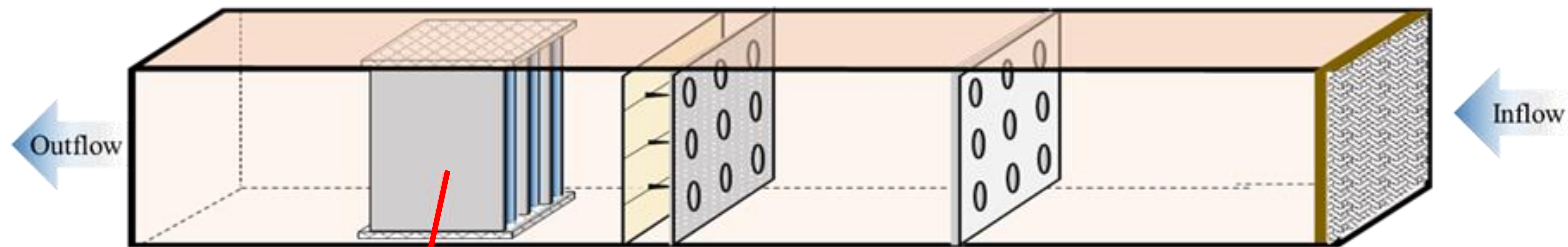


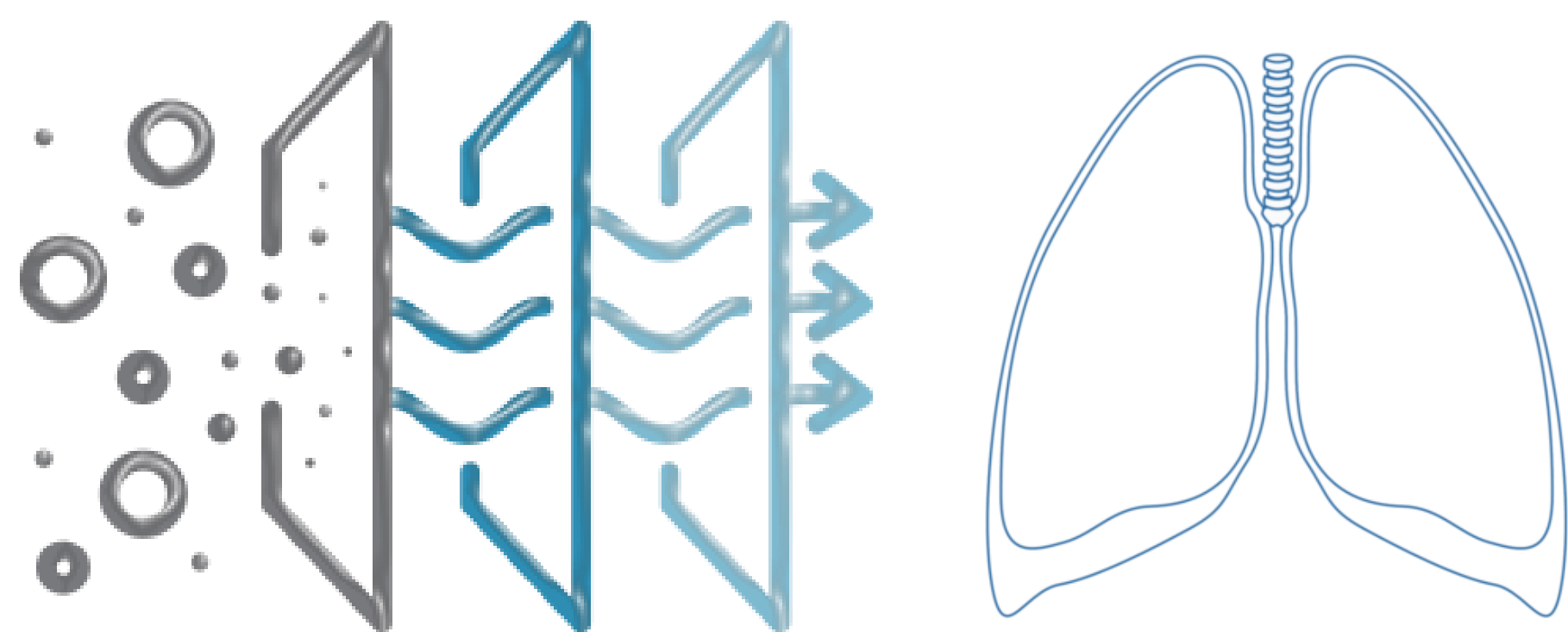


Researches Activities Funs

A new ESP with dielectric coatings on repelling electrode plates with the removal efficiency for PM_{0.3 - 0.5} reaching 92%, by Jin Pan

Jinhan Mo, Enze Tian, Jin Pan*, Sustainable Cities and Society, Submitted

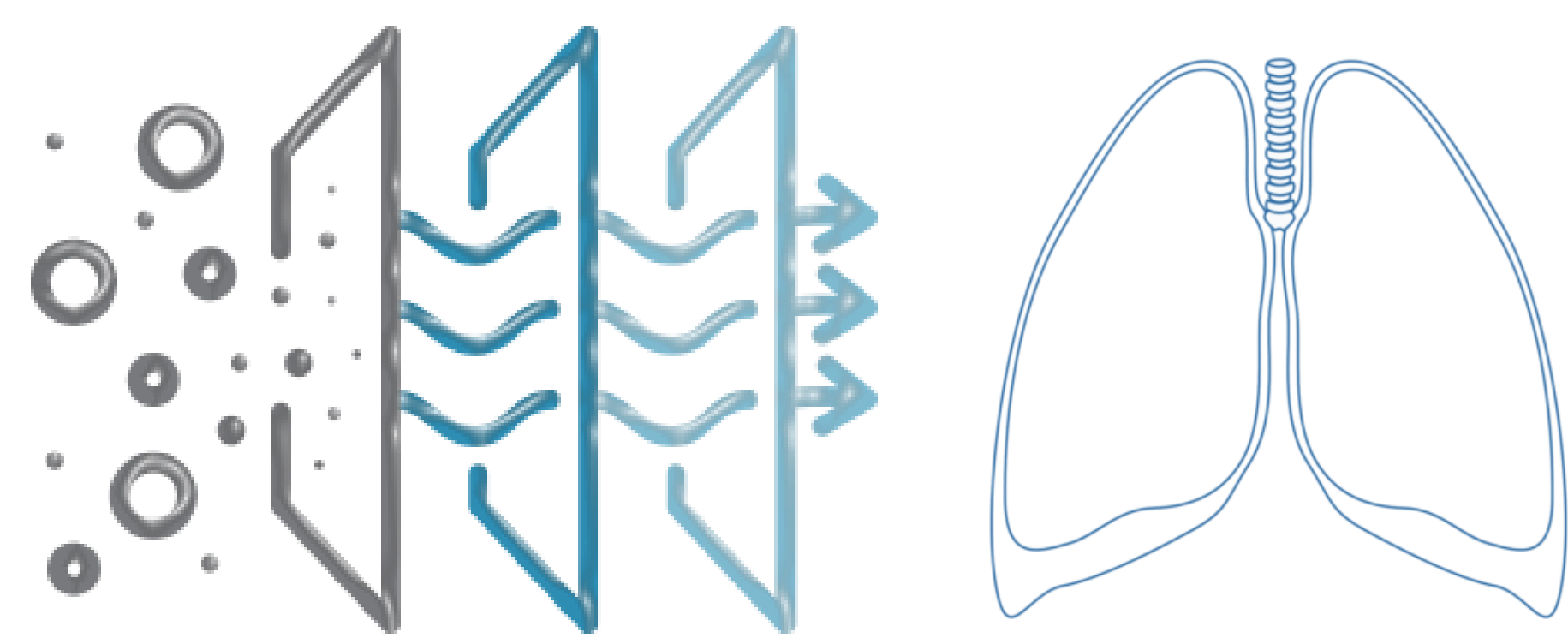




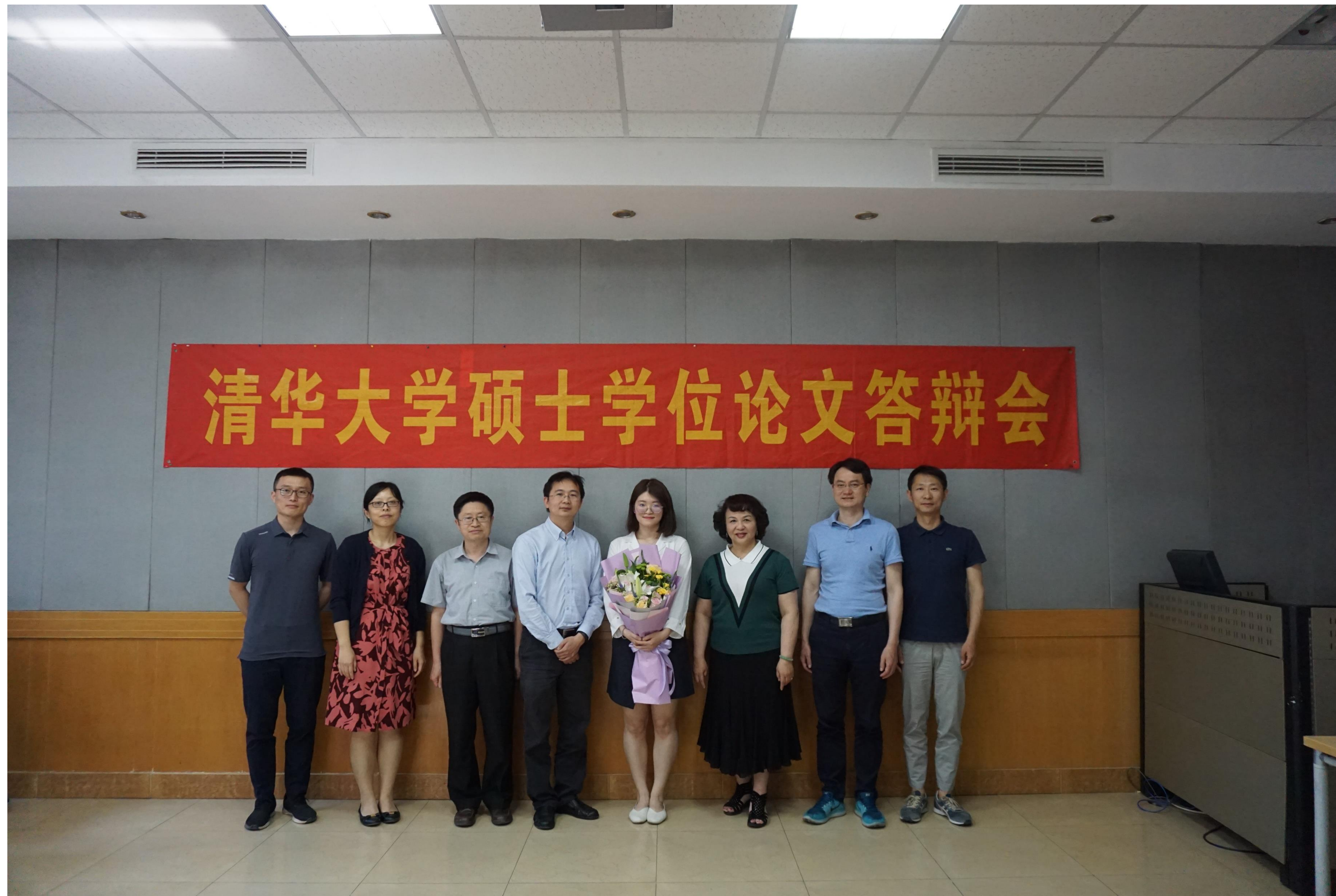
Researches Activities Funs

Publications we achieved in 2019

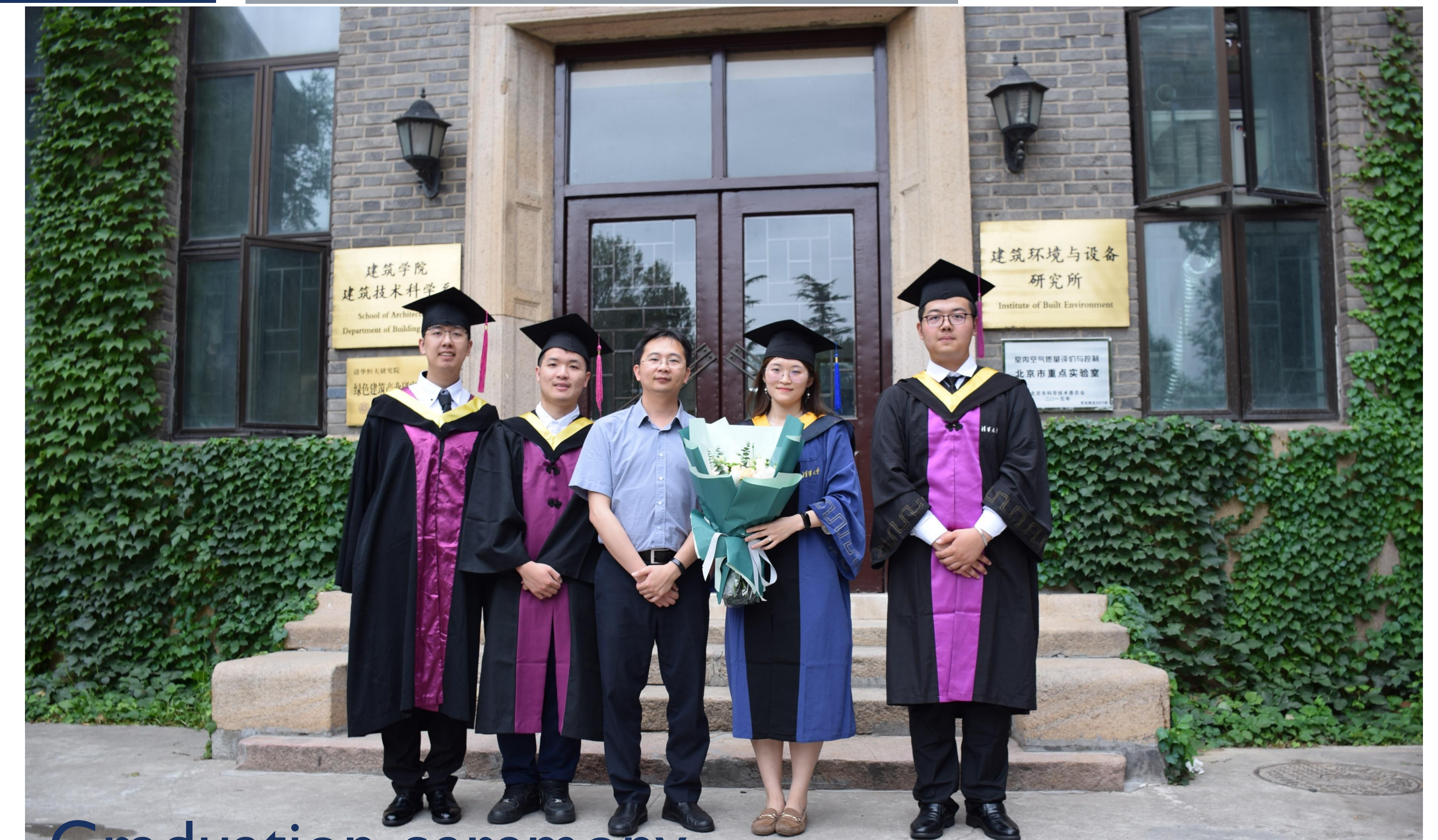
- Tian EZ, Gao YL, Mo JH*, Electrostatically assisted air coarse filtration for energy efficient ambient particles removal: Long-term performance in real environment and influencing factors, *Building and Environment*, 2019, 164: 106348.
- Tian EZ, Mo JH*, Toward energy saving and high efficiency through an optimized use of a PET coarse filter: The development of a new electrostatically assisted air filter, *Energy and Buildings*, 2019, 186: 276-283.
- Chen Z, Afshari A, Mo JH*, A method using porous media to deliver gas-phase phthalates rapidly and at a constant concentration: effects of temperature and media, *Environmental Pollution*, accepted
- Chen HY, Mo JH*, Xiao R, Tian EZ, Gaseous formaldehyde removal: A laminated plate fabricated with activated carbon, polyimide, and copper foil with adjustable surface temperature and capable of in-situ thermal regeneration, *Indoor Air*, 2019, 29(3): 469-476
- Wang LY, Xiao R, Mo JH*, Quantitative detection method of semiquinone free radicals on particulate matters using electron spin-resonance spectroscopy, *Sustainable Cities and Society*, 2019, 49, 101614.
- Fang L, Norris C, Johnson K, Cui XX, Sun JQ, Teng YB, Tian EZ, Xu W, Lig Z, Mo JH*, Schauer JJ, Black M, Bergin M, Zhang JF, Zhang YP, Toxic volatile organic compounds in 20 homes in Shanghai: Concentrations, inhalation health risks, and the impacts of household air cleaning, *Building and Environment*, 2019, 157:309-318.
- Gu YT, Tian EZ, Fan XX, Tao Y, Afshari A, Mo JH*, A new pin-to-plate corona discharger with clean air protection for particulate matter removal, *Energy and Built Environment*, accepted
- He LZ, Cui XX, Xia QY, Li F, Mo JH, Gong JC, Zhang YP, Zhang JF*, Effects of personal air pollutant exposure on oxidative stress: potential confounding by natural variation in melatonin levels, *International Journal of Hygiene and Environmental Health*, 2020, 223: 116-123
- Xu MM, Zhang YB, Wang MY, Zhang H, Chen YQ, Adcock IM, Chung KF, Mo JH, Zhang YP, Li F*, TRPV1 and TRPA1 in lung inflammation and airway hyperresponsiveness induced by fine particulate matter (PM2.5), *Oxidative Medicine and Cellular Longevity*, 2019, 7450151.
- Norris C*, Fang L, Barkjohn KK, Carlson D, Zhang YP, Mo JH, Li Z, Zhang J, Cui X, Schauer JJ, Davis A, Sources of volatile organic compounds in suburban homes in Shanghai, China, and the impact of air filtration on compound concentrations, *Chemosphere*, 2019, 231: 256-268.
- Xiang JB, Weschler CJ*, Wang QQ, Zhang L, Mo JH, Ma R, Zhang JF*, Zhang YP*, Reducing indoor levels of 'outdoor PM2.5' in urban China: impact on mortalities, *Environmental Science & Technology*, 2019, 53 (6): 3119-3127.
- Liu W, Huang C, Li BZ, Zhao ZH, Yang X, Deng QH, Zhang X, Qian H, Sun YX, Qu F, Wang LF, Lin ZJ, Lu C, Wang H, Wang J, Zhang JL, Sun CJ, Mo JH, Weschler LB, Norbäck D, Sundell J, Zhang YP*, Household renovation before and during pregnancy in relation to preterm birth and low birthweight in China, *Indoor Air*, 2019, 29(2):202-214.
- Cui XX, Li Z, Teng YB, Barkjohn KK, Norris C, Fang L, Daniel G, He LC, Lin LL, Wang Q, Day DB, Zhou XJ, Hong JG, Gong JC, Li F, Mo JH, Zhang YP, Schauer JJ, Black M, Bergin MH, Zhang JF*, Impacts of Bedroom Particulate Matter Filtration on Airway Pathophysiology in Children with Asthma, *JAMA Pediatrics*, accepted



Researches Activities Funs



Ru XIAO finished her master dissertation defense

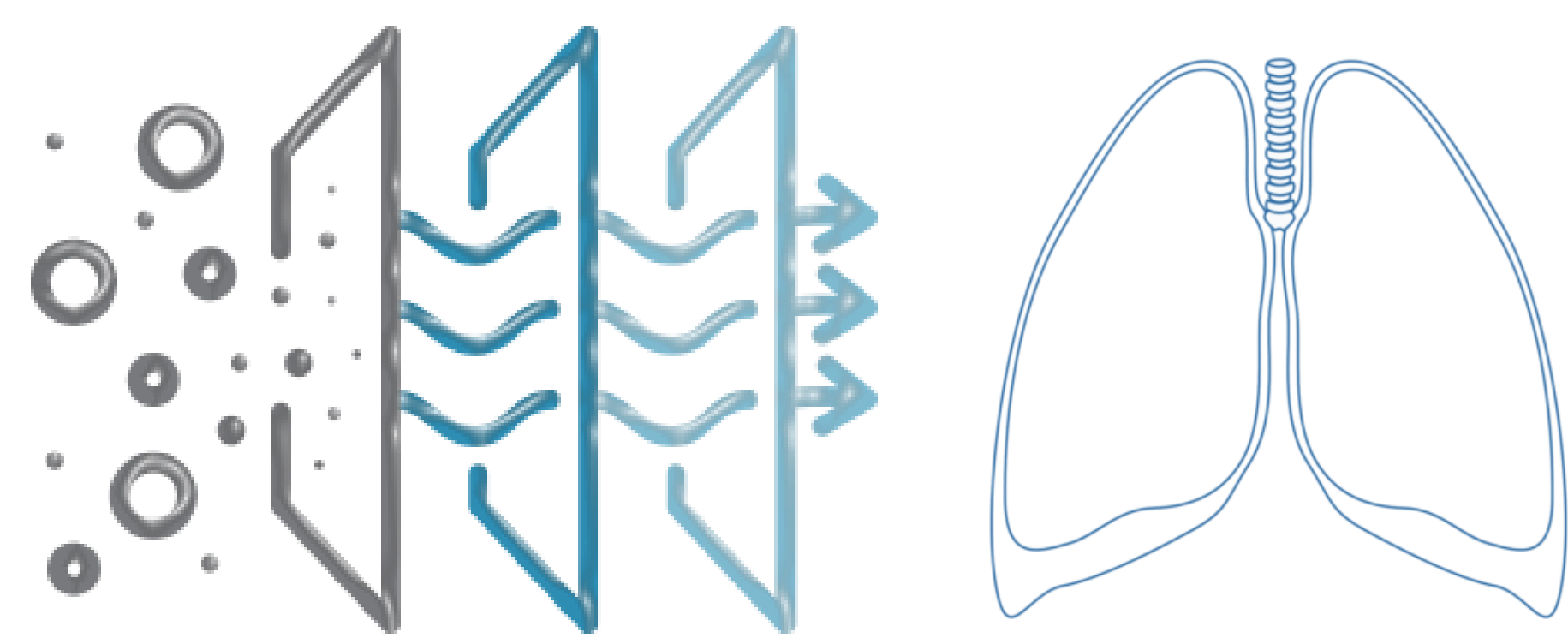


Graduation ceremony

from left to right: Fanxuan XIA, Yuting GU, Jinhan MO, Ru XIAO, Qiwei CHEN

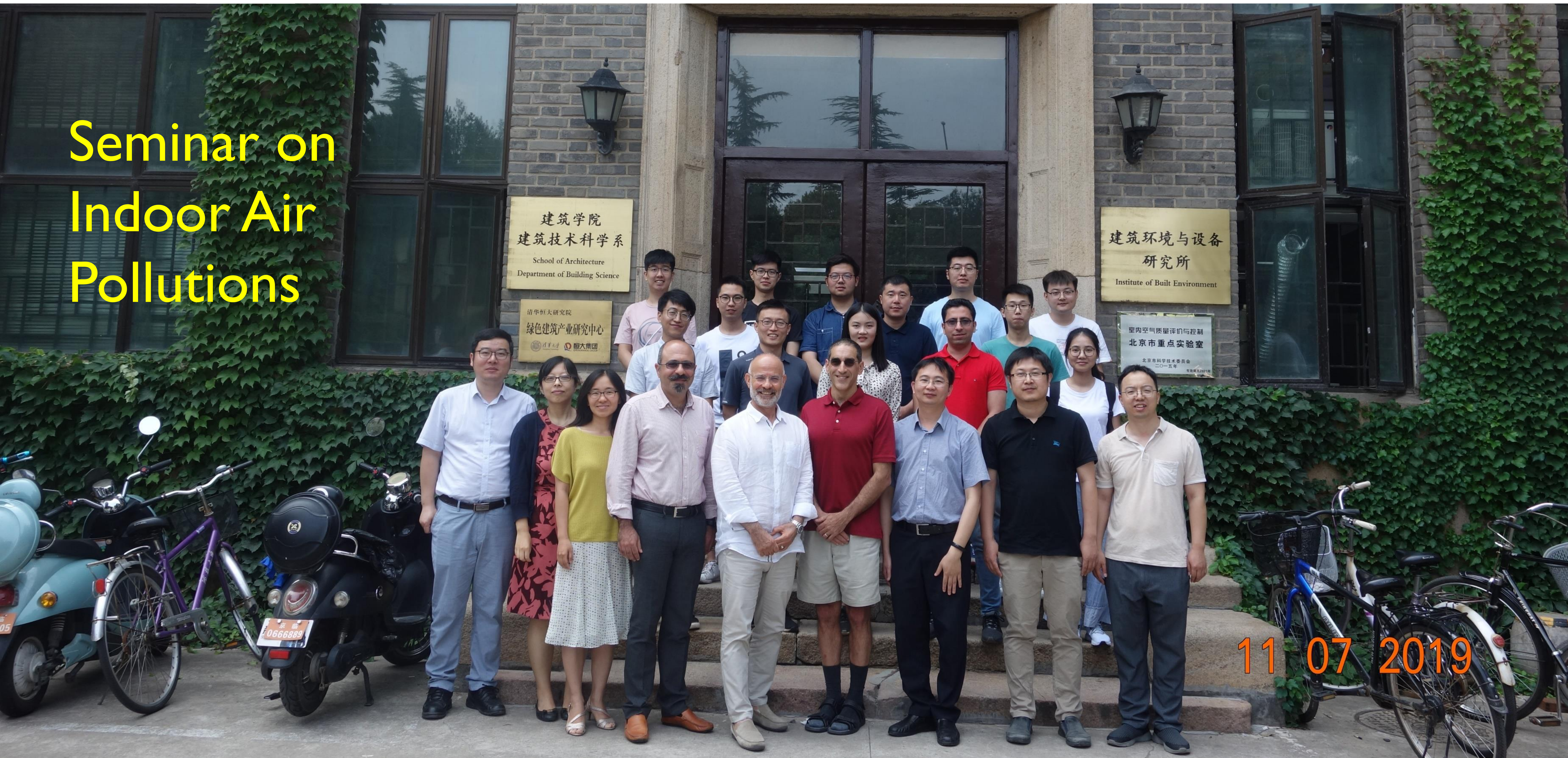


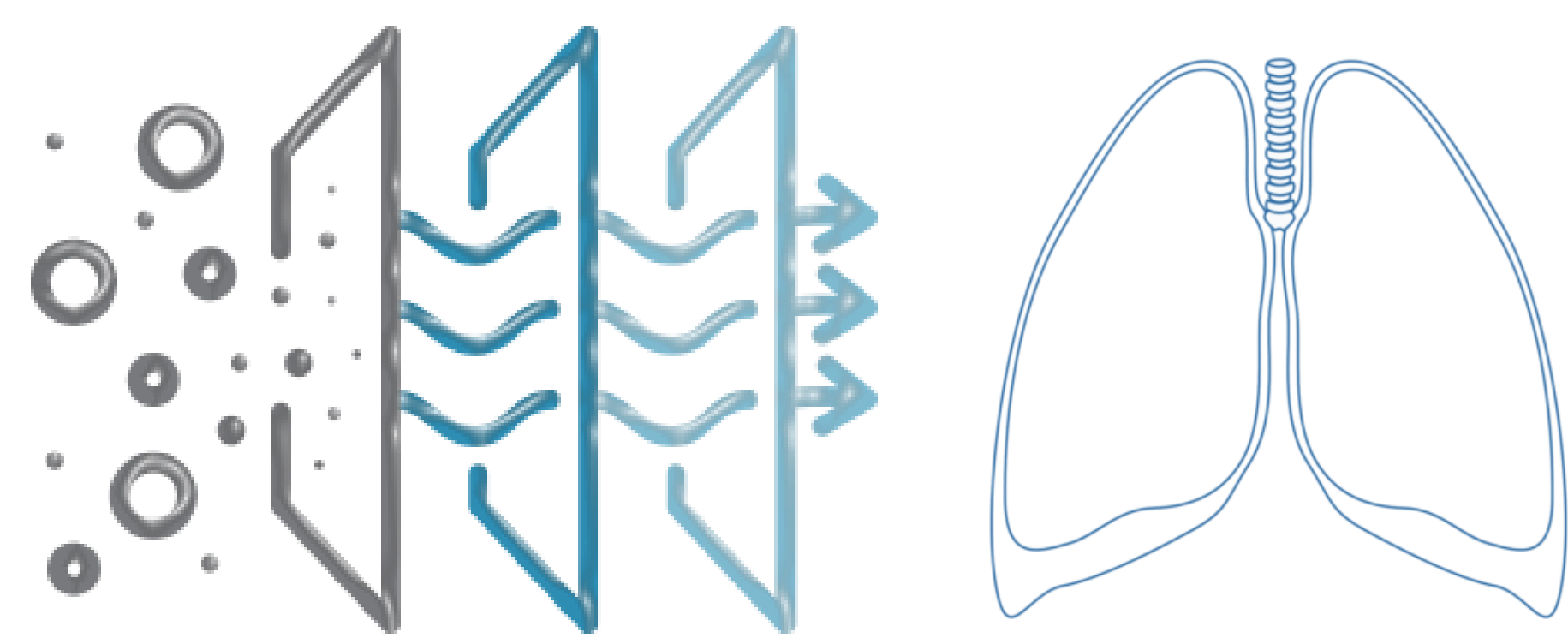
Dr. Hongyin CHEN's postdoctoral report



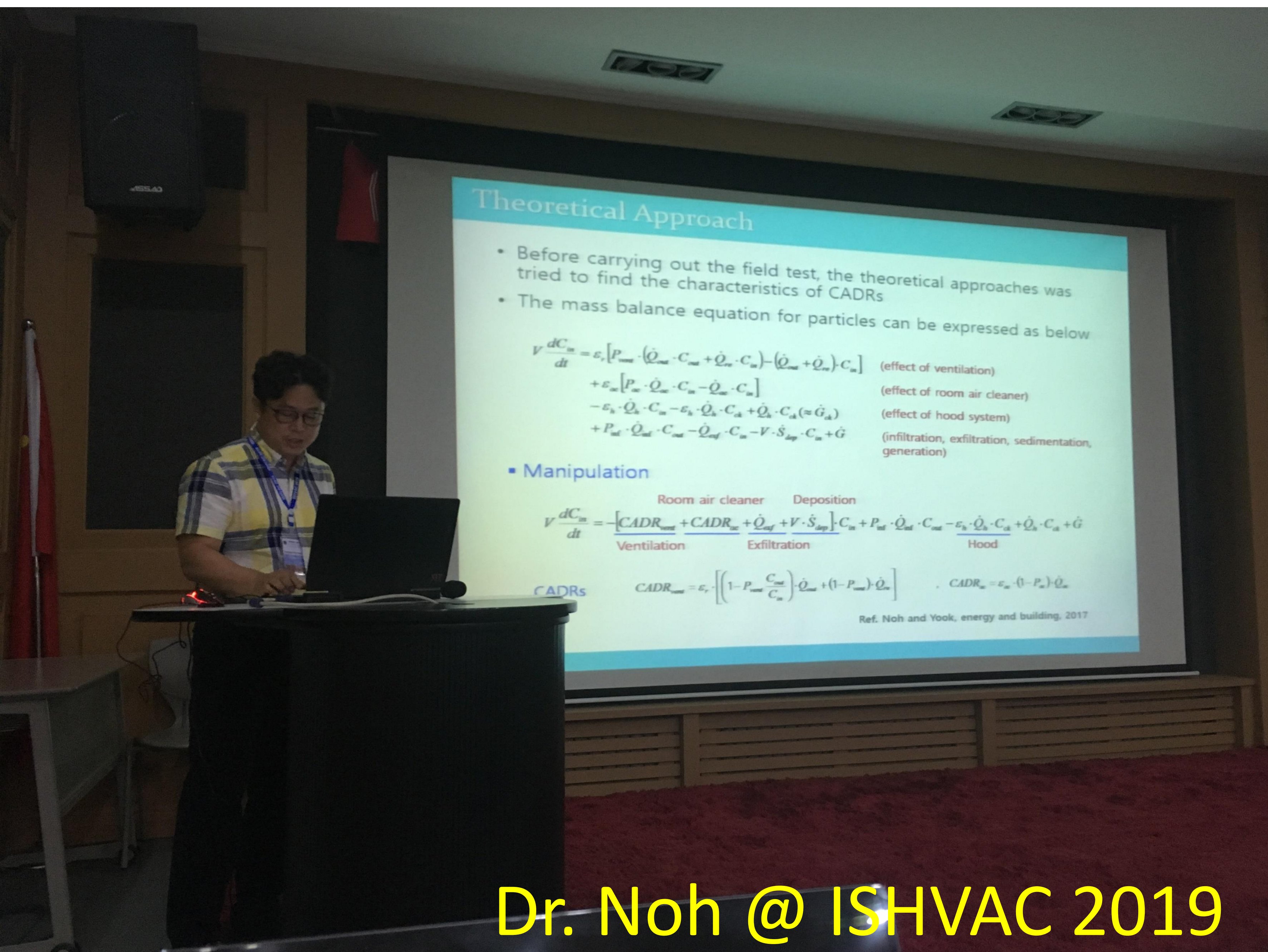
Researches Activities Funs

Seminar on Indoor Air Pollutions





Researches Activities Funs



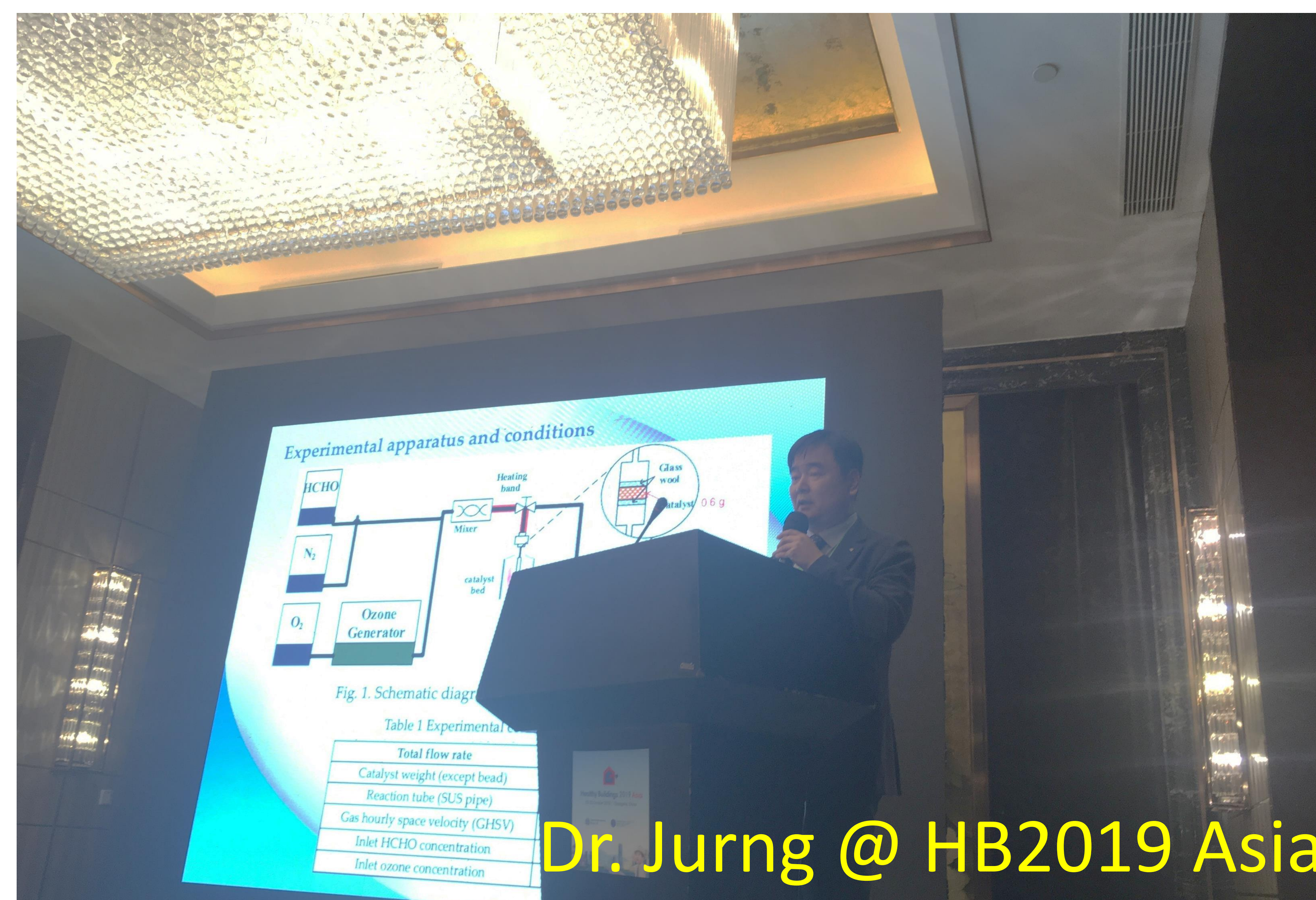
Dr. Noh @ ISHVAC 2019



China, Denmark, Japan, Korea Discussion on IEC Air Cleaner standard

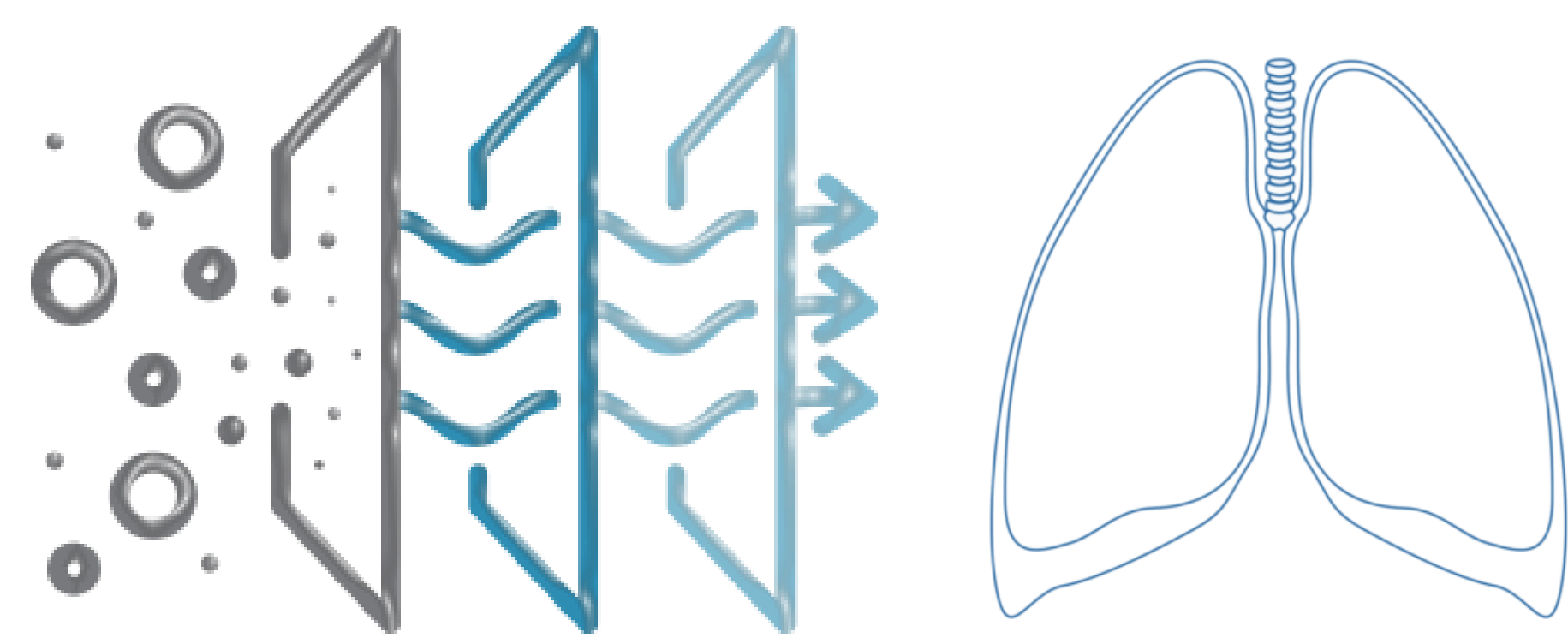


Dr. Jinhan Mo visited Daikin

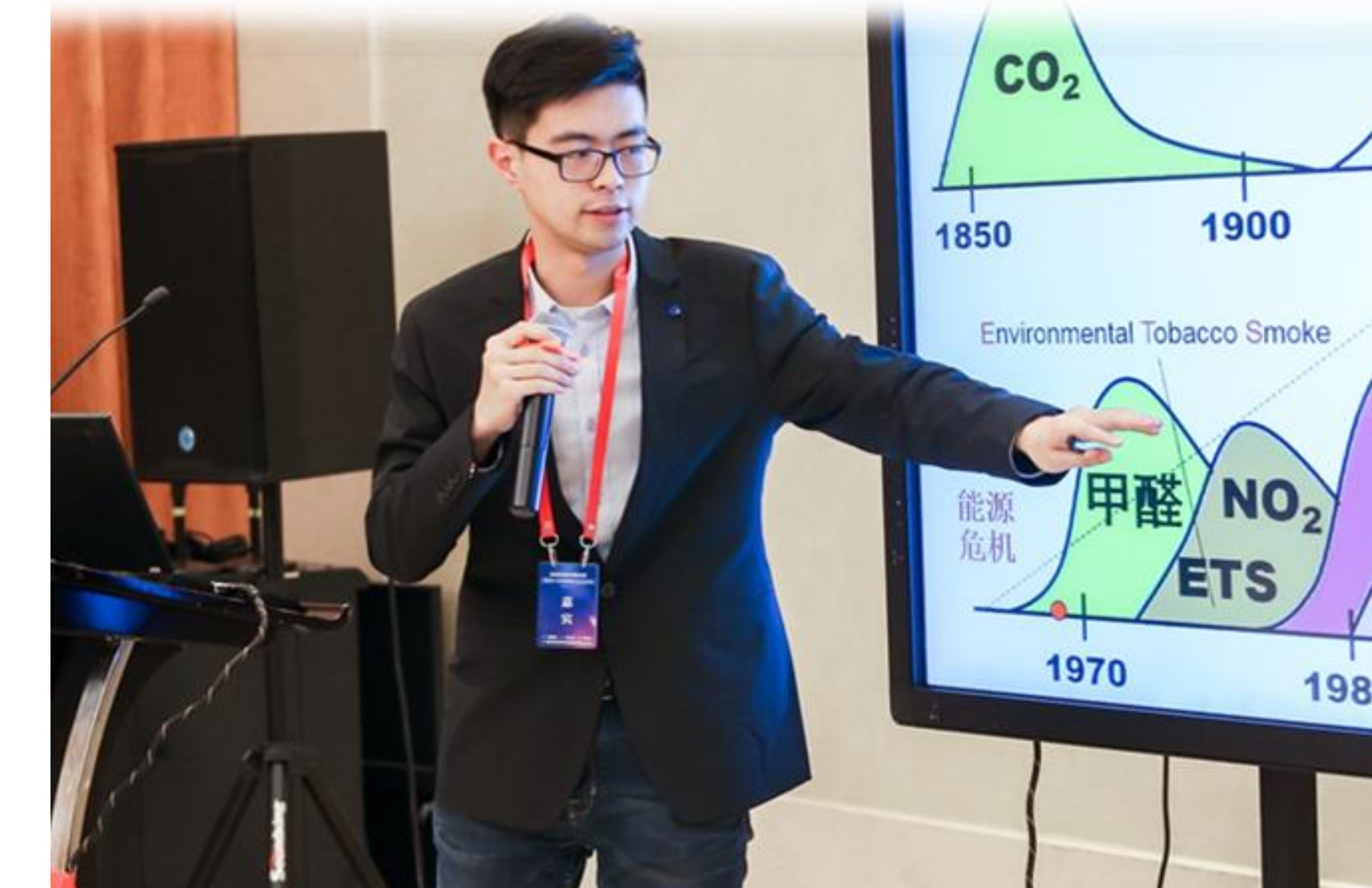
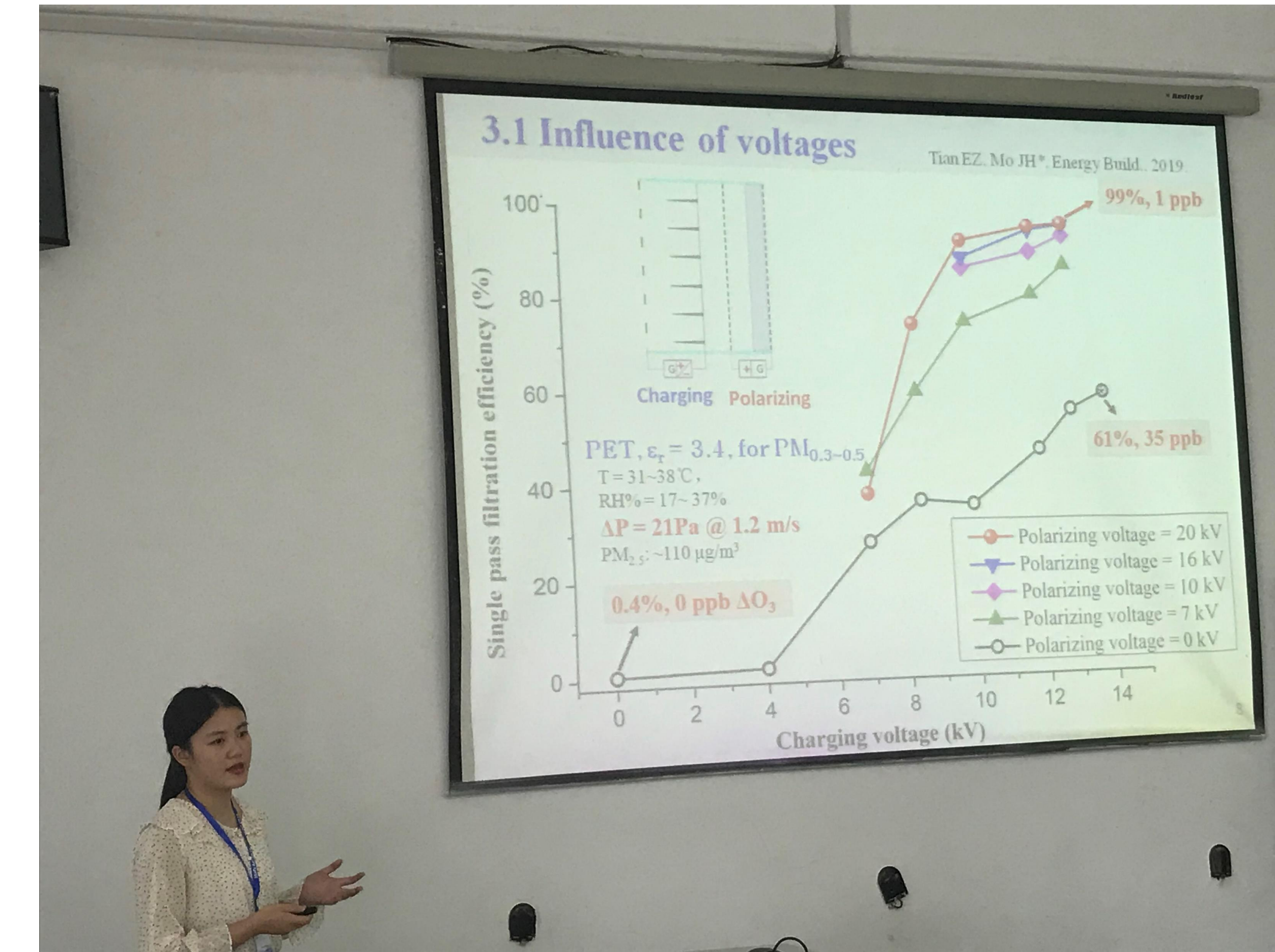


Dr. Jurng @ HB2019 Asia

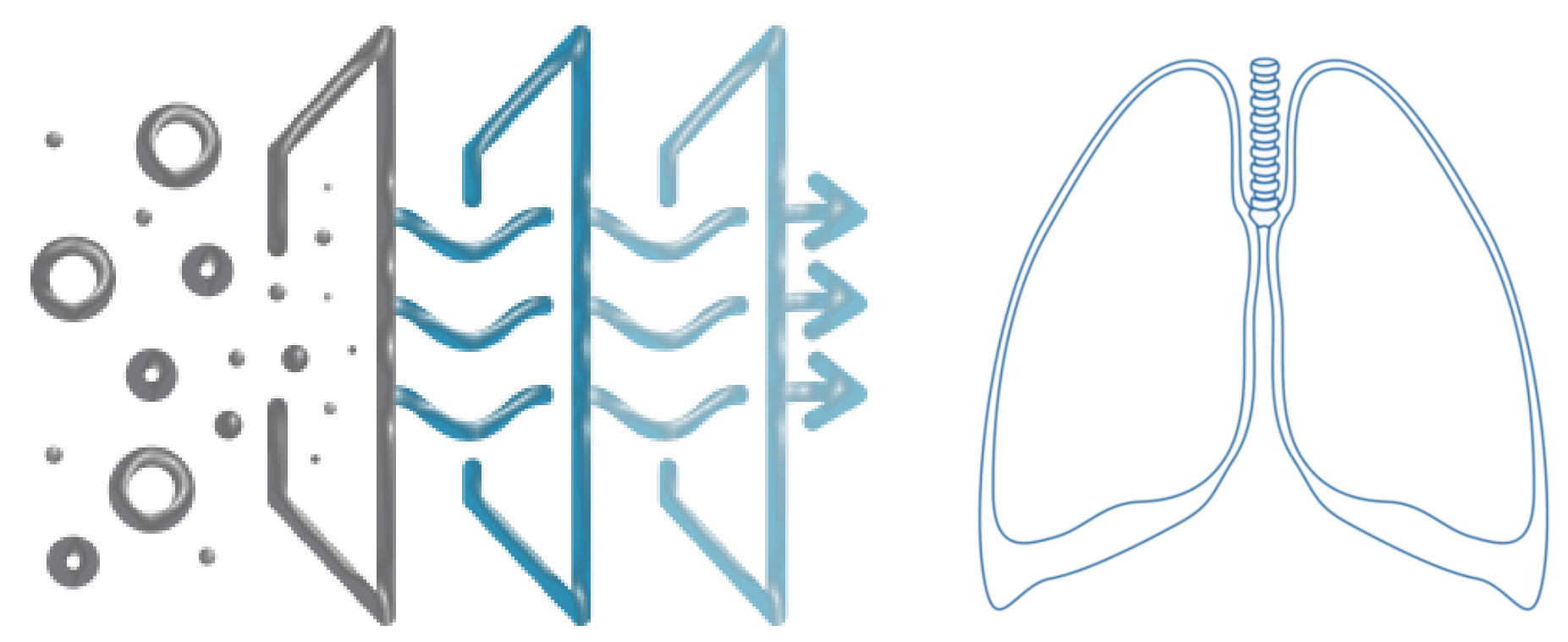




Researches Activities Funs



attended ISHVAC 2019, Harbin, China
from left to right: Zhuo CHEN, Enze TIAN, Jinhan MO,
Qiwei CHEN and Fanxuan XIA



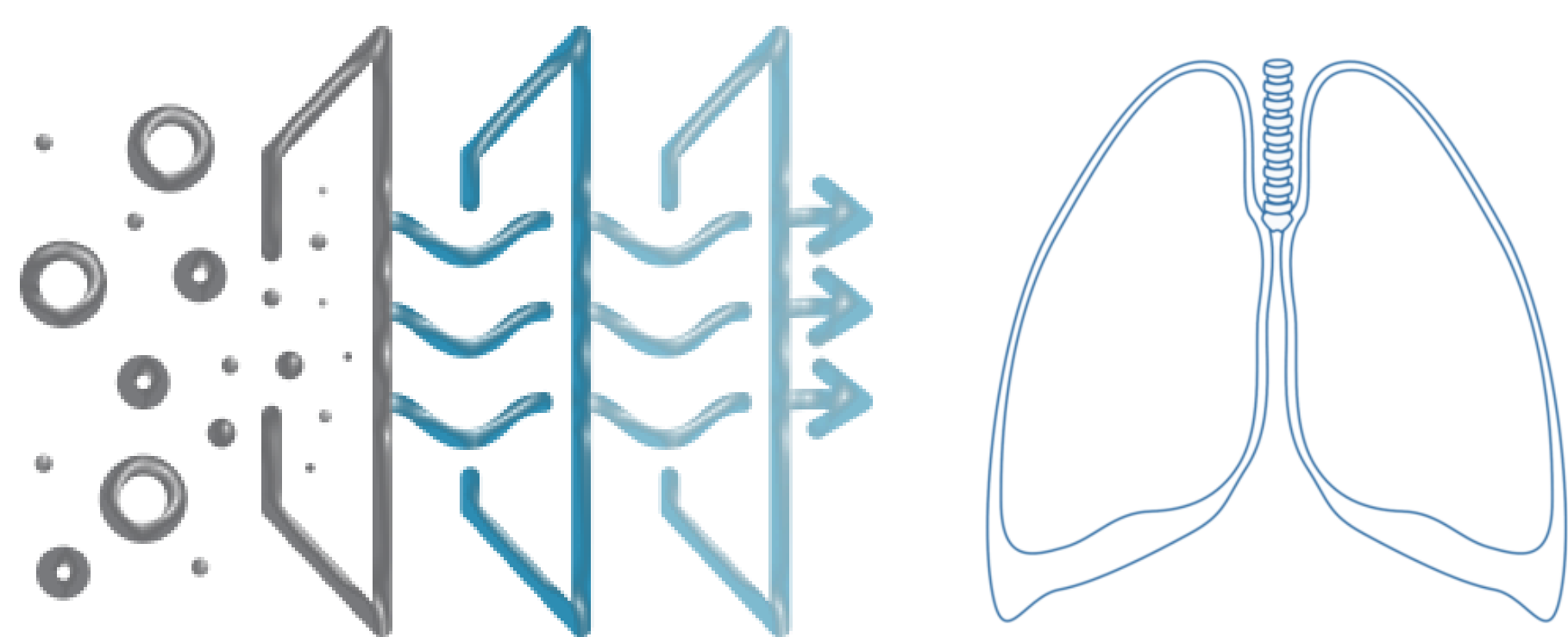
Researches Activities Funs

Prof. Lei Fang and Dr. Jinhan Mo organized a workshop titled “Indoor air cleaning: new progress” in Healthy Building 2019 Asia, Changsha, China, October 22-25.

Conference moment:
from left to right: Zhuo CHEN, Yuting GU, Jinhan MO, Qiwei CHEN, Fanxuan XIA, Yan WANG

Yan WANG from Central South University, China will join our team for her Ph.D. study on Sept. 2020





Researches Activities Funs

Yilun GAO will join our team for his Ph.D. study on Sept. 2020.



Yilun GAO and Xiao LEI got the first prize in the 12th National University Student Science Content on Energy Saving and Reduction

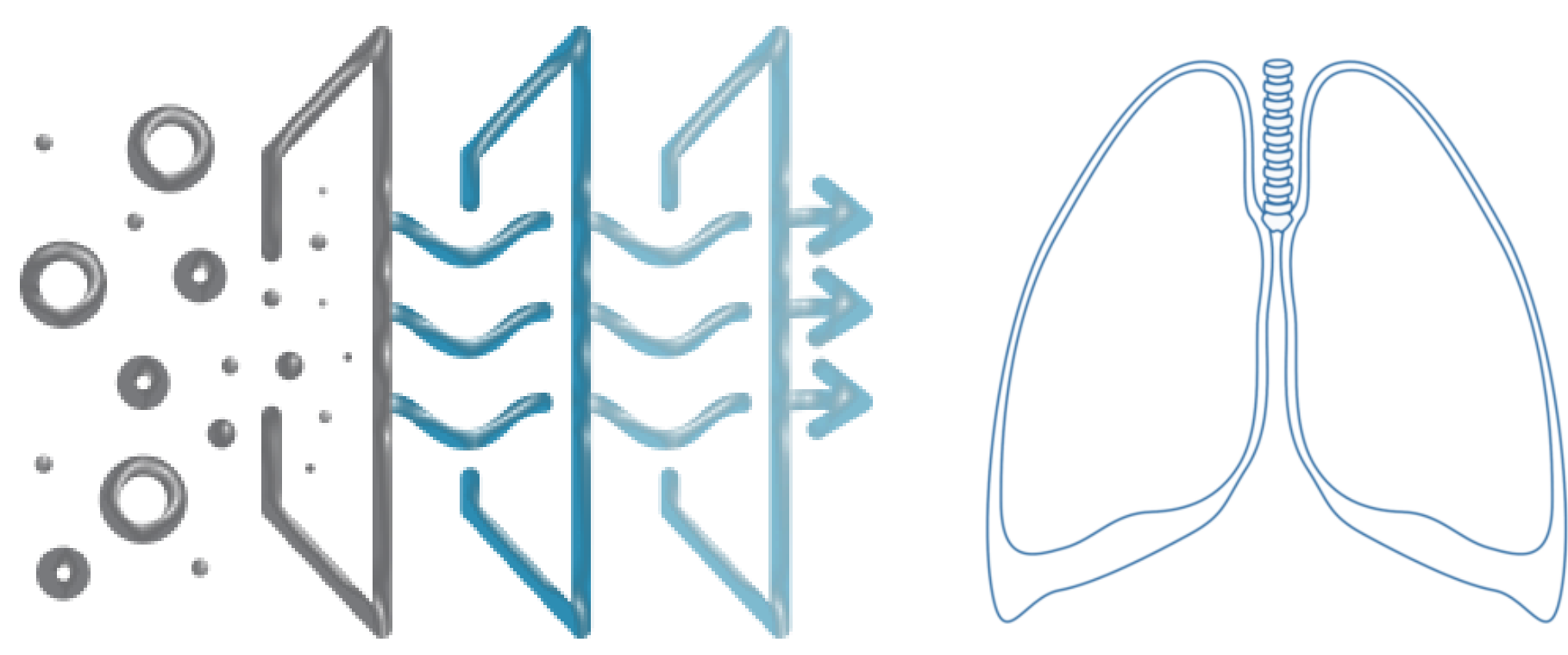


Xiao LEI got the first prize of Student Research Training (SRT) Program in Tsinghua University. Dr. Jinhan Mo got the first prize of excellent instructor.



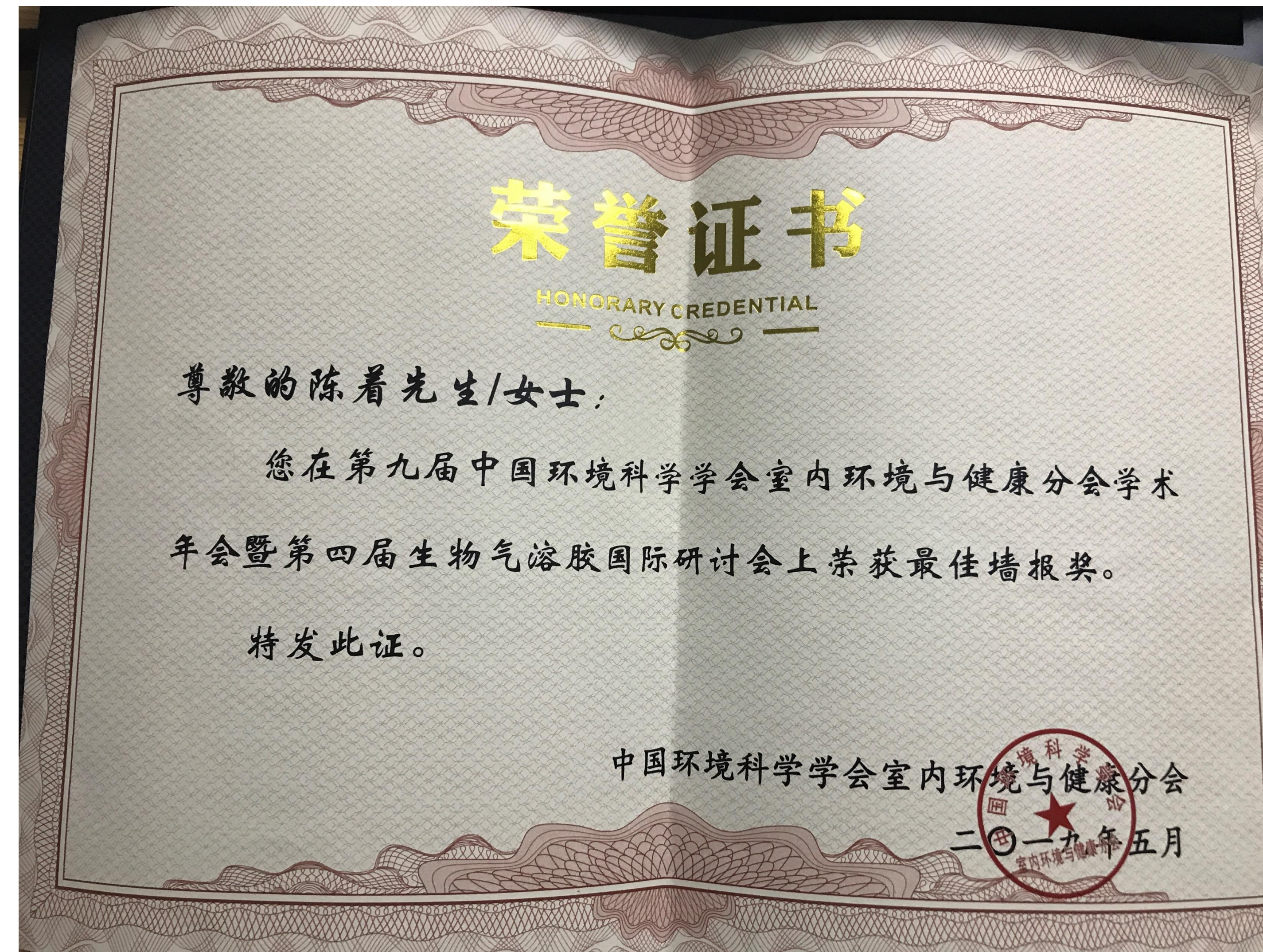
Xiao LEI will join our team for his master study on Sept. 2020.



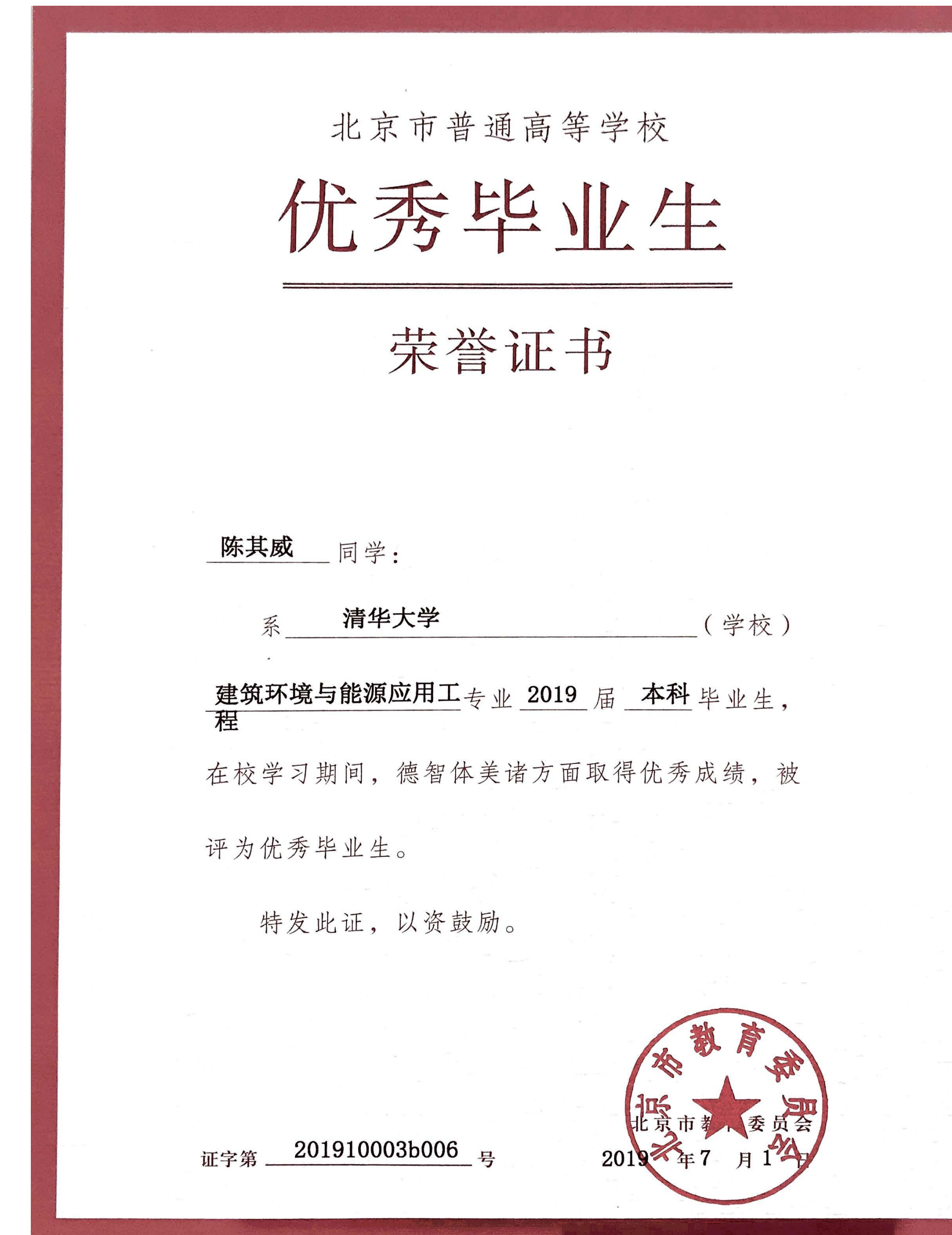
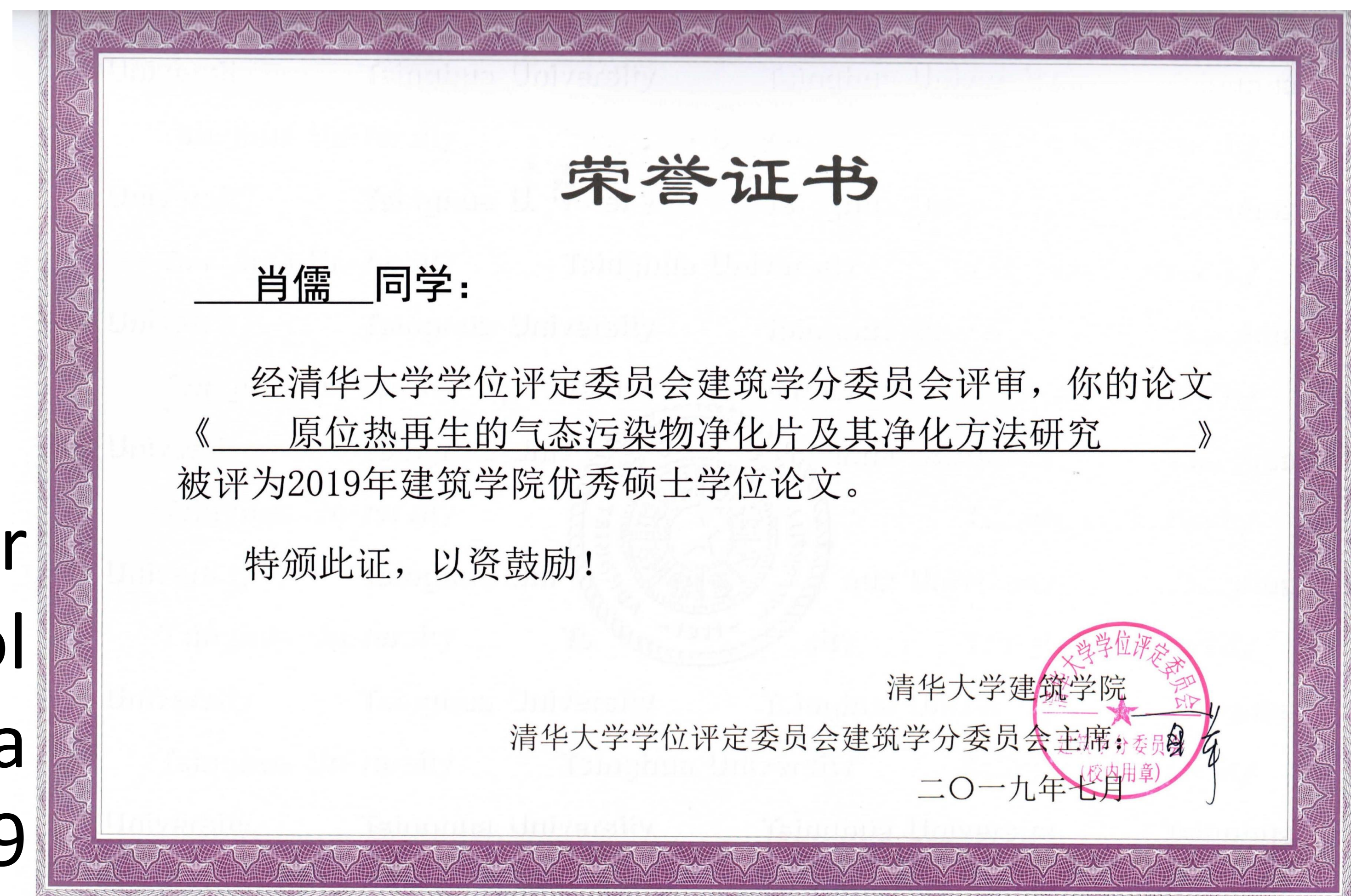


Researches Activities Funs

Zhuo CHEN got the best Poster Award at the 9th Annual Conference of the Indoor Environment and Health Branch of the China Environmental Science Society (IEHB2019)



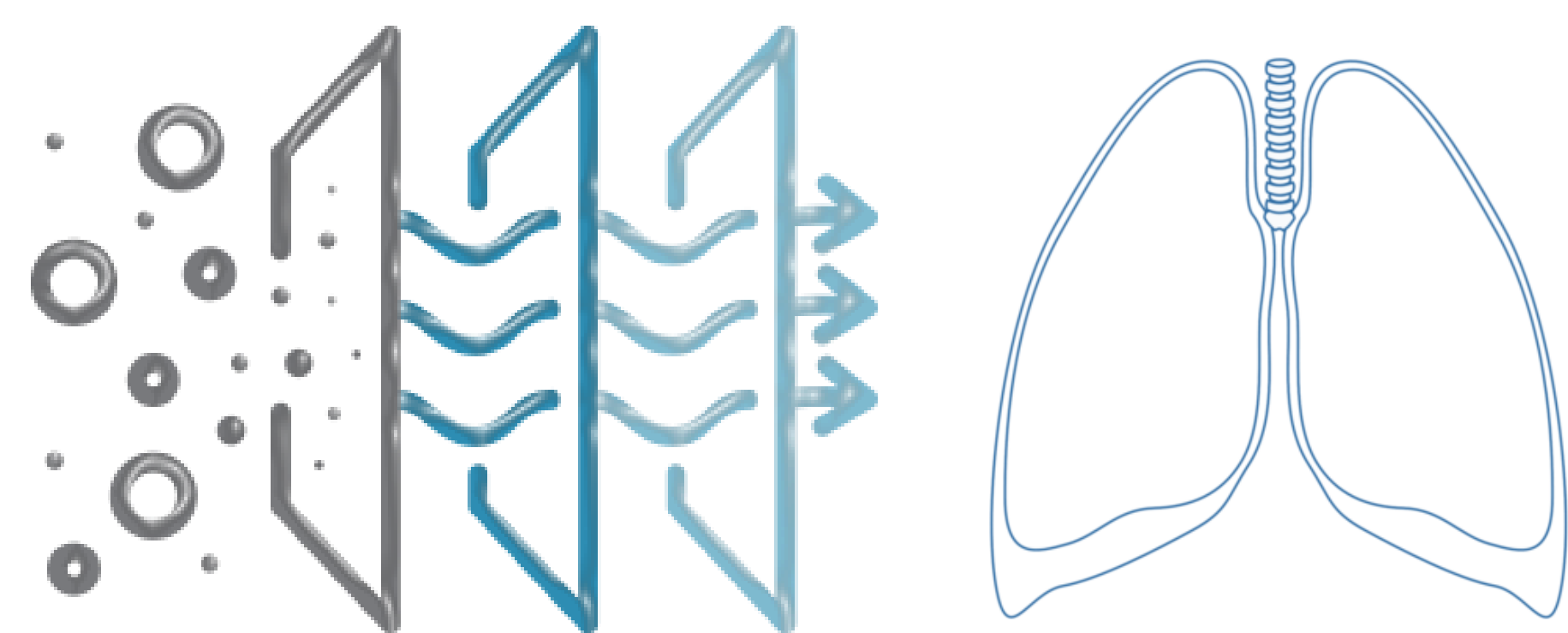
Ru XIAO got the best master dissertation award at School of Architecture, Tsinghua University, 2019



Qiwei CHEN was awarded as the outstanding graduates in Beijing

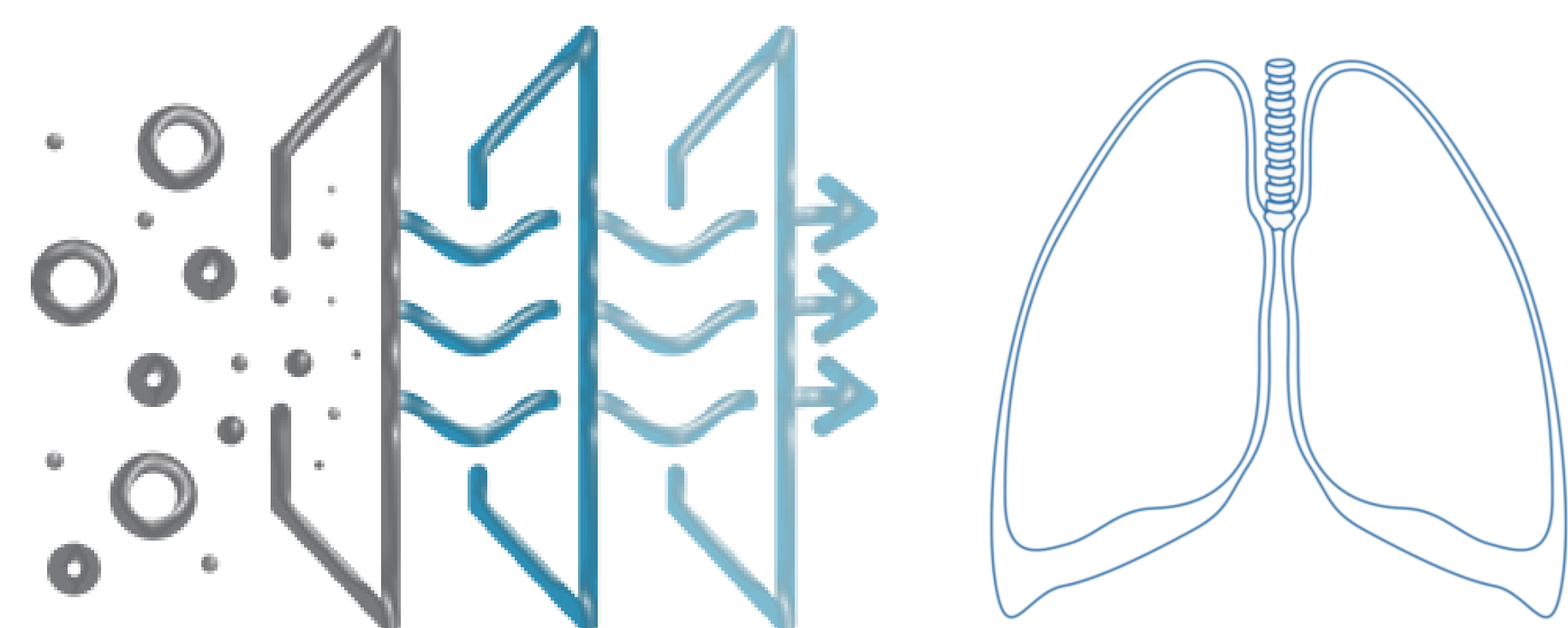


Qiwei CHEN was awarded as the outstanding graduates at Tsinghua University

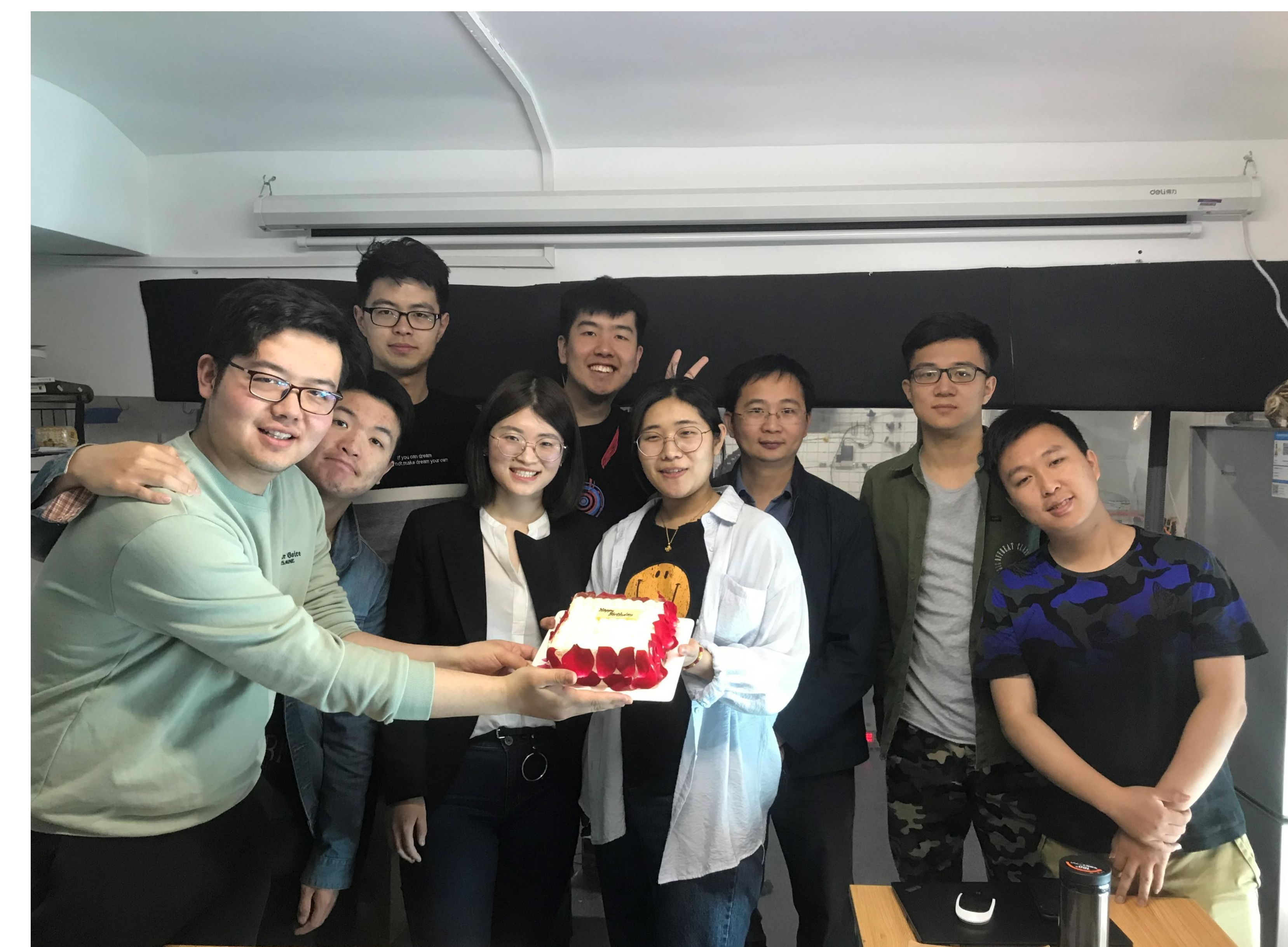


Researches Activities Funs





Researches Activities Funs



Happy New Year 2020!



Snowfall on Tsinghua, December 2019