



सत्यमेव जयते

Department of  
Science and  
Technology

**SCO –YOUNG SCIENTISTS  
CONCLAVE**

**November 24 - 28, 2020**  
**A virtual conclave**  
**CSIR – Indian Institute of Chemical Technology**  
**Hyderabad, India**



Shanghai  
Cooperation  
Organisation

**Shaping SCO-STI Partnership: Young Scientists Perspectives**

**Nomination /Registration form**  
(Separate form to be provided for each participant)

.....  
**[Name of the SCO Country]**

.....  
.....

REQUIRED DOCUMENTS

- 1) Nomination form
- 2) Nominee's Curriculum Vitae/brief Biography;
- 3) A photo of nominee (image must be larger than 250\*300 pixels)

**Last date for nomination submission:19<sup>th</sup>October, 2020**

## SCO – 1<sup>st</sup> YOUNG SCIENTISTS CONCLAVE

Shaping SCO-STI Partnership: Young Scientists Perspectives



### NOMINEE'S DETAILS/INFORMATION

Country Name : China

Last Name: Wan

First Name: Kun

Date of Birth :  
(DD/MM/YYYY)

26/09/1989

Address: No. 422, Siming South Road, Xiamen, Fujian, China. 361005

Telephone: +86-15105984897

Email: kwan@xmu.edu.cn

Title: postdoc

Gender: male

Institution/Affiliation: College of the environment and ecology, Xiamen University

Field of Science and Technology: environmental engineering

ACADEMIC QUALIFICATION: degree and discipline (please indicate where appropriate)

Degree:	Bachelors	Masters	PhD	Other
Discipline:	environmental science	environmental engineering	environmental engineering	

**Nomination Statement (up to 300 words): Please describe area of expertise in which the nominee has demonstrated innovation excellence. Please provide the information in English.**

The number of medical cases associated with antibiotic resistant bacteria (ARB) is increasing at a staggering pace. Antibiotic development has not kept up with this rise, leading to the worldwide problem of bacterial antibiotic resistance (BAR). BAR is an emerging global challenge of fundamental importance that is threatening human health, agriculture, economies and the ecosystem. It increasingly has been recognized across society, including by scientists, doctors, engineers, governments and the general public. BAR is encoded between segments of DNA called antibiotic resistance genes (ARGs), which are present in both environmental bacteria and pathogens found in the healthcare system. In recent years, ARB and ARGs have been recognized as emerging environmental contaminants.

The nominee's research focus on BAR problem in drinking water treatment and distribution system. BAR problem in drinking water was highlighted by remarkable events such as the detection of the NDM-1 gene in tap water in New Delhi, India, 2010 and of Escherichia coli carrying the extended-spectrum  $\beta$ -lactamase gene in tap water in France, 2016. The situation in China is hardly optimistic, where diverse, highly abundant ARGs have been detected in municipal drinking water. BAR is often associated with the selective pressure. In drinking water treatment and distribution systems, selective pressures such as antibiotics and heavy metals are usually present at extremely low (ppb) levels and frequently are not even detectable. Given such low selective pressures, ARB screening is rarely possible. The underlying mechanism behind this inconsistency in maintaining BAR with extremely low selective pressure is the main research interest of the nominee.

**Innovative Project Statement (up to 300 words): Please provide brief information on the nominee's innovative idea. Please provide the information in English.**

The attenuation, persistence and enrichment of ARGs or ARB in the environment are ecological processes that are affected by various factors. In addition to the known selective pressures such as antibiotics and heavy metals, other environmental factors play a major role in this process. One of such typical factors is organic carbon. Studies have found that organic carbon level in the environment will determine the fitness cost of BAR, and convincing evidence suggests that low concentration of carbon source is likely to promote both bacterial tolerance and resistance to antibiotics at the population level. Considering the fact that drinking water treatment and distribution system are typical oligotrophic environments, and the fact that nutrient concentration is constantly declining from source water to tap water, it is possible that such oligotrophic environment weaken the fitness cost of BAR and lead to the persistence of ARGs.

By using drinking water biofilters, the nominee found higher concentration of influent organic carbon led to lower diversity of bacterial community and richness of ARGs in biofilm, and discovered a negative correlation ( $p \leq 0.01$ ) between the ARG richness and the corresponding TOC level. Moreover, the absolute abundance of ARGs was positively correlated ( $p \leq 0.05$ ) with the abundance of 16S rRNA gene and was determined by the organic carbon concentration. The nominee also observed a trend in the relative abundance of ARGs, which increased with the depth of biofilters, and this trend was more pronounced in filters with low organic carbon concentrations. These results may provide new insights into the mechanism of persistent BAR in drinking water treatment and distribution system.

Participation in Innovation Competitions/Awards/Achievements: Please list previous participation in innovation competitions and awards/achievements, if any. Please provide the information in English.

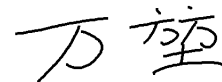
DECLARATION BY THE CANDIDATE:

I hereby declare that all the information given above is true to the best of my knowledge. I accept to participate in the virtual conference of 1<sup>st</sup> SCO -Young Scientists Conclave in India, and will attend the entire programme of five days.

Place: Xiamen, China

Date: 11/20/2020

Signature of the nominee:



Name of the nominating authority:  
(Contact details, i.e. telephone, email and designation)

Place: .....

Date: .....

Signature: .....

-----  
-----  
NB: Please remember to include the following along with Nomination Form:

- Nominee's Curriculum Vitae/Biography at the end of nomination form.