2017 ANNUAL REPORT
年度報告

海洋污染國家重點實驗室
State Key Laboratory in Marine Pollution

Original Mission

The mission of the SKLMP is to protect the marine environment of Hong Kong and South China by identifying major threats such as algal toxins and contaminants of emerging environmental concern, and developing tools and technologies to address and solve these problems.

海洋污染國家重點實驗室的使命為通過明確威脅海洋環境的主要問題，如藻毒素和新興環境污染物等，並發展相關設備和技術致力於這些問題的解決，以保護香港和華南地區的海洋安全。

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Message from the Director

2017 was very special for the State Key Laboratory in Marine Pollution (SKLMP). Not only was it our eighth anniversary, it was also the first time that external panels had officially "reviewed" our work.

A panel, most of whose members were officials from the Ministry of Science and Technology of China (MOST), met with SKLMP members on 23 May 2017. We discussed the vision, mission, and operation of partner state key laboratories in Hong Kong in general and the SKLMP in particular.

The panel offered very useful feedback. Indeed, the visit by MOST provided an excellent opportunity for us to reflect on our achievements and performance thus far and to prepare for a visit by the second panel, which comprised discipline-specific experts appointed by the Research Grants Council of Hong Kong.

This second visit, which was organized by the Innovation and Technology Commission of the Hong Kong SAR Government, took place on 12 July 2017. It involved an introductory talk by the Director of the SKLMP; presentations by young researchers; poster displays and laboratory visits; as well as a discussion session with postgraduate students.

Over the five years under review (2011–2015), the 38 members of the SKLMP published around 1,600 SCI papers and attracted more than 18,000 citations. They secured 144 new research projects with total funding of HK$151 million. Members also received National Science Awards from the MOST as well as from the Ministry of Education.

During the "exit meeting", the panel provided very positive feedback on the performance of the SKLMP. The panel also mentioned a number of issues that may/will require our continuous attention such as the relevance of the mission and vision of the SKLMP to Hong Kong and China, as well as the SKLMP's strategy to (1) ensure that the agreed research themes will be adhered to; (2) enhance the cooperation/collaboration among members from different universities; (3) recruit new/young members and retire those who are less active; and (4) provide training opportunities for young researchers, among other suggestions.

Although at the time of writing the outcome of the "review visits" has not yet been announced, it is clear that we must take seriously the issues identified by the two panels, as well as those that we have acknowledged over the years, and start a process of rejuvenation and self-strengthening to scale the SKLMP to new heights in the coming five years.

In this connection, the SKLMP is in the process of replacing some of the obsolete research equipment, much of which has been used for close to, or over, ten years. Funds will continue to be set aside to encourage collaborative research among members of different universities, while a new postgraduate scholarship will facilitate the joint supervision of PhD students by faculty across institutions.

In my view, the quantity and quality of our research output in relevant areas will continue to be one of the Key Performance Indicators for the SKLMP in the foreseeable future.

There is no doubt that challenges and obstacles exist, but with the help and good will that our members have demonstrated, I am confident that the SKLMP will continue to thrive.

Professor Paul Kwan Sing LAM
Director of the State Key Laboratory in Marine Pollution
31 December 2017

主任致辭

對於海洋污染國家重點實驗室來說，2017 年是非常特別的一年。我們不但迎來了第八個年頭，也迎來了實驗室第一次正式接受外部評審人員評估我們的工作。

在 2017 年 5 月 23 日，由多個國家科學技術部官員組成的小組會見了實驗室成員。會議期間，我們共同探討了實驗室的願景、使命和運作，並著重討論了實驗室的發展。

這個主要由科技部官員組成的評審小組給予了我們非常寶貴的意見。我們不僅藉此機會展示了迄今為止實驗室所作出的成就和貢獻，也為迎接由香港研究資助局任命的學科專家所組成的工作小組的視察做好準備。

由香港特別行政區創新科技署組織的第二次視察於 2017 年 7 月 12 日舉行。這次視察程序包括實驗室主任介紹實驗室整體目標、方向、最近進度及未來計劃，青年科研人員發表簡報，海報展示與參觀實驗室，以及與實驗室的研究生們進行了學術交流。

回顧過去五年，從 2011 年到 2015 年，實驗室 38 名成員共發表了大約 1600 篇 SCI 論文，被引用超過 18000 次。同時，他們還獲得了 144 個新的研究項目，總資助額為港幣 1.51 億。更值一提的是，成員們還獲得了由科技部和教育部頒發的國家科學獎。

在結束訪問時，評審小組對實驗室給予了正面的評價，並且提出了一些我們需要繼續關注的事項，例如實驗室的願景和使命與香港和中國大陸的相關性，實驗室的未來策略以（1）確保研究範疇與協議所訂立的方向一致；（2）加強不同成員院校之間的合作與交流；（3）招募新或年輕的科研人員，剔除比較不活躍的成員；（4）為年輕科研人員提供更多培訓機會等。

儘管評審結果在撮寫這篇序言時還未公佈，但我們仍需要認真地對待這兩次視察時評審小組所給予的意見以及過去幾年我們一直面對但還未解決的問題，透過不斷奮鬥和努力，使實驗室在未來五年更上一層樓。

現階段，實驗室正陸續更換一些過時的研究設備，因大部份已經使用接近甚至超過十年了。我們將繼續撥出資金，鼓勵不同大學成員之間的合作研究。同時，我們亦已經新設立了研究生獎學金，以促進各院校對博士生的聯合培養。

我認為在相關研究領域中研究成果的數量和質量，將會繼續成為實驗室未來五年的關鍵績效指標之一。

毫無疑問，我們面前仍有很多挑戰和障礙，但在實驗室成員的衷誠合作下，我相信實驗室將會更茁壯成長。

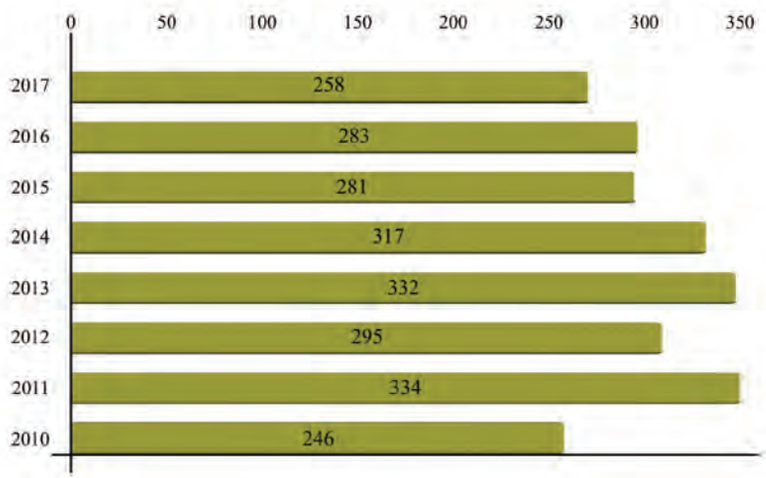
林群聲
海洋污染國家重點實驗室主任
二零一七年十二月三十一日

Research Performance and Contributions
研究水平和貢獻

Research Scopes in SKLMP 實驗室研究範疇

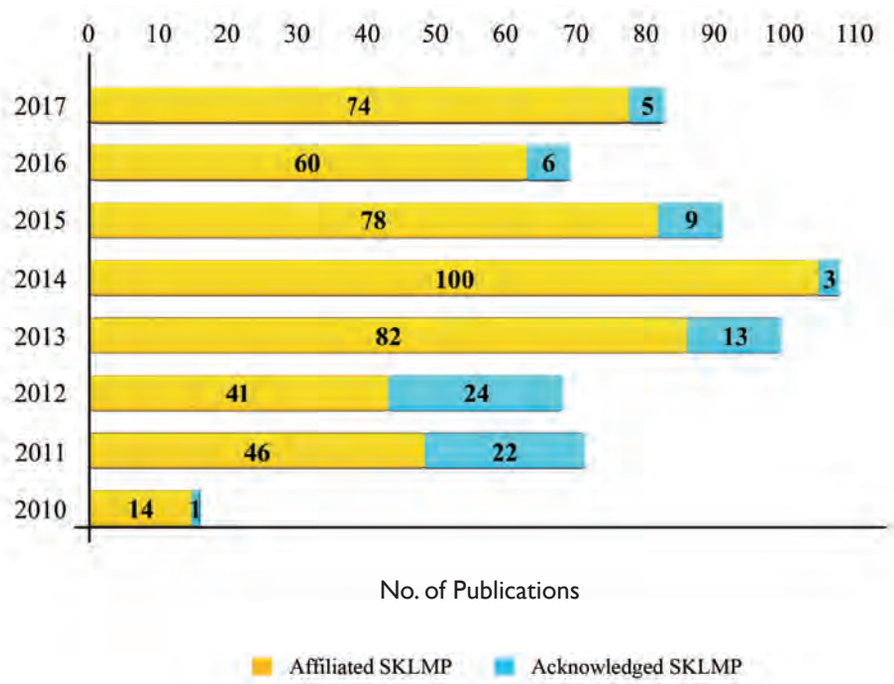
List of Peer-Reviewed Papers 論文專著

Number of SCI publications of SKLMP members(2010-2017)
2010-2017 年 SKLMP members 的 SCI 論文數目



No. of Publications

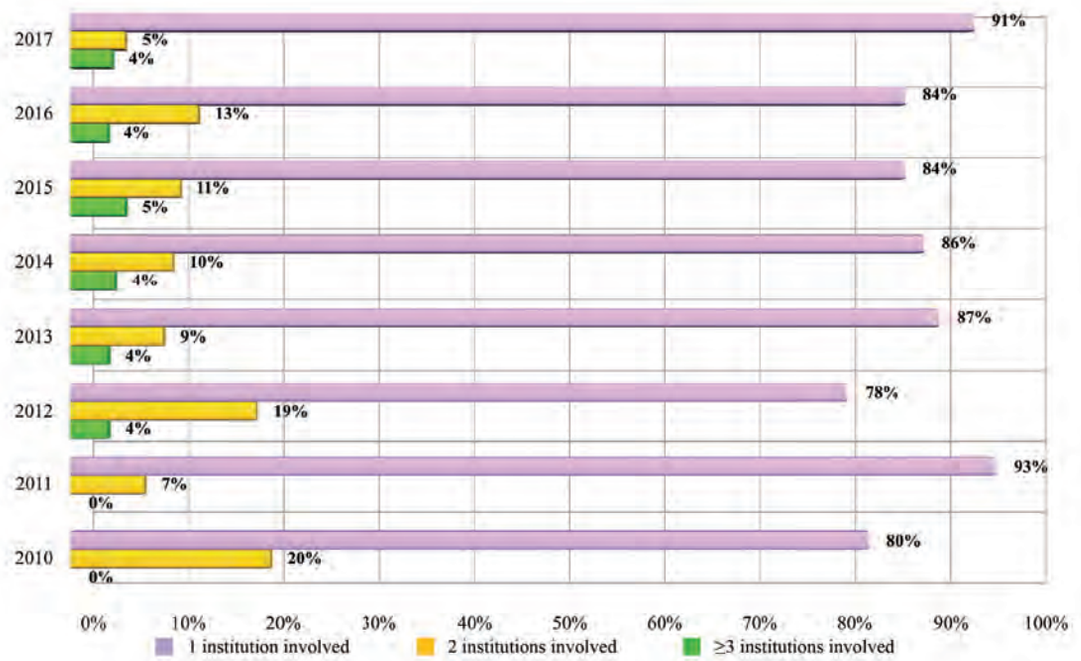
Number of SCI publications of SKLMP (2010-2017)
2010-2017 年 SKLMP 的 SCI 論文數目



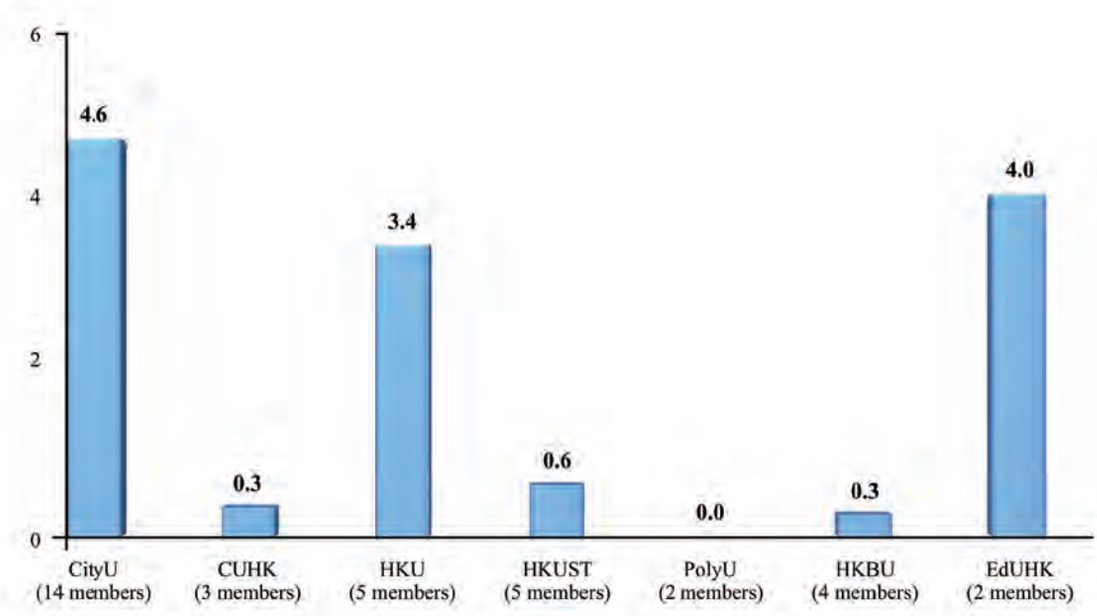
No. of Publications

Affiliated SKLMP Acknowledged SKLMP

Degree of collaboration among member institutions based on SCI publications (2010-2017)
2010-2017 年成員院校合作發表 SCI 文章的情況



Average active index # of 7 institutions (2017)
成員院校的活躍指數（2017）



Average active index = SCI publications / members per institution
平均活躍指數= SCI 文章數目 ／ 院校成員人數

(I) Papers with the SKLMP included as the first affiliation:
以 SKLMP 為第一作者單位的期刊論文

1 Seemann, F., Jeong, C. B., Zhang, G., Wan, M. T., Guo, B., Peterson, D. R., Lee, J. S., **Au, D.W. T.**(2017)
Ancestral benzo[a]pyrene exposure affects bone integrity in F3 adult fish (*Oryzias latipes*).
Aquatic Toxicology, 183: 127-134.

2 Dong, M., Seemann, F., Humble, J. L., Liang, Y., Peterson, D. R., Ye, R., Ren, H., Kim, H. S., Lee, J. S., **Au, D.W.T.**, Lam, Y.W. (2017)
Modification of the plasma complement protein profile by exogenous estrogens is indicative of a compromised immune competence in marine medaka (*Oryzias melastigma*).
Fish and Shellfish Immunology, 70: 260-269.

3 Seemann, F., Peterson, D. R., Chiang, M.W. L., **Au, D.W.T.** (2017)
The development of cellular immune defence in marine medaka *Oryzias melastigma*.
Comparative Biochemistry and Physiology - Part C: Toxicology & Pharmacology, 199: 81-89.

4 Yip, B.W., Mok, H. O., Peterson, D. R., Wan, M. T., Taniguchi, Y., Ge, W., **Au, D.W.T.** (2017)
Sex-dependent telomere shortening, telomerase activity and oxidative damage in marine medaka *Oryzias melastigma* during aging.
Marine Pollution Bulletin, 124: 701-709.

5 Roy, R.Y., Peterson, D. R., Seemann, F., Kitamura, S. I., Lee, J. S., Lau, T. C., Tsui, S. K., **Au, D.W.T.** (2017)
Immune competence assessment in marine medaka (*Orzyias melastigma*) - a holistic approach for immunotoxicology.
Environmental Science and Pollution Research, 24: 27687-27701.

6 Mak, M.Y. L., Li, J., Liu, C. N., **Cheng, S.H., Lam, P.K.S.**, Cheng, J., **Chan, L.L.** (2017)
Physiological and behavioural impacts of Pacific ciguatoxin-1 (P-CTX-1) on marine medaka (*Oryzias melastigma*).
Journal of Hazardous Materials, 321:782-790

7 Wartenberg, R., Feng, L., Wu, J. J., Mak, M.Y. L., **Chan, L.L.**, Telfer, T. C., **Lam, P.K.S.** (2017)
The impacts of suspended mariculture on coastal zones in China and the scope for Integrated Multi-Trophic Aquaculture.
Ecosystem Health and Sustainability, 3: 1340268.

8 Tan, T., Yu, R. M. K., **Wu, R.S.S.**, **Kong, R.Y.C.** (2017)
Overexpression and knockdown of hypoxia-inducible factor 1 disrupt the expression of steroidogenic enzyme genes and early embryonic development in zebrafish.
Gene Regulation and Systems Biology, 11: 1-11.

9 Ho, K. L., Yuen, K. K., Yau, M. S., Murphy, M. B., Wan, Y., Fong, B. M., Tam, S., Giesy, J. P., Leung, K. S., **Lam, M.H.W.** (2017)
Glucuronide and sulfate conjugates of bisphenol A: Chemical synthesis and correlation between their urinary levels and plasma bisphenol A content in voluntary human donors.
Archives of Environmental Contamination and Toxicology, 73: 410-420.

10 Ho, K. L., Yuen, K. K., Yau, M. S., Murphy, M. B., Wan, Y., Fong, B. M.W., Tam, S., Giesy, J. P., Leung, K. S.Y., **Lam, M.H.W.** (2017)
Glucuronide and sulfate conjugates of tetrabromobisphenol A (TBBPA): Chemical synthesis and correlation between their urinary levels and plasma TBBPA content in voluntary human donors.
Environment International, 98: 46-53.

11 Lei, E. N.Y., Yau, M. S., Yeung, C. C., Murphy, M. B., Wong, K. L., **Lam, M.H.W.** (2017)
Profiling of selected functional metabolites in the central nervous system of marine medaka (*Oryzias melastigma*) for environmental neurotoxicological assessments.
Archives of Environmental Contamination and Toxicology, 72(2), 269-280.

12 Yan, M., Leung, P.T.Y., Ip, J. C.H., Cheng, J. P., Wu, J. J., Gu, J. R., **Lam, P.K.S.** (2017)
Developmental toxicity and molecular responses of marine medaka (*Oryzias melastigma*) embryos to ciguatoxin P-CTX-1 exposure.
Aquatic Toxicology, 185: 149-159.

13 Leung, P.T.Y., Yan, M., Yiu, S. K. F., Lam, V.T.T., Ip, J. C. H., Au, M.W.Y., Chen, C.Y., **Wai, T.C.**, **Lam, P.K.S.** (2017)
Molecular phylogeny and toxicity of harmful benthic dinoflagellates *Coolia* (Ostreopsidaceae, Dinophyceae) in a sub-tropical marine ecosystem: The first record from Hong Kong.
Marine Pollution Bulletin, 124: 878-889.

14 Tsui, M. M. P., **Lam, J.C.W.**, Ng, T.Y., **Ang, P.O.**, Murphy, M. B., **Lam, P.K.S.** (2017)
Occurrence, distribution, and fate of organic UV filters in coral communities.
Environmental Science & Technology, 51: 4182-4190.

15 Zeng, L., **Lam, J.C.W.**, Horii, Y., Li, X., Chen, W., **Qiu, J.W.**, **Leung, K.M.Y.**, Yamazaki, E., Yamashita, N., **Lam, P.K.S.** (2017)
Spatial and temporal trends of short-and medium-chain chlorinated paraffins in sediments off the urbanized coastal zones in China and Japan: A comparison study.
Environmental Pollution, 224: 357-367.

16 Wu, Q., **Lam, J.C.W.**, Kwok, K.Y., Tsui, M. M. P., **Lam, P.K.S.** (2017)
Occurrence and fate of endogenous steroid hormones, alkylphenol ethoxylates, bisphenol A and phthalates in municipal sewage treatment systems.
Journal of Environmental Sciences, 61: 49-58.

17 Chen, L., **Lam, J.C.W.** (2017)
SeaNine 211 as antifouling biocide: A coastal pollutant of emerging concern.
Journal of Environmental Sciences, 61: 68-79.

(II) Papers with the SKLMP as one of the affiliations:
以 SKLMP 為作者單位之一的期刊論文

1 Chen, L., **Au, D.W.T.**, Hu, C., Peterson, D. R., Zhou, B., **Qian, P.Y.** (2017)
Identification of molecular targets for 4,5-dichloro-2-*n*-octyl-4-isothiazolin-3-one (DCOIT) in teleosts: New insight into mechanism of toxicity.
Environmental Science & Technology, 51: 1840-1847.

2 Chen, L., **Au, D.W.T.**, Hu, C., Zhang, W., Zhou, B., Cai, L., Giesy, J. P., **Qian, P.Y.** (2017)
Linking genomic responses of gonads with reproductive impairment in marine medaka (*Oryzias melastigma*) exposed chronically to the chemopreventive and antifouling agent, 3,3'-diindolylmethane (DIM).
Aquatic Toxicology, 183: 135-143.

3 Tan, W., Witten, P., Winkler, C., **Au, D.W.T.**, Huysseune, A. (2017)
Telomerase expression in medaka (*Oryzias melastigma*) pharyngeal teeth.
Journal of Dental Research, 96: 678-684.

4 Dai, X., Mak, M.Y. L., Lu, C. K., Mei, H. H., Wu, J. J., Lee, W. H., **Chan, L.L.**, Lim, P.T., Mustapa, N. I., Lim, H. C., Wolf, M., Li, D., Luo, Z., Gu, H., Leaw, C. P., Lu, D. (2017)
Taxonomic assignment of the benthic toxigenic dinoflagellate *Gambierdiscus* sp. type 6 as *Gambierdiscus balechii* (Dinophyceae), including its distribution and ciguatoxicity.
Harmful Algae, 67: 107-118.

5 Catania, D., Richlen, M. L., Mak, M.Y. L., Morton, S. L., Laban, E. H., Xu, Y., Anderson, D. M., **Chan, L.L.**, Berumen, M. L. (2017)
The prevalence of benthic dinoflagellates associated with ciguatera fish poisoning in the central Red Sea.
Harmful Algae, 68: 206-216.

6 Wang, J., Cao, B., Yang, X.W., Wu, J.J., **Chan, L.L.**, **Li, Y.** (2017)
Chronic ciguatoxin poisoning causes emotional and cognitive dysfunctions in rats.
Toxicological Research, 6: 179-187.

7 Kwan, B. K.Y., Cheung, J. H.Y., Law, A. C. K., **Cheung, S.G.**, Shin, P. K.S. (2017)
Conservation education program for threatened Asian horseshoe crabs: A step towards reducing community apathy to environmental conservation.
Journal for Nature Conservation, 35: 53-65.

8 Kwan, B. K.Y., Chan, A. K.Y., **Cheung, S.G.**, Shin, P. K.S. (2017)
Marine microalgae as dietary supplements in the culture of juvenile Chinese horseshoe crabs, *Tachypleus tridentatus* (Xiphosura).
Aquaculture Research, 48: 3910-3924.

9 Xu, X.Y., Lee, W.T., Chan, A. K.Y., Lo, H. S., Shin, P. K.S., **Cheung, S.G.** (2017)
Microplastic ingestion reduces energy intake in the clam *Atactodea striata*.
Marine Pollution Bulletin, 124: 798-802.

10 Xu, X., Yip, K., Shin, P.K.S., **Cheung, S.G.** (2017)
Predator–prey interaction between muricid gastropods and mussels under ocean acidification.
Marine Pollution Bulletin, 124: 911-916.

11 Wang, J., Liu, G., Liu, H., **Lam, P.K.S.** (2017)
Multivariate statistical evaluation of dissolved trace elements and a water quality assessment in the middle reaches of Huaihe River, Anhui, China.
Science of the Total Environment, 583: 421-431.

12 Zhang, K., Xiong, X., Hu, H., Wu, C., Bi, Y., Wu, Y., Zhou, B., **Lam, P.K.S.**, Liu, J. (2017)
Occurrence and characteristics of microplastic pollution in Xiangxi Bay of Three Gorges Reservoir, China.
Environmental Science & Technology, 51: 3794-3801.

13 Tang, J., Zhu, N., Zhu, Y., Liu, J., Wu, C., Kerr, P., Wu, Y., **Lam, P.K.S.** (2017)
Responses of periphyton to Fe_2O_3 nanoparticles: A physiological and ecological basis for defending nanotoxicity.
Environmental Science & Technology, 51: 10797-10805.

14 Pan, X.R., Wang, Y.K., Li, W.W., Wang, Y.S., Wang, X., Cheng, Y., Geng, Y.K., Li, C.X., **Lam, P.K.S.**, Yu, H.Q. (2017)
Selective co-production of acetate and methane from wastewater during mesophilic anaerobic fermentation under acidic conditions.
Environmental Science: Water Research & Technology, 3: 720-725.

15 Liu, H. Q., **Lam, J.C.W.**, Li, W.W., Yu, H. Q., **Lam, P.K.S.** (2017)
Spatial distribution and removal performance of pharmaceuticals in municipal wastewater treatment plants in China.
Science of the Total Environment, 586: 1162-1169.

16 Zhou, C., Liu, G., Xu, Z., Sun, H., **Lam, P.K.S.** (2017)
The retention mechanism, transformation behavior and environmental implication of trace element during co-combustion coal gangue with soybean stalk.
Fuel, 189: 32-38.

17 Zeng, L., **Lam, J.C.W.**, Chen, H., Du, B., **Leung, K.M.Y.**, **Lam, P.K.S.** (2017)
Tracking dietary sources of short-and medium-chain chlorinated paraffins in marine mammals through a subtropical marine food web.
Environmental Science & Technology, 51: 9543-9552.

18 Wang, J., Liu, G., Liu, H., **Lam, P.K.S.** (2017)
Tracking historical mobility behavior and sources of lead in the 59-year sediment core from the Huaihe River using lead isotopic compositions.
Chemosphere, 184: 584-593.

19 Chen, L., Wang, X., Zhang, X., **Lam, P.K.S.**, Guo, Y., **Lam, J.C.W.**, Zhou, B. (2017)
Transgenerational endocrine disruption and neurotoxicity in zebrafish larvae after parental exposure to binary mixtures of decabromodiphenyl ether (BDE-209) and lead.
Environmental Pollution, 230: 96-106.

20 Liu, Y., Liu, G., Yuan, Z., Liu, H., **Lam, P.K.S.** (2017)
Presence of arsenic, mercury and vanadium in aquatic organisms of Laizhou Bay and their potential health risk.
Marine Pollution Bulletin, 125: 334-340.

21 Zhou, C., Liu, G., Xu, Z., Sun, H., **Lam, P.K.S.** (2017)
Effect of ash composition on the partitioning of arsenic during fluidized bed combustion.
Fuel, 204: 91-97.

22 Kumar, G., Au, N. P. B., Lei, E. N.Y., Mak, Y. L., Chan, L. L. H., **Lam, M.H.W.**, **Chan, L.L.**, **Lam, P.K.S.**, **Ma, E.C.H.** (2017)
Acute exposure to Pacific ciguatoxin reduces electroencephalogram activity and disrupts neurotransmitter metabolic pathways in motor cortex.
Molecular Neurobiology, 54: 5590-5603.

23 Ding, J., Lu, Y. Z., Fu, L., Ding, Z. W., Mu, Y., **Cheng, S.H.**, Zeng, R. J. (2017)
Decoupling of DAMO archaea from DAMO bacteria in a methane-driven microbial fuel cell.
Water Research, 110: 112-119.

24 Ng, C.Y., **Cheng, S.H.**, **Yu, P.K.N.** (2017)
Effect of photon hormesis on dose responses to alpha particles in zebrafish embryos.
International Journal of Molecular Sciences, 18: 385.

25 Ng, C.Y. P., **Cheng, S.H.**, **Yu, P.K.N.** (2017)
Photon hormesis deactivates alpha-particle induced bystander effects between zebrafish embryos.
Radiation Physics and Chemistry, 133: 72-80.

26 Li, Y., Zhang, P., Yan, S., Xu, J., Niaz, S., Chand, R., **Ma, E.C.H.**, Lin, Y., Li, J., Liu, L. (2017)
Atranones with enhancement neurite outgrowth capacities from the crinoid-derived fungus *stachybotrys chartarum* 952.
Tetrahedron, 73: 7260-7266.

27 Au, N. P. B., **Ma, E.C.H.** (2017)
Recent advances in the study of bipolar/rod-shaped microglia and their roles in neurodegeneration.
Frontiers in Aging Neuroscience, 9: 128.

28 He, H., **Tam, N.F.Y.**, Yao, A., Qiu, R., Li, W. C., Ye, Z. (2017)
Growth and Cd uptake by rice (*Oryza sativa*) in acidic and Cd-contaminated paddy soils amended with steel slag.
Chemosphere, 189: 247-254.

29 Pi, N., Wu, Y., Zhu, H. W., Wong, Y. S., **Tam, N.F.Y.** (2017)
The uptake of mixed PAHs and PBDEs in wastewater by mangrove plants under different tidal flushing regimes.
Environmental Pollution, 231 (Pt 1): 104-114.

30 Yuan, K., Xiao, S., Jiang, X., Yang, L., Chen, B., Luan, T., Lin, L., **Tam, N.F.Y.** (2017)
Effects of endocrine disrupting chemicals (EDCs) on bacterial communities in mangrove sediments.
Marine Pollution Bulletin, 122: 122-128.

31 Pan, Y., Chen, J., Zhou, H., Farzana, S., **Tam, N.F.Y.** (2017)
Vertical distribution of dehalogenating bacteria in mangrove sediment and their potential to remove polybrominated diphenyl ether contamination.
Marine Pollution Bulletin, 124: 1055-1062.

32 Farzana, S., Chen, J., Pan, Y., Wong, Y. S., **Tam, N.F.Y.** (2017)
Antioxidative response of *Kandelia obovata*, a true mangrove species, to polybrominated diphenyl ethers (BDE-99 and BDE-209) during germination and early growth.
Marine Pollution Bulletin, 124: 1063-1070.

33 Wang, P., Wong, Y. S., **Tam, N.FY.** (2017)
Green microalgae in removal and biotransformation of estradiol and ethinylestradiol.
Journal of Applied Phycology, 29: 263-273.

34 Gao, Q. T., Wong, Y. S., **Tam, N.F.Y.** (2017)
Antioxidant responses of different microalgal species to nonylphenol-induced oxidative stress.
Journal of Applied Phycology, 29: 1317-1329.

35 Shahmohammadi Beni, M., Krstic, D., Nikezic, D., **Yu, P.K.N.** (2017)
Realistic dosimetry for studies on biological responses to X-rays and γ-rays.
Journal of Radiation Research, 58: 729-736.

36 Nikezic, D., **Yu, P.K.N.** (2017)
Alpha-particle fluence in radiobiological experiments.
Journal of Radiation Research, 58: 195-200.

37 Shahmohammadi Beni, M., Hau, T. C., Krstic, D., Nikezic, D., **Yu, P.K.N.** (2017)
Monte Carlo studies on neutron interactions in radiobiological experiments.
PLoS One, 12: e0181281.

38 Chan, P. M., Ng, C. Y. P., Shahmohammadi Beni, M., Law, S. S., **Yu, P.K.N.** (2017)
Auto-development issue in quality assurance of biological X-ray irradiator using Gafchromic EBT3 film.
Results in Physics, 7: 444-445.

39 Man, Y. B., Chow, K. L., Cheng, Z., Mo, W.Y., Chan, Y. H., **Lam, J.C.W.**, Lau, F.T., Fung, W. C., Wong, M. H. (2017)
Profiles and removal efficiency of polycyclic aromatic hydrocarbons by two different types of sewage treatment plants in Hong Kong.
Journal of Environmental Sciences, 53: 196-206.

40 Wang, Z., **Leung, K.M.Y.**, Li, X., Zhang, T., **Qiu, J.W.** (2017)
Macrobenthic communities in Hong Kong waters: Comparison between 2001 and 2012 and potential link to pollution control.
Marine Pollution Bulletin, 124: 694-700.

41 Wong, Y. M., Li, R., Lee, C. K. F., Wan, H. T., **Wong, C.K.C.** (2017)
The measurement of bisphenol A and its analogues, perfluorinated compounds in twenty species of freshwater and marine fishes, a time-trend comparison and human health based assessment.
Marine Pollution Bulletin, 124: 743-752.

42 Chen, L., **Qian, P.Y.** (2017)
Review on molecular mechanisms of antifouling compounds: An update since 2012.
Marine Drugs, 15: 264.

43 Han, P., Klumper, U., Wong, A., Li, M., Lin, J. G., Quan, Z., Denecke, M., **Gu, J.D.** (2017)
Assessment of molecular detection of anaerobic ammonium-oxidizing (anammox) bacteria in different environmental samples using PCR primers based on 16S rRNA and functional genes.
Applied Microbiology and Biotechnology, 101: 7689-7702.

44 Chen, J., **Gu, J.D.** (2017)
Faunal burrows alter the diversity, abundance, and structure of AOA, AOB, anammox and n-damo communities in coastal mangrove sediments.
Microbial Ecology, 74: 140-156.

45 Meng, H., Yang, Y.C., Lin, J.G., Denecke, M., **Gu, J.D.** (2017)
Occurrence of anammox bacteria in a traditional full-scale wastewater treatment plant and successful inoculation for new establishment.
International Biodeterioration & Biodegradation, 120: 224-231.

46 Yi, X., **Leung, K.M.Y.** (2017)
Assessing the toxicity of triphenyltin to different life stages of the marine medaka *Oryzias melastigma* through a series of life-cycle based experiments.
Marine Pollution Bulletin, 124: 847-855.

47 Yi, X., Bao, V. W. W., **Leung, K.M.Y.** (2017)
Binary mixture toxicities of triphenyltin with tributyltin or copper to five marine organisms: Implications on environmental risk assessment.
Marine Pollution Bulletin, 124: 839-846.

48 Yung, M. M. N., Kwok, K. W. H., Djurisic, A. B., Giesy, J. P., **Leung, K.M.Y.** (2017)
Influences of temperature and salinity on physicochemical properties and toxicity of zinc oxide nanoparticles to the marine diatom *Thalassiosira pseudonana*.
Scientific Reports, 7: 3662.

49 Sun, P.Y., Foley, H. B., Wu, L., Nguyen, C., Chaudhry, S., Bao, V. W. W., **Leung, K.M.Y.**, Edmands, S. (2017)
Long-term laboratory culture causes contrasting shifts in tolerance to two marine pollutants in copepods of the genus *Tigriopus*.
Environmental Science and Pollution Research: 1-10.

50 Leung, P. T. Y., Yi, A. X., Ip, J. C. H., Mak, S. S. T., **Leung, K.M.Y.** (2017)
Photosynthetic and transcriptional responses of the marine diatom *Thalassiosira pseudonana* to the combined effect of temperature stress and copper exposure.
Marine Pollution Bulletin, 124: 938-945.

51 Yung, M. M. N., Fougeres, P. A., Leung, Y. H., Liu, F., Djurisic, A. B., Giesy, J. P., **Leung, K.M.Y.** (2017)
Physicochemical characteristics and toxicity of surface-modified zinc oxide nanoparticles to freshwater and marine microalgae.
Scientific Reports, 7: 15909.

52 Ho, K. K. Y., **Leung, K.M.Y.** (2017)
Population dynamics of the rock shell *Reishia clavigera* associated with different degrees of organotin contamination in Hong Kong.
Marine Pollution Bulletin, 124: 827-834.

53 Lai, R. W. S., Yeung, K. W. Y., Yung, M. M. N., Djurisic, A. B., Giesy, J. P., **Leung, K.M.Y.** (2017)
Regulation of engineered nanomaterials: Current challenges, insights and future directions.
Environmental Science and Pollution Research: 1-18.

54 Yeung, J. W. Y., Zhou, G. J., **Leung, K.M.Y.** (2017)
Spatiotemporal variations in metal accumulation, RNA/DNA ratio and energy reserve in *Perna viridis* transplanted along a marine pollution gradient in Hong Kong.
Marine Pollution Bulletin, 124: 736-742.

55 Astudillo, J. C., Bonebrake, T. C., **Leung, K.M.Y.** (2017)
The recently introduced *bivalve Xenostrobus* securis has higher thermal and salinity tolerance than the native *Brachidontes variabilis* and established *Mytilopsis sallei*.
Marine Pollution Bulletin, 118: 229-236.

56 Bao, V. W. W., Ho, K. K. Y., Lai, K. K. Y., Mak, Y. K. Y., Mak, E. P. Y., Zhou, G. J., Giesy, J. P., **Leung, K.M.Y.** (2017)
Water–effect ratio of copper and its application on setting site-specific water quality criteria for protecting marine ecosystems of Hong Kong.
Environmental Science and Pollution Research: 1-13.

57 Ng, T. P., Cheng, M. C., Ho, K. K., Lui, G. C., **Leung, K.M.Y.**, Williams, G. A. (2017)
Hong Kong's rich marine biodiversity: The unseen wealth of South China's megalopolis.
Biodiversity and Conservation, 26: 23-36.

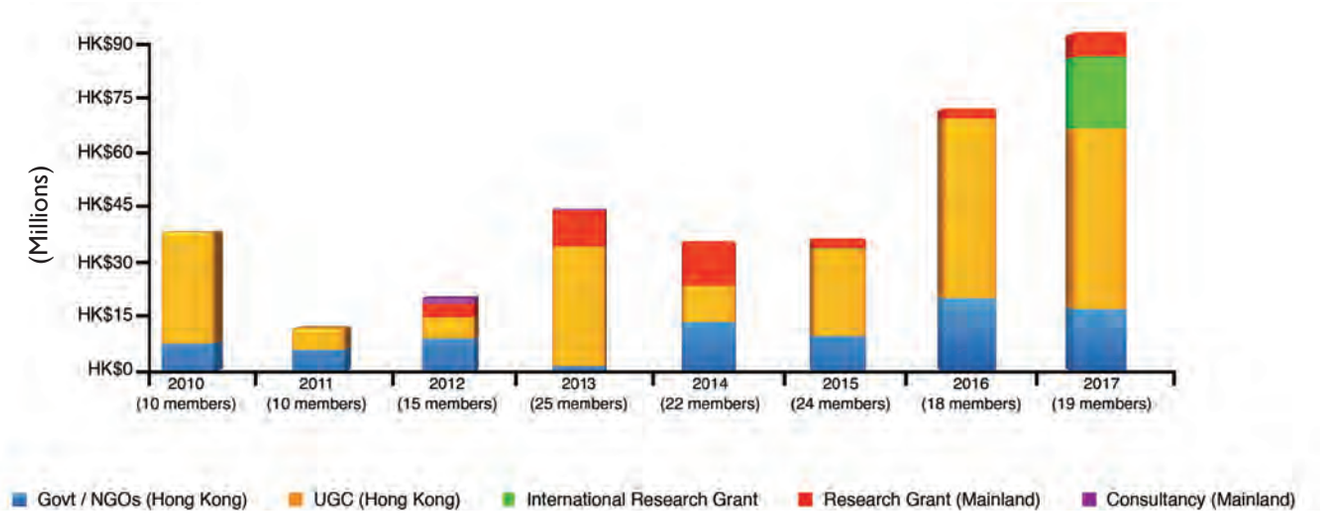
(III) Highly cited publication of SKLMP members
SKLMP 成員高引論文

1 Ming,L., Jin, L., Li, J., Fu, P.,Yang,W., Liu, D., Zhan, G.,Wang, Z., **Li, X.D.** (2017)
PM2.5 in the Yangtze River Delta, China_Chemical compositions, seasonal variations, and regional pollution events.
Environmental Pollution, 1: 1-13.

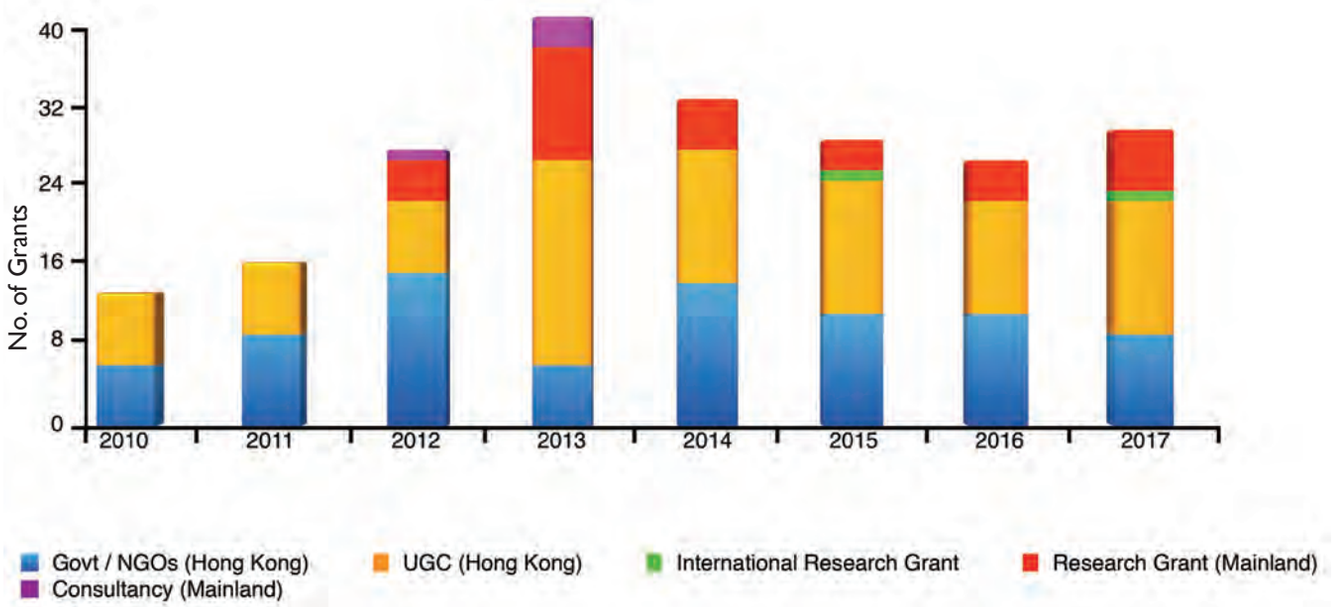
Overview of Research Grants 研究資助概況

Competitive External Research Grants 外部的研究資助

Amount of Competitive External Research Grants (2010-2017)
2010-2017 外部的研究資助總額



Number of Competitive External Research Grants (2010-2017)
2010-2017 外部的研究資助項目統計



* Research output information provided by members.

Number of members in 2010-2012:	CityU (13), CUHK (3), HKU (5), HKUST (6), PolyU (1), HKBU (2), XMU (1)
Number of members in 2013:	CityU (18), CUHK (2), HKU (5), HKUST (5), PolyU (1), HKBU (7), XMU (1)
Number of members in 2014:	CityU (18), CUHK (2), HKU (5), HKUST (5), PolyU (1), HKBU (5), XMU (1)
Number of members in 2015:	CityU (17), CUHK (1), HKU (6), HKUST (5), PolyU (1), HKBU (4), XMU (1)
Number of members in 2016:	CityU (16), CUHK (1), HKU (5), HKUST (5), PolyU (1), HKBU (4), EdUHK (2), XMU (1)
Number of members in 2017:	CityU (14), CUHK (3), HKU (5), HKUST (5), PolyU (2), HKBU (4), EdUHK (2), XMU (1)

1CNY=1.2HKD (2017)

* 項目名稱以中文譯本為準　　#Person with underline is SKLMP member

Grants from Hong Kong 香港科研資助

Government / Non-governmental Organization 政府部門／公益項目

	Project Title * 項目名稱	Grant Type 資助類型	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
	2017			
1	Provision of Consultancy Services for a study of reef fish diversity in Hong Kong 香港珊瑚魚多樣性顧問項目	Agriculture, Fisheries and Conservation Department 漁農自然護理署	**Chan, L.L.** Ang, P.O.	2,970,000
2	Guide to Marine Macrophytes and Invertebrates of Hong Kong (Part 1) 香港海洋大型植物和無脊椎動物指南 (第 1 部分)	Environment and Conservation Fund 環境及自然保育基金	**Ang, P.O.** Cheang, C.C. Tsang, L.M. Wai, T.C.	2,802,660
3	The Impacts of Eutrophication and Harmful Benthic Microalgal Blooms on Coastal Coral Reef Ecosystems with Using the CISME Device and Molecular Techniques as Complimentary Research Tools 通過 CISME 設備和分子技術研究富營養化和有害底棲微藻爆發對沿海珊瑚礁生態系統的影響	Advanced Study Institute, Croucher Foundation 裘槎基金會	**Chan, L.L.**	410,000
4	Budding Horseshoe Crab Conservationists Training Programme 馬蹄蟹保育大使訓練計劃	Ocean Park Conservation Foundation Hong Kong 香港海洋公園保育基金	**Lee, C.G.W.** Cheung, S.G.	230,800
5	Conceptual Scheme for Full-scale Implementation of Eco-shoreline at Taishan Receptor Site 台山廢物處置區內之生態海岸線的設計概念及方案研究	Civil Engineering and Development Department 土木工程拓展署	**Leung, K.M.Y.** Lai, V.C.S.	150,000
6	Provision of Service for Species Identification by DNA Test 通過 DNA 測試提供物種鑑定服務	Agriculture, Fisheries and Conservation Department 漁農自然護理署	**Lam, P.K.S.** Leung, P.T.Y. Wai, T.C. Shao, K.T.	325,000
7	Establishment and Demonstration of Recirculation Aquaculture System for Fry Culture on Rafts 魚排上建立示範及教育單位，展示商業上可行的循環海水育苗系統	Agriculture, Fisheries and Conservation Department Sustainable Fisheries Development Fund 漁農自然護理署漁業持續發展基金	**Lam, P.K.S.** Wai, T.C. Chan, L.L. Leung, K.W.	3,778,880

8	Assessing the Marine Biodiversity and Ecology of Tolo Harbour and Channel, with Particular Reference to Coastal Marine Environments of Ting Kok and Shuen Wan Hoi – Phase II (ECF 79/2016) 吐露港及赤門海峽（特別是汀角和船灣海沿岸海洋環境）的海洋生態及生物多樣性研究 - 第二階段研究 (ECF 79/2016)	Environment and Conservation Fund 環境及自然保育基金	**Williams, G.A.** Ang, P.O. Lam, P.K.S. Leung, K.M.Y. Leung, P.T.Y. Liu, H.B. Qiu, J.W. Wai, T.C. Yasuhara M. Russell B.D. Dingle C.E. Dudgeon D. Ng P.T. Cannicci S. Yau C.S.T. Hui J.H.L. Chu K.H. Lau S.C.K. Sadovy Y.J. Chan K.K.Y. Brander L. Wong C.K. Cheang C.C. Baker D.M.	4,233,490
9	Study of Biodiversity and Ecology of the Marine Environment Adjacent to Castle Peak and Black Point Power Stations 青山及龍鼓灘發電廠附近海洋環境的生物多樣性與生態研究	CLP Power Hong Kong Limited 中華電力有限公司	**Leung, K.M.Y.** Lai,V.C.S.	1,818,830
Subtotal				HKD 16,719,660

＊項目名稱以英文譯本為準　　#Person with underline is SKLMP member

Grants from Hong Kong 香港科研資助

University Grants Committee　大學教育資助委員會

	Project Title * 項目名稱	Grant Type 資助類型	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
		2017		
1	Ecological Risk Assessment of Retinoic Acids in Urbanized Coastal Marine Ecosystems 都市化沿海海洋生態系統中維甲酸的生態風險評估	General Research Fund 優配研究金	**Leung, K.M.Y.** Lee, J.S.	733,240
2	The South China Sea and Beyond: A Genome-wide Phylogeographical Study of Macrobenthos in the Chemosynthesis-based Ecosystems of the Subtropical to Temperate Northwestern Pacific Ocean 南中國海及以外：亞熱帶到溫帶西北太平洋化學合成的生態系統中的大型底棲動物全基因組系統地理學研究	General Research Fund 優配研究金	**Qiu, J.W.** Gan, J.P. Watanabe, H.	522,898
3	Study of Waterborne Contaminants in Hong Kong Coral Communities 香港珊瑚群落中新興水體污染物的研究	Environment and Conservation Fund 環境及自然保育基金	**Lam, J.C.W.** Ang, P.O.	498,000
4	Diagnosis and Prognosis of Intensifying Eutrophication, Hypoxia and the Ecosystem Consequences around Hong Kong Waters: Coupled Physical-biogeochemical-pollution Studies 香港及鄰近海域富營養化，缺氧及生態後果的診斷和預測：物理 - 生物地球化學 - 污染耦合研究	Theme-based Research Scheme 主題研究計劃	**Gan, J.P.** Lam, P.K.S. Dai, M.H. Liu, H.B. Baker, D. Chan, L.L. Chen, J. Ang, P.O. Wai, O.W.H. Zhu, J.A. Lau, S.C.K. Chen, S.N.	40,000,000
5	Regulatory Roles of Toxicity-responsive MicroRNAs in Osmoregulatory Functions of the Gills of Japanese Eels 滲透壓誘導的小型非編碼核糖核酸在日本鰻魚鰓滲透功能的調節作用	General Research Fund 優配研究金	**Wong, C.K.C.** Lai, B.K.P.	830,000
6	Impact of Prenatal Exposure to Perfluorooctane Sulfonate (PFOS) on Male Reproductive Health 產前全氟辛烷磺酸 (PFOS) 暴露對雄性子代生殖功能的影響	NSFC/RGC Joint Research Scheme 國家自然科學基金 / 研究資助局聯合研究計劃	**Wong, C.K.C.**	570,000
7	Enhanced Sedimentation and Hydrolysis of Solid Organics for Biological denitrification in Wastewater Treatment 有機固體污染物的強化沉澱及水解用於污水處理中的生物脫氮	General Research Fund 優配研究金	**Li, X.Y.**	675,647
8	Development of an Integrated Microfluidic-based System for Single Cell Mutation Analysis and Drug Sensitivity Test of Circulating Tumor Cells/Cell Clusters 開發集成化微流控系統用於單細胞水準迴圈腫瘤細胞 / 細胞團突變檢測和藥物敏感性分析	General Research Fund 優配研究金	**Yang, M.M.S.** Au, S.K. Yip, T.T.C. Zheng, Z.L.	540,824
9	Numerical Modeling Study of South China Sea Circulation Response to the Inflow/Outflow Forcing from Adjacent Seas 數值模擬研究中國南海海洋環流對鄰近海域的動力響應	General Research Fund 優配研究金	**Gan, J.P.**	675,647

＊項目名稱以英文譯本為準　　#Person with underline is SKLMP member

Grants from Hong Kong 香港科研資助

University Grants Committee　大學教育資助委員會

	Project Title ＊ 項目名稱	Grant Type 資助類型	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
	2017			
10	Microbial Food Web Dynamics in Hypoxic Coastal Waters: Effects of Hypoxia on Biodiversity, Ecological function and Physiological Condition of Protistan Grazers 近海缺氧水體對原生動物多樣性及其生理狀況和生態功能的影響	General Research Fund 優配研究金	**Liu, H.B.**	877,946
11	Environmental Assessment of Chiral Pharmaceuticals in Hong Kong and its Surrounding Region: Occurrence, Fate and Potential Toxicological Significance 手性藥物在香港及其周邊地區的環境評估：分佈，歸趨和潛在毒性的研究	General Research Fund 優配研究金	**Lam, P.K.S.** Lam, J.C.W.	540,824
12	Microbial Food Web Dynamics in Hypoxic Coastal Waters: Effects of Hypoxia on Biodiversity, Ecological function and Physiological Condition of Protistan Grazers 近海缺氧水體對原生動物多樣性及其生理狀況和生態功能的影響	General Research Fund 優配研究金	**Liu, H.B.**	877,946
13	Mechanistic Studies of Photo-triggered Traceless Staudinger-Bertozzi Ligation Reaction 光觸發的無痕施陶丁格連接反應的機理研究	General Research Fund 優配研究金	**Lam, M.H.W.**	370,000
	Subtotal			HKD 47,712,972

International Grants 國際科研資助

Research Grant　科研項目

	Project Title ＊ 項目名稱	Grant Type 資助類型	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
	2017			
1	Effects of Drugs and Contaminants in Marine Environments in Norway 藥物和污染物於挪威海洋環境中之影響	Norwegian Ministry of Trade, Industry and Fisheries	**Samuelsen, O.** Fang, J.K.H.	19,007,800
	Subtotal			HKD 19,007,800

＊項目名稱以中文譯本為準　　#Person with underline is SKLMP member

Grants from Mainland China 內地科研資助

Research Grant　科研項目

	Project Title * 項目名稱	Grant Type 資助類型	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (CNY)
		2017		
1	Composition and Geographical Distribution Pattern of Species in Genus *Gambierdiscus* in Typical Habitats of the East-South China Seas, General Program 岡比甲藻在東海 - 南海典型棲息地的組成和地理分佈	NSFC 國家自然科學基金	**Lu, D.D.** Chan, L.L.	730,000
2	Nanotoxicology of Marine Environments 海洋環境中納米材料毒理學研究	Shenzhen Science and Technology Program 深圳科技計劃	**Wang, W.X.**	3,000,000
3	Coral Bleaching: Molecular Mechanisms and Early Warning Biomarkers 珊瑚白化分子機制及早期預警標誌物的研究	Shenzhen Science and Technology Innovation Commission 深圳市科技創新委員會	**Qiu, J.W.**	500,000
4	Study on the Ecological Threshold under the Urbanization 城市化條件下海灣的生態閾值	Science and Technology Innovation Commission of Shenzhen Municipality 深圳市科技計劃學科佈局項目	**Lam, P.K.S.** Chan, L.L. Wu, J.J. Mak, M.Y.L. Tsui, M.M.P.	2,000,000
5	Ciguatoxin Biosynthetic Mechanism of Marine Benthic Dinoflagellates, *Gambierdiscus* spp.; Emergency Management Program 海洋底棲岡比甲藻的西加毒素生物合成機制探究	NSFC 國家自然科學基金	**Chan, L.L.**	200,000
6	China Scientific Safety Diving Promotion Program, Emergency Management Program 國家自然科學基金應急管理項目	NSFC 國家自然科學基金	**Wu, J.J.** Chan, L.L.	180,000
	Subtotal			CNY 6,610,000

Awards, Recognitions and Patents 獎項、讚譽和專利

Awards 獎項

Member	Award Description	Country	Award Date	Awardee(s)
Dr. Doris W.T. AU	CSE Discovery and Innovation Gala Award	Hong Kong	Jun 2017	Doris W.T. AU, S.G. CHEUNG, Richard Y.C. KONG
	Best Oral Presentation & Student Travel Grant The 9th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 19)	Japan	30 Jun-3 Jul 2017	Jiezhang MO
Dr. Leo L. CHAN	Best Poster Award The 2017 International Marine Drugs Symposium	China	5-9 Nov 2017	Jiajun WU
Prof. S.H. CHENG	2017 UGC Teaching Award (General Faculty Members/Teams)	Hong Kong	7 Sep 2017	Gary FENG, S.H. CHENG, Ron KWOK, Linda LAI, Eva LUI
Dr. Apple P.Y. CHUI	Best Poster Award 2017 Croucher Advanced Study Institute- "Impacts of Eutrophication, Pollution and Harmful Benthic Microalgae Blooms on Coastal Coral Reef Ecosystems"	Hong Kong	4 Aug 2017	Apple P.Y. CHUI
Prof. Paul K.S. LAM	Best Poster Award The 9th National Conference on Environmental Chemistry	China	19-22 Oct 2017	Zhen WU
Prof. Kenneth M.Y. LEUNG	The Society of Toxicology and Chemistry (SETAC) Fellows Award 2017	USA	12 Nov 2017	Kenneth M.Y. LEUNG
	The 19th Biwako Prize for Ecology by the Ecological Society of Japan	Japan	27 Aug 2017	
	One of the Top 1% Cited Scientists in the Field of Ecology/Environmental Science	International	2017	
	Alumni Advocate Award - Bronze by Vocational Training Council	Hong Kong	2017	
	Outstanding Research Student Supervisor Award 2015-2016	Hong Kong	Mar 2017	
Prof. Nora F.Y. TAM	Honorary University Fellowship of The Open University of Hong Kong	Hong Kong	2017	Nora F.Y. TAM
	Honor Certificate for the Year 2016 Award on Science and Technology Program of Shenzhen, Committee of Science, Technology and Innovation, Shenzhen Government	China	2017	

Patents 專利

Member	Patent Name	Country	Date of Publication	Publication No.	Inventor(s)
Prof. Michael H.W. LAM	Chemosensing Hydrogel for the Detection of Biogenic Amines	US	3 Aug 2017	US 20170219549 A1	Michael H.W. LAM
	用於生物胺檢測的化學傳感水凝膠	China	11 Aug 2017	CN107037044A	Michael H.W. LAM
Prof. S.H. CHENG	Method of *in vivo* Screening for Cardiac Toxic Agents Using Teleost	US	3 Jan 2017	US 9535057 B2	S. H. CHENG P. K. CHAN

＊項目名稱以英文譯本為準　　#Person with underline is SKLMP member

Organization and Implementation of Individual Research Areas 自主研究課題情況與效果

Funding Support from CityU 城大內部撥款資助項目

SKLMP Postgraduate Scholarship (PGS)　SKLMP 研究生獎學金

In order to nurture young scientists and develop strategic and in-depth research in the field of marine pollution, the SKLMP has decided to provide financial support to our members to recruit excellent postgraduates

	Project Title * 項目名稱	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
	Nov 2017 – Oct 2019		
1	Generation of transgenic marine medaka lines to enable high-resolution reconstruction of the beating heart 構建轉基因海水青鳉用於重建高解析度跳動心臟	**Cheng, S.H. (CityU)** Wong, C.K.C. (HKBU) Yao, X. (CityU) Li, T. (TianjinU)	100,000

Director Discretionary Fund (DDF)　主任資助基金

The fund is allocated by the SKLMP Director to support exploratory projects for encouraging innovation and new initiatives

	Project Title * 項目名稱	Investigators # 項目負責人 (**PI or PC** / Co-PI or Co-I)	Amount 金額 (HKD)
	Nov 2017 – Oct 2018		
1	Biomarker diagnostics of metal pollution in Hong Kong's waters 香港水域金屬污染的生物標誌物診斷	**Wang, W.X. (HKUST)**	200,000
	Jun 2016 – Jun 2018		
2	Identification and assessment of emerging halogenated organic pollutants in marine ecosystem 海洋生態系統中新興鹵系有機污染物的識別與評估	**Lam, J.C.W. (EdUHK)**	400,000
	Jun 2016 – Dec 2017		
3	Functional responses of marine ecosystem to hypoxia 海洋生態系統對缺氧的功能性響應	**Wu, R.S.S. (EdUHK)** Tam, N.F.Y. (CityU) Shin, P.K.S. (CityU) Cheung, S.G. (CityU) Au, D.W.T. (CityU) Ang, P.O. (CUHK) Chiu, J.M.Y. (HKBU)	400,000

＊項目名稱以英文譯本為準　　#Person with underline is SKLMP member

Funding Support from the Innovation and Technology Commission
創新科技署國家重點實驗室專項基金資助項目

SKLMP Seed Collaborative Research Fund (SCRF) SKLMP 種子協作研究基金

The fund aims to promote excellent, collaborative and interdisciplinary research programs among members from the six collaborating universities

	ProjectTitle* 項目名稱	Investigators # 項目負責人 (**PI or PC /** Co-PI or Co-I)	Amount 金額 (HKD)
	Jan 2018 - Dec 2020		
1	Microplastics augment the transfer of Bisphenol A and Bisphenol A analogues to marine fish 微塑料增加雙酚 A 和雙酚 A 類似物的轉移到海洋魚類	**Lai, B.K.P. (CityU)** Cheung, S.G. (CityU) Wong, C.K.C. (HKBU)	240,000
	Nov 2017 - Oct 2020		
2	Ocean acidification threatens Chinese oysters: Can some species adapt within this century? 海洋酸化威脅到中國的生蠔：本世紀內有物種能適應嗎？	**Thiyagarajan, V. (HKU)** Qiu, J.W. (HKBU) Qian, P.Y. (HKUST) Cheung, S.G. (CityU) Dai, M.H. (XMU)	240,000
3	How phosphate concentration affect the nitrogen uptake of phytoplankton? 磷酸鹽濃度影響浮游植物的氮吸收的機理研究	**Liu, H.B. (HKUST)** Chan, L.L. (CityU)	240,000
4	Neurotoxicity studies of selected marine biotoxins via neurometabolomic profiling and neurobehavioral assessment on marine medaka (*Oryzais melastigma*) and zebrafish (*Danio rerio*) 利用青鱂及斑馬魚作為腦神經代謝分析和神經行為評估平台進行對幾種海洋生物毒素的神經毒性的研究	**Lam, M.H.W. (CityU)** Lam, J.C.W. (EdUHK)	240,000
5	Targeting Astrocytes-neuronal L-lactate signaling pathway for rescuing decision-making deficit in chronic ciguatera poisoning 靶向星形膠質 - 神經元 L - 型乳酸信號通路治療慢性雪卡中毒相關的決策行為障礙	**Li, Y. (CityU)** Chan, L.L. (CityU)	240,000
	Apr 2014 - Mar 2017		
6	Transgenerational effects of hypoxia in fish and underlying mechanisms 缺氧對魚類的跨代影響及其內在機制	**Kong, R.Y.C. (CityU)** Wong, C.K.C. (HKBU) Chiu, J.M.Y. (HKBU) Au, D.W.T. (CityU) Wu, R.S.S. (EdUHK)	220,000
7	Development of electrochemical sensing platform based on AuNPs modified TiO_2 nanotubes for emerging chemicals of concern and pharmaceutical residues detection 開發基於金納米粒子修飾的二氧化鈦納米管的電化學傳感平台用於環境污染的檢測	**Yang, M.M.S. (CityU)** Wu, R.S.S. (EdUHK) Lam, P.K.S. (CityU) Lam, M.H.W. (CityU) Chan, L.L. (CityU)	900,000
8	Investigation of coupled circulation and ecosystem process in Mirs Bay-Tolo Harbour (Hong Kong) during summer time 香港大鵬灣 - 吐露港夏天海流 - 生態耦合系統過程的研究	**Gan, J.P. (HKUST)** Lam, P.K.S. (CityU) Chan, L.L. (CityU) Liu, H.B. ((HKUST) Chan, R.K.Y. (HKBU) Ang, P.O. (CUHK)	1,500,000

Summary of the Postgraduate Scholarship (PGS) Projects
PGS 項目概要

Nov 2017 – Oct 2019 (On going)

Generation of transgenic marine medaka lines to enable high-resolution reconstruction of the beating heart
構建轉基因海水青鱂用於重建高解析度跳動心臟

S.H. CHENG, Chris K.C. WONG, X. YAO

Funding Amount: HK$100,000

The marine medaka is a model organism used widely in the investigation of the cellular and molecular mechanism of marine pollution in the SKLMP and other laboratories in the world. In a recently awarded CRF, we have proposed successfully to use this fish to study the cardiotoxicity of benthic and epiphytic toxic algae (BETA). However, one of the obstacles in using marine medaka fish to studying cardiotoxicity is the current lack of suitable transgenic lines which have reporters of the cardiomyocytes. Consequently, our current understanding of how marine pollutants affect early vertebrate cardiac development is based on fixed-tissue data obtained by histological sections and EM imaging. Specific cell types. genes and proteins of interests can be localized by biomarkers and reporters following laborious in situ hybridization and immunohistochemistry studies on sectioned histology slides. The shaped of a fixed embryonic or adult heart is often distorted and there is currently not possible to link high resolution anatomical structures with physiological functions in a live embryonic nor adult fish. In other words, the study on the cardiotoxicity effects of marine pollutants should ideally be performed on living organs in intact organisms, so that biomechanical forces and cardiac physiology can be studied and aligned with cardiac morphogenesis and functions. To address this gap in the knowledge, we propose to generate a series of transgenic lines of marine medaka. These transgenic medaka lines can support noninvasive imaging of fluorescently labelled cardiac tissues in the live embryos and larvae for in toto long term (up to 48 hours) of imaging. This project builds on our previous success in generating transgenic medaka lines and fabrication of macrofludicis chambers to facilitate the measurements of heart beats and behavior in larval fish. This project will impact upon future studies by improving the efficiencies of establishing transgenic marine medaka lines and the optimized protocols for investigating how these transgenic larval fish behave and react in the presence of marine pollutants in microfluidics chambers. These resources and methodologies can be adopted by other teams in the SKLMP with ease. This proposed PRg work is part of a IRF proposal submitted in parallel.

Summary of the Director Discretionary Fund (DDF) Projects
DDF 項目概要

Nov 2017 – Oct 2018 (On going)

Biomarker diagnostics of metal pollution in Hong Kong's waters
香港水域金屬污染的生物標誌物診斷

W.X. WANG

Funding Amount: HK$200,000

Traditional monitoring of metal pollution in Hong Kong's coastal environments has mainly focused on the coastal sediments, water and marine organisms. There is limited knowledge regarding the potential responses of local marine organisms to metal pollution in a field environmental setting. It will be important to develop early diagnostic tools to predict the potential impacts of metal pollution. A bioindicator study using different biomarker systems in Hong Kong is therefore clearly needed. The purposes of this project are to provide monitoring of pollution in Hong Kong's waters using both water and biomonitor analysis and more importantly to assess the potential influences of anthropogenic activity on local marine organisms using a biomarker approach.

Jun 2016 – Jun 2018 (On going)

Identification and assessment of emerging halogenated organic pollutants in marine ecosystem

海洋生態系統中新興鹵系有機污染物的識別與評估

James C.W. LAM

Funding Amount: HK$400,000

Coastal environment of China has been undergoing strong modifications due to rapid economic growth and industrialization. These may increase the demand for flame retardants used in the manufacture of products for both domestic use and export, so it is not surprising that huge amounts of halogenated flame retardants (HFRs) are found in this region. Among the HFRs, polybrominated diphenyl ethers (PBDEs) has become one of the most concerned environmental contaminants because of their persistence, bioaccumulative tendencies and potential adverse effects on organisms, as well as their large scale of use. Consequently, this has resulted in strict bans of Penta- and Octa-BDE formulations. The phase-out of PBDEs is expected to reduce the world market demand for these compounds, but other HFRs may consequently take their place in product manufacturing. Previous monitoring studies on sediment and biological samples revealed the widespread occurrence of conventional HFR including PBDEs and hexabromocyclododecanes (HBCDs) in the Chinese coastal region. Recently, a number of emerging HFRs are detected in the environment and the presence of several of these new chemicals in biota indicates that they are bioavailable and can be absorbed and bioaccumulated. However, the information regarding the environmental occurrence, distribution and fate of these chemicals is still scanty. An increasing number of studies indicated that several novel HFRs such as Dechlorane Plus (DP) are of particular concern in China and elsewhere. Our recent studies has shown the relatively high levels of bis-(2-ethylhexyl)-tetrabromophthalate (TBPH) and 2-ethylhexyl 2,3,4,5-tetrabromobenzoate (TBB), in blubber samples of Indo-Pacific humpback dolphins (Sousa chinensis) and finless porpoises (Neophocaena phocaenoides) and indicated the presence of a potential source of these new brominated flame retardants in Pearl River Delta region. This has led to the suspicion that similar types of new HFRs may be extensively used in the estuarine areas, and raises our attention on the status of these new chemicals in other Chinese estuaries. Pearl River Delta (PRD) in south China and Yangtzu River Delta (YRD) in central China are the two important estuarine systems. With the rapid industrialization and urbanization, this may, as a result, increase the stresses on the environment and ecosystem of these places and assessment of novel HFRs in these places is strongly needed. To assess a variety of emerging HFRs in different environmental matrices, an ultra-performance liquid chromatography coupled with atmospheric pressure chemical ionization tandem mass spectrometry was developed for simultaneous quantification of PBDEs, HBCDs, and other new HFRs. Information regarding the environmental occurrence of novel HFRs is still limited. This study, therefore, proposes to provide information on concentration, distribution and accumulation of novel HFRs in different environment matrices including sediment and biological samples. These results would also help prioritize which HFRs merit study, and will assist in modelling their environmental fate and transport.

Research Output

Papers with the SKLMP included as the first affiliation 以 SKLMP 為第一單位的期刊論文

1 Lam, J.C.W., Lyu, J., Kwok, K.Y., Lam, P.K.S. (2016)
Perfluoroalkyl substances (PFASs) in marine mammals from the south China sea and their temporal changes 2002-2014: Concern for alternatives of PFOS?
Environmental Science & Technology, 50(13):6728-6736.

2 Zeng, L., Lam, J.C.W., Horii, Y., Li, X., Chen, W., Qiu, J.W., Leung, K.M.Y., Yamazaki, E., Yamashita, N., Lam, P. K.S.(2017).
Spatial and temporal trends of short-and medium-chain chlorinated paraffins in sediments off the urbanized coastal zones in China and Japan: A comparison study.
Environmental Pollution, 224, 357-367.

3 Wu, Q., Lam, J.C.W., Kwok, K.Y., Tsui, M.M.P., Lam, P. K. S.(2017).
Occurrence and fate of endogenous steroid hormones, alkylphenol ethoxylates, bisphenol A and phthalates in municipal sewage treatment systems.
Journal of Environmental Sciences, 61, 49-58.

4 Chen, L., Lam, J.C.W. (2017).
SeaNine 211 as antifouling biocide: A coastal pollutant of emerging concern.
Journal of Environmental Sciences, 61, 68-79.

5 Tsui, M.M.P., Lam, J.C.W., Ng, T.Y., Ang, P. O., Murphy, M. B., Lam, P.K.S. (2017).
Occurrence, distribution, and fate of organic UV filters in coral communities.
Environmental Science & Technology, 51(8), 4182-4190.

Papers with the SKLMP as one of the affiliations 以 SKLMP 為作者單位之一的期刊論文

1 Man, Y.B., Chow, K.L., Man, M., Lam, J.C.W., Lau, F.T., Fung, W.C., Wong, M.H. (2015)
Profiles and removal efficiency of polybrominated diphenyl ethers by two different types of sewage treatment work in Hong Kong.
Science of the Total Environment, 505:261-268.

2 Liu, H. Q., Lam, J.C.W., Li, W.W., Yu, H. Q., Lam, P.K.S. (2017)
Spatial distribution and removal performance of pharmaceuticals in municipal wastewater treatment plants in China.
Science of The Total Environment, 586, 1162-1169.

3 Chen, L., Wang, X., Zhang, X., Lam, P.K.S., Guo, Y., Lam, J.C.W., Zhou, B. (2017)
Transgenerational endocrine disruption and neurotoxicity in zebrafish larvae after parental exposure to binary mixtures of decabromodiphenyl ether (BDE-209) and lead.
Environmental Pollution, 230, 96-106.

4 Zeng, L., Lam, J.C.W., Chen, H., Du, B., Leung, K.M.Y., Lam, P. K.S. (2017)
Tracking dietary sources of short-and medium-chain chlorinated paraffins in marine mammals through a subtropical marine food web.
Environmental Science & Technology, 51(17), 9543-9552.

5 Zhu, B., Lam, J.C.W., Lam, P. K.S. (2017)
Halogenated flame retardants (HFRs) in surface sediment from the Pearl River Delta region and Mirs Bay, South China.
Marine Pollution Bulletin, In Press

Jun 2016 – Dec 2017 (On going)

Functional responses of marine ecosystem to hypoxia
海洋生態系統對缺氧的功能性響應

Rudolf S.S. WU, Nora F.Y. TAM, Paul K.S. SHIN, S.G. CHEUNG, Doris W.T. AU, Put O. ANG, Jill M.Y. CHIU

Funding Amount: HK$400,000

Both laboratory microcosm studies and field transplantation experiments were carried out to test the hypothesis that hypoxia will affect essential ecosystem services through altering:

(a) microbial composition in the marine benthic environment,
(b) important ecological functions of marine benthic microbial communities (i.e. nutrient recycling, decomposition and aerobic/anaerobic activities),
(c) functional groups of marine benthic meiobenthos, and
(d) the marine benthic community

We further tested the resilience of these ecosystem functions to examine whether the observed changes are short-term or long-term.

We have successfully completed all the necessary studies and fully addressed the original project objective. We have also completed most of the data analyses. Overall, our study demonstrated, for the first time, that essential ecosystem functions (including primary productivity, redox reactions, C-cycling, N-cycling, P-cycling and S-cycling) are impaired by hypoxia. These important functional changes are associated with significant changes in species composition and functional groups of bacterial and protistan communities, as well as functional groups of the meiofaunal communities. Under normoxia, the dominant functional group of nematodes were epigrowth feeder, non-selective deposit feeder, close to opportunists and opportunists, and these changed into selective deposit feeder, epigrowth feeder and medium opportunists in the hypoxic environment. Results of our microcosm experiments further showed that hypoxia can also cause significant changes in the biological traits of macrobenthos, encouraging the dominance of carnivores and omnivores and a reduction of sub-surface deposit feeders.

Summary of the Seed Collaborative Research Fund (SCRF) Projects
SCRF 項目概要

Nov 2017 – Oct 2020 (On going)

Microplastics augment the transfer of Bisphenol A and Bisphenol A analogues to marine fish
微塑料增加雙酚 A 和雙酚 A 類似物的轉移到海洋魚類

Ball K.P. LAI, S.G. CHEUNG, Chris K.C. WONG

Funding Amount: HK$240,000

Plastic debris makes up near 80% of marine litter in Hong Kong. The plastics are broken down into microplastics (< 5mm) under ultraviolet (UV) light at relatively low temperatures. The high surface to volume ratio, porosity as well as binding coefficients to organic pollutants of microplastics enable them to concentrate different persistent organic pollutants (POPs) in the aqueous phase, and pass onto a wide range of marine organisms such as bivalves, mussels and fishes. Indeed, microplastics have been suggested as the major carriers for the transfer of POPs to marine organisms and human. In our preliminary study, microplastics were found in sand samples in Hong Kong waters. Moreover, our recent report has demonstrated the presence of BPA and BPA analogues (BPS, BPF, BPB) in the marine fish purchased from Hong Kong markets. We hypothesize that microplastic particles could adsorb/absorb and concentrate BPA and BPA analogues in water and transfer these pollutants to marine fishes via ingestion. In this proposal, we aim to **1) quantify the levels of Bisphenol A (BPA) and BPA analogues (BPS, BPF, BPB) in microplastics; and 2) measure the amount of microplastics in the digestive system of marine fishes, collected in HK coastal waters. Using marine medaka *Oryzias melastigma* as a fish model, laboratory experiments will be carried out to: 3) investigate bioaccumulation of BPA and BPA analogues in microplastics-fed fish; and 4) determine the toxicological effects from ingestion of BPA and BPA analogues contaminated microplastics.** The successful of this study will develop a model for studying the POPs-sorbed microplastics and provide a rapid tool for detecting and monitoring the risks of microplastics on fish and human health.

Nov 2017 – Oct 2020 (On going)

Ocean acidification threatens Chinese oysters: Can some species adapt within this century?

海洋酸化威脅到中國的生蠔：本世紀內有物種能適應嗎？

V.THIYAGARAJAN, J.W. QIU, P.Y. QIAN, S.G. CHEUNG, M.H. DAI

Funding Amount: HK$240,000

Edible oysters are ecosystem engineers, nutritious delicacy, and an integral part of the local heritage. However, rising carbon-dioxide in coastal oceans due to anthropogenic emissions is threatening their survival through the process of ocean acidification (OA). China is seriously concerned about this emerging threat because it is a center of oyster biodiversity, >80% of world's oyster are produced here and their coastal waters are vulnerable to OA. To date, several short-term, single species and single-life stage acclimation experiments have identified that calcification, metamorphosis and growth of several oyster species will be negatively affected by OA and they will become losers in near-future. Despite these worrying forecast, the lack of long-term acclimation experiments involving multiple-life stages and multiple-generations, lack of knowledge on adaptive potential, and lack of mechanistic models to predict which species will survive in the phase of OA, hampers a thorough forecast of oyster resilience to OA not only in China but globally. Oysters inhabiting the coastline of China, hereafter called as "Chinese oysters", can serve as model to estimate the adaptive potential of oysters to OA and multiple stressors. The availability of complete genome, database of transcriptome and phylogenetic database for these oyster species are an added advantage.

Series of our previous studies indicates that oyster response to OA is dependent on species, population and life-history stages. Indeed, individuals within a population also differentially respond to OA. The OA-tolerant individuals within a population or species are expected to have a high level of plasticity for several OA-sensitive traits. If these OA-sensitive trait is heritable within few generations and the associated physiological trade-offs are not constrained by negative correlations with other fitness traits, adaptation is possible for Chinese species to tolerate OA within this century. We are hypothesizing that high amounts of heritable genetic variation for OA-sensitive traits exists in oyster species or populations inhabiting in a highly fluctuating estuarine environments than their counterparts inhabiting in a relatively stable environment. For example, the Suminoe oyster that is able to survive in variable pH conditions and large geographical/environmental ranges including variety of anthropogenic pollution stressors, is expected to have a potential to adapt to future conditions under OA than other species. The outcome of this project will not only provide information for formulating policies for the protection of oyster species diversity but will also serve as role model for studying adaptive potential of various marine organisms to OA.

Remarks from applicant: This funding will be primarily used to generate data for the future RGC Collaborative Research Proposal - Indeed, we have already formed the team involving several SKLMP members (we have submitted the preliminary proposal during last round but was not successful and next time we generate preliminary data and try again)

Nov 2017 – Oct 2020 (On going)

How phosphate concentration affect the nitrogen uptake of phytoplankton?

磷酸鹽濃度影響浮游植物的氮吸收的機理研究

H.B. LIU, Leo L. CHAN

Funding Amount: HK$240,000

Anthropogenic activities are altering total nutrient loads to many estuaries and coastal waters, resulting in high loads of total inorganic and organic nutrients, as well as the species composition of different nutrients, e.g., the ratio of oxidized and reduced forms of nitrogen (NO_3- vs NH_4+) and the ratio of inorganic nitrogen to phosphorus (N:P). While more is known about the taxon-specific differences in NH_4+ and NO_3- metabolism and their contribution to changes in phytoplankton community composition when the composition of the N pool changes, the effect of other essential nutrients, particularly P, on the assimilation of different species of nitrogen has not been studied. In this proposed study, we will conduct laboratory and field experiments to test our hypothesis that P-limitation hampers phytoplankton nitrogen uptake, and that such effect varies among different nitrogen sources and different phytoplankton species. We will also investigate whether the effect of P concentration on the nitrogen metabolism of phytoplankton at species and community levels are also influenced by environmental factors, such as light and temperature. These relationships have important implications for harmful algal blooms, development of nutrient criteria for management, and modeling of nutrient uptake by phytoplankton, particularly in conditions where eutrophication is increasing and the redox state of N loads is changing.

Dec 2017 – Nov 2020 (On going)

Neurotoxicity studies of selected marine biotoxins via neurometabolomic profiling and neurobehavioral assessment on marine medaka (*Oryzais melastigma*) and zebrafish (*Danio rerio*)

利用青鱗魚及斑馬魚作為腦神經代謝分析和神經行為評估平台進行對幾種海洋生物毒素的神經毒性的研究

Michael H.W. LAM, James C.W. LAM

Funding Amount: HK$240,000

Environmental neurotoxicology is the study of neurological impacts of natural and synthetic chemical agents on biological entities, especially human, with the ultimate objective of protecting public health. While the traditional way of assessing neurotoxicity of environmental stresses is by observing the behaviors of laboratory animals dosed with various levels of the stresses, the use of human and animal neural cell lines to study how these stresses affect cellular activities and vitality is becoming more and more popular. However, correlating cell-based neurotoxicity end-points with observable behavioral effects on animal models is usually complicated by the lack of systemic biological processes and inter-cellular and –tissue networking in cellular studies. The manifestation of neurotoxicological effects by environmental stresses on a biological entity may be accompanied by the perturbation of the normal expression profile of neurotransmitters in its central nervous system (CNS). Our research team has already demonstrated such neurometabolic perturbation by the polybromodiphenyl ether congener, BDE-47, and brevetoxins (PbTx-1 & PbTx-2) on marine medaka (*Oryzais melastigma*). In this project, we will further develop this targeted neurometabolomic technique to evaluate neurotoxicological effects of selected marine biotoxins, such as saxitoxins and ciguatoxins, that may contaminate seafood and, therefore, affect public health. Besides marine medaka, we will also develop zebrafish (*Danio rerio*) as a platform for neurometabolomics studies. We will also assess neurobehavioral responses of these model organisms in order to correlate the revealed neurometabolic impacts by the biotoxins with phenotypical / behavioral outcomes. Our studies should enable the identification of neurotransmitter markers for the fast screening of biotoxin exposure, and the better understanding of the neurotoxicity mechanisms of those marine biotoxins.

Nov 2017 – Oct 2020 (On going)

Targeting astrocytes-neuronal L-lactate signaling pathway for rescuing decision-making deficit in chronic ciguatera poisoning

靶向星形膠質 - 神經元 L 型乳酸信號通路治療慢性雪卡中毒相關的決策行為障礙

Y. LI, Leo L. CHAN

Funding Amount: HK$240,000

Ciguatera poisoning is the most frequently reported seafood-toxin illness that manifests in complex and long-lived neurological symptoms which are more severe in repeated exposure. However, very few studies have been conducted in animal models to investigate the nature of central nervous system damage and the underlying mechanisms for behavioral deficits after exposure to ciguatoxin. Previously, we showed a single dose of Pacific ciguatoxin-1 (P-CTX-1) induced severe visceral pain, and anterior cingulate cortex (ACC) synaptic plasticity. Reactive astrogliosis was identified supporting the concept that neuron and astroglia signals may play roles in ciguatera poisoning. However, the induction of LTP was occluded in acute P-CTX-1 rats suggesting emotional and cognitive dysfunctions in ciguatera poisoning. By examining a rat model with chronic repeated exposure to sub-clinic dosage of P-CTX-1, we observed development of anxiety and decision making deficits in rats after one-month exposure to the toxins. Nonetheless, the underlying molecular mechanisms are poorly understood.

The brain requires continuous supply of oxygen and energy-yielding substrates involving glucose. A growing body of evidence suggests that L-lactate, byproduct of astrocytic glycolysis, plays a critical role in cognition processing. Astrocytes respond to all forms of CNS damage and disease by undergoing cellular, molecular and functional changes. Our preliminary data showed markedly reactive astrogliosis occurs in ACC in chronic P-CTX-1 rats. We hypothesized that impaired L-lactate release casually involved in cognitive deficit in chronic ciguatera poisoning. We find failure of L-lactate release in an activity-dependent manner in chronic ciguatera poisoning. Theta burst stimulation (TBS) which used to elicit LTP can reliably induce increase in lactate concentration in control rats, but not in P-CTX-1 rats. Further, P-CTX-1 rats exhibited significant lower lactate level immediately after the cognitive behavioral task (rat gambling task RGT). Next, exogenous L-lactate infusion into ACC repairs the impairments of LTP and decision-making performance in P-CTX-1 rats.

Using multi-electrodes recording in both BLA and ACC of freely behaving rats, spike-field coherence (SFC) analysis revealed chronic ciguatera poisoning led to disruption of ACC spike timing to BLA local theta oscillation. Cross-correlation analysis revealed that ciguatera poisoning was associated with suppressed synchronization between the BLA and ACC, indicating reduced neuronal communications between these two regions under chronic ciguatera poisoning.

Disruption of the flow of L-lactate from astrocytes to neurons severely impairs the local and broad spatial scales of interaction of ACC neuronal network, disturbs functionally coherent assemblies and damages the decision making ability in chronic ciguatera poisoning.

Apr 2014 – Mar 2017 (Completed)

Transgenerational effects of hypoxia in fish and underlying mechanisms
缺氧對魚類的跨代影響及其內在機制

Richard Y.C. KONG, Chris K.C. WONG, Jill M.Y. CHIU, Doris W.T. AU, Rudolf S.S. WU

Funding Amount: HK$2,200,000

Globally, hypoxia is one of the most widespread and pressing problem in aquatic environments. More than 400 "Dead Zones" have been identified by the United Nations around the world, including two out of the three major estuaries in China (the Pearl River and Yangtze River estuaries). Extensive studies have shown that hypoxia causes major changes in community structure as well as declines in species diversity and fishery production over large areas. These changes have led to severe economic and habitat losses, both in Hong Kong and worldwide. Our earlier studies revealed, for the first time, that hypoxia is an endocrine disruptor as well as a teratogen, causing reproductive dysfunction, deformities and a male-biased FI generation in fish. In mammals, recent studies have revealed that some endocrine-disrupting chemicals (EDCs) can cause adverse effects in offspring (including decreased reproductive capacity, defornities and infertility) through epigenetic alterations (including DNA methylation, histone modification and microRNA regulation) without any change in the DNA sequence, despite the offspring never being exposed to EDCs. A recent mammalian study further provided evidence that the exposure of parents to hypoxia can result in sexual retardation, mortality, abnormal development and behavioural changes in the second generation. Whether hypoxia alters epigenetic regulation and causes adverse transgenerational effects in fish remains unknown. Also, whether or not the altered epigenome may be restored to the original state, and how long this takes remain unknown. This novel proposal aims to provide answers to these two important questions. Clearly, the risk posed by hypoxia on the sustainability of natural populations might have been grossly underestimated should transgenerational effects occur and persist.

Research Output

Papers with the SKLMP as one of the affiliations 以 SKLMP 為作者單位之一的期刊論文

1 Lai, B.K.P., Li, J.W., Wang, S.Y., Chiu, J.M.Y., Tse, A., Lau, K., Lok, S., Au, D.W.T., Tse, W.K., Wong, C.K.C., Chan, T.F., Kong, R.Y.C., Wu, R.S.S. (2015)
Tissue-specific transcriptome assemblies of the marine medaka Oryzias melastigma and comparative analysis with the freshwater medaka *Oryzias latipes*.
BMC Genomics, 16:135.

2 Lai, B.K.P., Li, J.W., Tse, A.C.K., Cheung, A., Wang, S., Chan, T.F., Kong, R.Y.C., Wu, R.S.S. (2016)
Transcriptomic responses of marine medaka's ovary to hypoxia.
Aquatic Toxicology, 177:476-483.

3 Li, J.W., Lin, X., Tse, A., Cheung, A., Chan, T.F., Kong, R.Y.C., Lai, B.K.P., Wu, R.S.S. (2016)
Discovery and functional characterization of novel mirnas in the marine medaka *Oryzias melastigma*.
Aquatic Toxicology, 175:106-116.

4 Wang, S.Y., Lau, K., Lai, B.K.P., Zhang, J.W., Tse, A.C., Li, J.W., Tong, Y., Chan, T.F., Wong, C.K.C., Chiu, J.M.Y., Au, D.W.T., Wong, A.S., Kong, R.Y.C., Wu, R.S.S. (2016)
Hypoxia causes transgenerational impairments in reproduction of fish.
Nature Communications, 7:12114.

Apr 2014 – Mar 2017 (Completed)

Development of electrochemical sensing platform based on AuNPs modified TiO_2 nanotubes for detection of emerging chemicals of concern and pharmaceutical residues

開發基於金納米粒子修飾的二氧化鈦納米管的電化學傳感平台用於環境污染物的檢測

Michael M.S. YANG, Rudolf S.S. WU, Paul K.S. LAM, Michael H.W. LAM, Leo L. CHAN

Funding Amount: HK$900,000

The current methods for the determination of environment pollution involve time-consuming detection processes and complex pre-treatment steps, which are not suitable for in-situ monitoring of samples and rapid processing of multiple samples.

Electrochemical sensors are expected to play an increasing role in environmental monitoring. Significant technological advances facilitate the environmental applications of electrochemical devices. They are inherently sensitive and selective towards electroactive species, fast and accurate, compact, portable and inexpensive. However, many current used electrodes are prone to surface fouling and passivation by radical intermediates or polymerization products generated by the electrochemical reactions between the analytes and electrode surface, which can lead to significant signal attenuation as well as reduced sensitivity and selectivity over time.

Recently, a refreshable electrode composed of AuNPs modified carbon-doped TiO_2 nanotube arrays (C-doped TiO_2-NTAs) was proposed and fabricated in our lab by quick annealing of the as-anodized TiO_2-NTAs in argon and electrodeposition. The electrode not only has excellent electrochemical activity, but also can be easily photocatalytically refreshed to maintain the high selectivity and sensitivity because they combine the merits of high electrocatalytic properties of AuNPs and photochemical properties of C-doped TiO_2-NTAs.

By taking these advantages, we plan to develop high-sensitivity and recyclable electrochemical sensing platforms for environment pollutants monitoring, e.g. emerging chemicals of concern (ECCs) (Alkylphenol, phenol, bis-phenol A, Benzo(a)pyrene, etc.), pharmaceutical residues (PRs) (sulfonamides, erythromycin, azithromycin, etc.) and microcystin. The outstanding and promising electrochemical analysis may have immense potential in high-sensitivity and high-selectivity sensor devices for environmental pollutants monitoring.

Research Output

Papers with the SKLMP as one of the affiliations 以 SKLMP 為作者單位之一的期刊論文

1 Hu, L., Fong, C.C., Zhang, X., Chan, L.L., Lam, P.K.S., Chu, P.K., Wong, K.Y., Yang, M.M.S. (2016) **Au nanoparticles decorated TiO_2 nanotube arrays as a recyclable sensor for photoenhanced electrochemical detection of bisphenol A.** *Environmental Science & Technology,* 50(8):4430-4438.

Apr 2014 – Mar 2018 (On going)

Investigation of coupled circulation and ecosystem process in Mirs Bay-Tolo Harbour (Hong Kong) during summer time
香港大鵬灣 - 吐露港夏天海流 - 生態耦合系統過程的研究

J.P. GAN, Paul K.S. LAM, Leo L. CHAN, H.B. LIU, Robert K.Y. CHAN, Put O. ANG

Funding Amount: HK$1,500,000

In 1998, Hong Kong suffered a devastating red tide attack that resulted in the worst loss of fish culture zone and damage of marine environment. The red tide was neither originated from the nutrient rich but likely light-limited Pearl River waters in the western part of Hong Kong waters, nor from offshore surface waters. The origin of the red tide was from Mirs Bay, which is located in the eastern part of Hong Kong Island and occupies about 50% of total sea area of Hong Kong. More than 10 year after the episode, the source of available nutrient that formed the red tide remains unclear. Lack of understanding about the role of the eastern part of Hong Kong waters has hindered us from obtaining holistic understanding on marine environment of the entire Hong Kong as well as solving the 1998 puzzle. With a deep central channel, unique shelf and coastline topography in the adjacent coastal waters, Mirs Bay is closely linked with the intrusions of nutrient rich deep waters from adjacent shelf, as a result of amplified cross-isobath shoreward transport at the lee of Hong Kong Island during southwesterly monsoon and from the Tolo Harbor to the north. Based on evidences derived from HKW and from the other parts of the world's oceans, it is hypothesized that: (H1) circulation and biogeochemical substance transports are largely controlled by the shelf-bay circulation associated with wind and tidally forced hydrodynamic response to the unique topography in Mirs Bay and (H2) the nutrient enrichments from adjacent shelf and from the inland harbor lead to an enhanced biological production in the bay. Study of this coupled harbor-bay-shelf circulation is crucial to scientifically understand the interactive dynamics in a harbor-bay-shelf system, and to complete the picture for the oceanic circulation and associated biogeochemical condition in Hong Kong waters. We propose to conduct field measurements, laboratory analysis and coupled physical-ecosystem numerical modeling to investigate hypotheses H1 and H2. Ultimate goal of the project is to identify the process and mechanism that the eastern part of Hong Kong waters play on the water ecosystem in the entire Hong Kong waters.

Governance Structure and Nurturing of Talents
隊伍建設與人才培養

Team Building and Management 團隊建設與管理

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Co-opted Members in 2017
2017 年增選成員

Dr Apple Pui Yee CHUI 崔佩怡博士

Dr Apple P.Y. Chui is a lecturer in the School of Life Sciences at the Chinese University of Hong Kong (CUHK). She obtained her B.Sc. degree in Biology from the Hong Kong University of Science and Technology, and MPhil and PhD degrees in Environmental Science and Biology from the CUHK. Since 2008, Dr Chui has been studying corals in Hong Kong. Her research interests include reproductive and larval ecology of corals, coral recruitment dynamics and restoration of corals using coral sexual reproduction. She has authored/ co-authored 11 scientific publications, and has given more than 25 oral or poster presentations at scientific conferences / workshops and public seminars.

崔佩怡博士現為中文大學生命科學學院講師。她畢業於香港科技大學，並於香港中文大學獲得環境科學碩士及生物博士學位。崔佩怡博士自 2008 年開始在香港進行珊瑚研究。 研究興趣包括珊瑚成長初階段研究，幼苗野外入添量調查，及利用有性繁殖培育珊瑚等復育工作。 崔博士發表了 11 篇學術文章，並在學術會議、研討會和公開講座上口頭或海報演講超過 25 次。

Dr James Kar Hei Fang 方家熙博士

Dr James Kar Hei Fang is a marine ecotoxicologist with his main research foci on the impact of seawater pollution and acidification on marine species at multiple biological levels as well as their ecological functions. He has also developed research interest in marine bioerosion processes, which are of great importance in maintaining ecological health, e.g. of coral reefs. His research has spanned diverse marine environments in tropical, subtropical, subarctic and arctic regions, to date leading to 22 publications (16 first-authored) as book chapters and in peer-reviewed journals such as *Global Change Biology*. Each of his papers has 16 citations on average and his *h*-index is 12 (Google Scholar Citations, accessed on 22 July 2017). In his capacity at various institutions in Hong Kong, Australia, Norway and the Netherlands, to date he has trained or examined four postgraduate students. Currently he is an Assistant Professor at the Hong Kong Polytechnic University and a Chartered Biologist of the UK Royal Society of Biology.

方家熙博士是一位海洋生態毒理學家，主要的研究焦點為探討海水污染和酸化對多營養級海洋物種以及其生態功能的影響；另一方面，方博士亦關注海洋的生物侵蝕過程，這對於維持例如珊瑚礁的生態健康尤其重要。方博士的研究包括熱帶、亞熱帶、亞北極帶和北極帶內的不同海洋環境，至今已發表 22 篇論文（16 篇為第一作者）包括書籍的章節和同行評審的國際期刊例如 Global Change Biology。方博士的論文平均擁有 16 次的引用次數，*h* - 指數為 12（谷歌學術引用，查閱於 2017 年 7 月 22 日）。方博士於香港、澳洲、挪威和荷蘭工作的期間曾訓練或考核 4 位研究生。方博士現為香港理工大學助理教授，同時亦是英國皇家生物學協會的特許生物學家。

Dr Ball Keng Po LAI 黎鏡波博士

In the past few years, Dr Ball Lai has focused on the reproductive toxicological effect and risk assessment of hypoxia and environmental pollutant exposure. His research employs toxicogenomic analysis which combines toxicology with high throughput omics analysis to unravel molecular mechanisms involved in the expression of toxicity, and to determine molecular expression patterns that predict toxicity. Throughout his academic career so far, Dr Lai has published 43 articles in high-tier scholarly journals (including Nature Communications, The EMBO Journal, and Environmental Science & Technology) and secured over HK$ 3 million external competitive funding in the capacity of principal investigator and co-principal investigator.

在過去的幾年中，黎鏡波博士專注于缺氧和環境污染物暴露的生殖毒理效應和風險評估。研究採用結合毒理學與高通量組學分析的基因毒性分析來揭示毒性表達的分子機制變化，並確定預測毒性的分子表達模式。迄今為止，黎博士於高級學術期刊上已經發表了 43 篇文章（包括 Nature Communications, The EMBO Journal 和 Environmental Science & Technology），並以項目負責人和共同項目負責人的身份獲得了超過 300 萬港元的外部研究資助。

Prof. Joe Shing Yip LEE 李成業教授

Prof. Joe Lee is a marine ecologist with particular interest in how animals (including humans) shape the structure and function of coastal wetland ecosystems. His chosen ecosystem is tropical estuaries, particularly those fringed by mangrove forests in Southeast Asia and Australia. Prof. Lee follows a multi-disciplinary approach to understand estuarine ecosystem processes, collaborating with environmental chemists, physical scientists and ecotoxicologists. Prof. Lee plans to work on the "behaviour" of disturbed ecosystems upon rehabilitation and restoration efforts in Hong Kong.

Prof. Lee has published >180 refereed, full-length publications (including books, book chapters, journal papers and conference proceedings but excluding unpublished reports) and has a current h-index of 45 (October 2017). Prof. Lee has graduated ~30 research postgraduate students, and he has served as external examiner for universities in Australia, Singapore, India, Germany, Tanzania, Hong Kong and New Caledonia.

Prof. Lee has been invited to give keynote /plenary lectures on 12 occasions and as a fully-sponsored invited speaker on another 26 occasions at major international conferences. He has acted as a reviewer for >70 international scientific journals and grant agencies including those in the USA, UK, Australia, Belgium, Sweden, France, China, Qatar, the Netherlands and Hong Kong. Prof. Lee is currently on the editorial board of Ocean Science Journal and PLoS One.

李成業教授是一位特別關注於包括人類在內的動物如何影響海岸濕地生態系統的結構和功能的海洋生態學家。他關注的生態系統是熱帶河口，尤其是東南亞和澳大利亞帶有紅樹林的河口。李教授與環境化學家、物理科學家和生態毒理學家合作，採用一種多學科的方法來理解河口生態系統的過程。李教授致力於研究香港受干擾的生態系統在恢復和重建工作中的的"行為"。

李教授已經發表了超過 180 篇經過同行評議的出版物（包括圖書、書章節、期刊論文和會議論文，但不包括未發表的研究報告），目前的 *h* 指數為 45（至 2017 年 10 月）。李教授已經指導畢業了約 30 名研究生，並且曾在澳大利亞、新加坡、印度、德國、坦尚尼亞、香港和新赫里多尼亞大學擔任過校外監審員。
李教授已被邀請在會議上發表 12 次主旨演講和大會報告，並以特邀報告人參加了 26 次主要的國際會議。他擔任過包括美國、英國、澳大利亞、比利時、瑞典、法國、中國、卡達、荷蘭和香港的超過 70 多家國際科學期刊和資助機構審稿人。李教授目前在 Ocean Science Journal 和 PLoS One 擔任編委。

Positions of Members in International Academic Organizations and Government Advisory Committee
SKLMP 成員在國際學術組織及政府諮詢委員會的任職情況

Member	Position	Organization	Duration
Dr. Doris W.T. AU	Member, The Genetically Modified Organisms (GMO) Expert Group	The Agriculture, Fisheries and Conservation Department, Hong Kong SAR Government	2017-2019
	Member, Advisory Council on Food and Environmental Hygiene	Food and Health Bureau, Hong Kong SAR Government	2015-2019
Dr. S.G. CHEUNG	學術委員會委員	廣西北部灣海洋生物多樣性養護重點實驗室	2017-2020
Prof. Joe S.Y. LEE	External Academic Advisor	Department of Chemistry, City University of Hong Kong	2015-2017
Prof. Kenneth M.Y. LEUNG	Academic Committee Member	The State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environmental Sciences, China	Since 2016
	Founding Fellow	The Hong Kong Institute of Qualified Environmental Professionals, Hong Kong	Since 2016
Prof. Nora F.Y. TAM	Honorary Professor	Jinan University, China	
	External Assessor for Associate Professor/ Professor	University of Malaya, Malaysia	
Prof. Ying LI	Honors Professor	Faculty of Dentistry, The University of Hong Kong	Since 2016
	Honors Professor	Health Science Centre, Peking University	Since 2016
	Honors Principle Investigator	Brain Research Institute, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science	Since 2016

Positions of Members in International Academic Journals
SKLMP 成員在國際學術期刊的任職情況

Member	Position	Name of Academic Journal	Duration
Prof. H.B. LIU	Editor	Journal of Oceanography	Since 2012
	Associate Editor	Frontiers in Microbiology	Since 2016
	Associate Editor	Frontiers in Marine Science	Since 2013
	Editorial Board Member	Journal of Plankton Research	Since 2008
	Editorial Board Member	Scientific Reports	Since 2014
Prof. Joe S.Y. LEE	Academic Editor	PLoS One	Since 2014
	Editorial Board Member	Ocean Science Journal, Springer	Since 2015
Prof. Kenneth M.Y. LEUNG	Editor-in-Chief	Regional Study in Marine Science (Elsevier)	Since 2014
	Subject Editor	Integrated Environmental Assessment and Management (Wiley)	Since 2010
	Subject Editor	Environmental Science and Pollution Research (Springer)	Since 2015
	Editorial Board Member	Marine Pollution Bulletin (Elsevier)	Since 2008
	Editorial Board Member	Toxicology and Environmental Health Sciences (Springer)	Since 2009
	Editorial Advisory Board Member	Canadian Journal of Zoology (NRC Res.)	Since 2011
	Editorial Board Member	Ocean Science Journal (Springer)	Since 2012
	Editorial Board Member	PeerJ (Peer Inc.)	Since 2016
Prof. Paul K.S. LAM	Member, Editorial Advisory Board	Environmental Science and Technology	Since 2010
	Member, Editorial Board	Environmental Chemistry	Since 2010
	Associate Editor	Journal of Environmental Sciences	Since 2015
	Subject Editor	Ecosystem Health and Sustainability	Since 2014
Prof. Peter K.N. YU	Editor	Open Physics Journal	Since 2015
	Advisory Editorial Board Member	Nuclear Technology & Radiation Protection Journal	Since 2010
	Editorial Board Member	Journal of Environmental Radioactivity	Since 2005

Research Student
研究生

Member	Student	Degree	Status
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	Jiezhang MO	PhD	Ongoing
	Yanxia LI	PhD	Ongoing
	Teng WAN	-	Ongoing
Dr. J.W. QIU	Ting XU	PhD	Ongoing
	Yanjie ZHANG	PhD	Ongoing
	Zhi WANG	PhD	Ongoing
	Chi Ho IP	PhD	Ongoing
	Yip Hung YEUNG	MPhil	Ongoing
Dr. James K.H. FANG	Tessa de BRUIN	MSc	Graduated in 2017
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	Michele MEI	MPhil	-
Prof. J.P. GAN	Dou LI	MPhil	Ongoing
	Yao TANG	MPhil	Ongoing
	Wai Pang TSANG	MPhil	Ongoing
Prof. Joe S.Y. LEE	Yan Cheuk LEE	PhD	Ongoing
Prof. Kenneth M.Y. LEUNG	King Yan MAK	PhD	Graduated in 2017
	Katie YEUNG	PhD	Ongoing
	Qi HUANG	PhD	Ongoing
Prof. Michael H.W. LAM	Man Shan YAU	PhD	Ongoing
	Ka Ki YUEN	PhD	Ongoing
Prof. Michael M.S. YANG	Heng ZOU	PhD	Graduated in 2017
	Liang CHEN	PhD	Ongoing
	Sung King AU YEUNG	MPhil	Ongoing
Prof. Nora F.Y. TAM	Ying PAN	PhD	Graduated in 2017
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	Reece WARTENBERG	PhD	Ongoing
	Zhen WU	PhD	Ongoing
	Xin LI	PhD	Ongoing
Dr. Leo L. CHAN	Likun WEI	PhD	Ongoing
	Ki Chun YIP	PhD	Ongoing
	Wai Hin LEE	PhD	Ongoing
	Walter DELLISANTI	PhD	Ongoing
Prof. S.H. CHENG	Wai Tsun LI	PhD	Graduated in 2017
Prof. W.X. WANG	Jian WANG	PhD	Graduated in 2017
	Qijun YIN	MPhil	Graduated in 2017
	Zishuan SHAO	PhD	Ongoing
	Yunlong LI	PhD	Ongoing
	Neng YAN	PhD	Ongoing
Prof. Ying LI	Bing CAO	PhD	Graduated in 2017
	Zafar IQBAL	PhD	Ongoing

Research Grants Undertaken by Researchers
SKLMP 研究人員承擔的科研項目

Member	Name of Researchers	Title	Funding Scheme	Project Title	Duration	Amount
Prof. Paul K.S. LAM	Dr. Meng YAN	Senior Research Associate	NSFC (Young Scientists)	The Toxicology of Pacific Ciguatoxin-1 on Reproduction and Early Development in *Oryzias melastigma* 雪卡毒素對海水青鱂繁殖力以及早期發育毒理學效應的研究	1 Jan 2015 | 31 Dec 2017	CNY 260,000
	Dr. Priscilla T.Y. LEUNG	Research Fellow	ITF	Development of a DNA-based Platform for Marine Toxic Algal Species Identification	1 Jan 2016 | 31 Dec 2017	HKD 719,900
			ITF (Internship Program)	Development of a DNA-based Platform for Marine Toxic Algal Species Identification - Internship Programme	1 Sep 2016 | 31 Dec 2017	HKD 218,000
			NSFC (General)	Comparative Study on Transcriptome and Toxicity of *Gambierdiscus* spp. to Ocean Acidification and Temperature Effect 海洋酸化與溫度變化對綱比甲藻轉錄組與毒性的比較研究	1 Jan 2016 | 31 Dec 2019	CNY 740,000
Dr. Leo L. CHAN	Dr. Jiajun WU	Scientific Officer	NSFC (Emergency Management)	China Scientific Safety Diving Promotion Program 中國科學安全潛水推廣計劃	1 Jan 2017 | 31 Dec 2017	CNY 180,000
			NSFC (General)	Composition and Geographical Distribution Pattern of Species in Genus *Gambierdiscus* in Typical Habitats of the East-South China Seas 岡比甲藻在東海 - 南海典型棲息地的組成和地理分佈	1 Jan 2017 | 31 Dec 2020	CNY 146,000
			Open Science Fund of State Key Laboratory of Satellite Ocean Environment Dynamics, SIO, SOA	Study on the Mechanism, Monitoring and Prediction of Harmful Algal Blooms in Typical Coastal Waters 近海典型海域有害藻華的機理、監測與預測技術研究	1 Jan 2017 | 31 Dec 2018	CNY 250,000
Prof. X.D. LI	Dr. Jinli CUI	Postdoctoral Fellow	NSFC (Young Scientists)	Study on the Key Process of Microbial Redox Transformation and Migration of Arsenic in the Shallow Groundwater System of the PRD Region 珠江三角洲淺層地下水體系砷的微生物氧化還原轉化及遷移關鍵過程研究	1 Jan 2017 | 31 Dec 2019	CNY 190,000

Positions of Researchers in International Academic Journal
SKLMP 研究人員在國際學術期刊的任職情況

Member	Name of Researchers	Position	Name of Academic Journal	Duration
Prof. X.D. LI	Dr. Ling JIN	Editor	Environmental Toxicology and Chemistry	1 Jan 2018- 31 Dec 2020

Academic Exchange and Laboratory Management
開放交流與運行管理

Academic Exchanges and Cooperation 學術交流與合作

Academic Meetings and Conferences 學術會議及講座

The SKLMP 2016 Annual and Academic Committee Meeting was Successfully Held
海洋污染國家重點實驗室 2016 年年度會議成功召開

From 19 to 20 January 2017, the SKLMP 2016 Annual and Academic Committee Meeting was successfully held in the City University of Hong Kong. Several Academic Committee Members and International Advisory Committee Members, namely Prof. Jilan SU, Prof. Minhan DAI, Prof. Jay Jianying GAN, Prof. John P. GIESY, Prof. Min HU and Prof. Feng CHEN, attended the meeting with several invited guests from overseas and mainland China and delegates from SKLMP member institutions.

During the opening ceremony, to great applause, Prof. Paul Kwan Sing LAM, Director of the SKLMP, delivered a speech to welcome the guests and expressed sincere gratitude to them for their support in the establishment and development of the SKLMP.

This meeting was primarily composed of three parts: presentations from the SKLMP Research Fund Program, the SKLMP Director's Report, and the Academic Assessment Committee Meeting. Presentation of the SKLMP Research Fund program involved highlighting the research of SKLMP members and reports on SKLMP research projects. Members of the SKLMP, including Dr. Jianwen QIU and Prof. Kenneth Mei Yee LEUNG, reported the highlights of their research, explained their latest research ideas and directions, and discussed them in-depth with the guests. During the presentation of the SKLMP Research Report, Dr. Richard Yuen Chong KONG and Prof. Peter Kwan Ngok YU amongst others presented their research developments and shared their latest achievements. Following this, Prof. Paul Kwan Sing LAM delivered the SKLMP Director's Report, covering research progress, laboratory platform construction, the grant program, academic exchanges and cooperation. To conclude, the Academic Committee Members ratified the SKLMP's work progress in 2016. They also considered that the caliber of laboratory scientific research and innovation is continually improving and noted the positive development of research talent, sound functioning of the platform facilities, and the continuation of outreach work with

海洋污染國家重點實驗室 2016 年年度會議於 2017 年 1 月 19 日至 20 日在香港城市大學成功召開。出席本次會議的嘉賓有蘇紀蘭院士、戴民漢教授、甘劍英教授、John P. GIESY 教授、胡敏教授、陳峰教授等多位學術委員會及國際顧問委員會委員和來自海內外特邀嘉賓以及實驗室成員。

會議首日，伴隨著陣陣掌聲，實驗室主任林群聲教授進行了開幕致辭，對各位嘉賓的到來表示了熱烈歡迎，並對各位專家長期以來對重點實驗室的建設和發展所給予的支持和幫助表達了由衷的感謝。

此次會議主要由 SKLMP 研究項目報告、主任工作報告及學術委員會評議三部分組成。SKLMP 研究項目報告包括實驗室成員研究焦點的介紹及實驗室研究項目報告，在研究焦點中邱建文博士、梁美儀教授等多位 SKLMP 成員分別根據各自的研究焦點進行了匯報，並向嘉賓講解了最新研究觀點和方向，更與嘉賓進行了深入的探討及交流。在實驗室研究項目報告中，江潤章教授、余君岳教授等 SKLMP 成員分別介紹了各自負責的項目進展情況及創新成果分享，並對項目未來的研究方向進行了匯報。在主任報告中，林群聲教授對 SKLMP 2016 年的各項研究進展和成果、實驗室平台建設與資助計劃、學術交流與合作等方面進行了詳細的主任工作匯報。在學術委員會評議部分，學術委員會委委員充分肯定了 SKLMP 在 2016 年 的工作，認為實驗室科學研究水平與創新能力持續提升、人才隊伍建設良性發展、平台設施運轉良好、學術交流與合作活躍、公眾開放與社會服務持續開展。同時對於即將到來的五年評估，各位專家教授就代表性研究成果的選取、展示都提出了切實可行的寶貴意見和建議，並認為在展示代表性

the public and wider society. For the upcoming five-year review, every expert or professor in the meeting put forward practical and valuable suggestions on the selection and presentation of representative research outcomes. They stressed that attention should be paid to the manner in which the research outcomes were presented. It was also suggested that four research directions should revolve around one core research focus mission. In addition, Prof. Su proposed that expert opinions from different national and academic backgrounds should be taken into account, so as to prepare a comprehensive assessment report. Prof. Dai, after sharing the experience of the State Key Laboratory of Marine Environmental Science, Xiamen University, (MEL) five-year reassessment, recommended that we should focus on demonstrating the contribution of the SKLMP as an international platform and a connecting platform between Hong Kong and the mainland.

Finally, Prof. Paul Kwan Sing LAM on behalf of the SKLMP expressed sincere thanks to all guests for their valuable comments which he would refer to members in the process of preparing the 5-year review plan. Moreover, efforts will be made to achieve even better results and to improve the academic level and influence in the next year.

成果時要注意成果講述的方式和思路，建議圍繞一個主軸展開四個研究方向上的研究成果。此外，蘇紀蘭院士提出在評審過程中要綜合考慮不同國家背景、不同學術背景的專家意見，從而更全面地準備評估報告。戴民漢教授在分享了往年重點實驗室的評估經驗後，建議我們要著重展示 SKLMP 作為國際平台、作為香港與內地的連接平台的貢獻性。

最後，林群聲教授代表 SKLMP 對學術委員們給予的寶貴意見和建議表達了誠摯的感謝，並表示會在即將到來的實驗室五年評估工作中積極參考委員們的意見。此外，在新的一年實驗室將努力再創佳績，全面提高實驗室的學術水平和影響力。

The SKLMP 2016 Annual and Academic Committee Meeting was Successfully Held

The Third International Conference on Underwater Science, Technology and Education
第三屆水下科學、技術與教育國際會議

Diving has become an integral and valuable skill in underwater scientific research for fields such as biology, oceanography, archaeology or ecology. As the name suggests, scientific divers are both researchers and divers. Therefore, beyond their diving technical skills, scientific divers have to know and apply aspects of physics, chemistry, biology and physiology relevant to diving, on top of completing certification training in underwater sampling and observation. These requirements ensure that proper diving techniques become second nature so that divers can safely conduct investigations and sample collections. As a result of these needs in scientific diving, the Third International Conference on Underwater Science, Technology and Education was held in Dapeng, Shenzhen from 24 to 28 July 2017. The conference provided practical scientific diving education and discussed the establishment of an international scientific diving system.

This year's conference was supported by the National Natural Science Fund and jointly organized by the Shenzhen Key Laboratory of Marine Biodiversity of the Shenzhen Institute of City University of Hong Kong, the SKLMP of the City University of Hong Kong and Shenzhen City Blue Diving Club. The conference was based upon iterations from the past two years and the 2014 International Symposium on Diving Education and Application. Participants came from institutions across China and Hong Kong, including the City University of Hong Kong, Ocean University of China, Zhejiang University, National Marine Forecasting Center, and the First, Second and Third Oceanographic Research Institutes from the State Oceanic Administration.

The conference offered open water dive training, scientific dive training, and a series of seminars, which included "Innovation Technology in Marine Underwater Research," "Long Term Conservation Plan for the Ocean: The Coral Reef Census Foundation," and "An Introduction to Coral Development and Biodiversity". During the five days of training, 14 participants successfully completed the Open Water Diving Course, and eight participants completed the Introduction to Scientific Diving Course.

潛水已經成為水下科學研究的重要工具，無論是生物學家、海洋學家、考古學家、生態學家，都仰賴科學潛水去收集有關各自領域的水下科學資料。科學潛水員既是研究員，也是潛水員，除了潛水技能，他們還需要具備相關的潛水生理醫學、海洋物理、化學、生物等知識，並接受水下觀察和收集水下科學資料的培訓與認證，使潛水技術成為第二本能，才能安全地進入水下採樣和調查。在此需要下，第三屆水下科學、技術與教育國際會議于 2017 年 7 月 24-28 日在深圳大鵬成功舉行，會議提供了實用的科學潛水技能培訓並與參與者探討了科學潛水體系的建立。

本次會議由國家自然科學應急管理基金支持，以 2014 年啟動的國際潛水教育與應用研討會及 2015 年啟動的水下科 學、技術與教育國際會議為基礎，由香港城市大學深圳研究院深圳海洋生物多樣性重點實驗室及香港城市大學海洋污染國家重點實驗室聯合主辦，深圳市深藍潛水俱 樂部協辦。參與者來自香港城市大學、中國海洋大學、浙江大學、國家海洋環境預報中心、國家海洋局第一、第二及第三海洋研究所。

會議包括開放水域潛水培訓、科學潛水培訓及系列科學潛水講座，後者具體包括【水下研究海洋創新技術】、【拯救海洋 長期保護計劃：珊瑚礁普查基金會】、【珊瑚發育階段和珊瑚生物多樣性簡介】。通過為期 5 天的培訓，共有十四位學員順利完成開放水域潛水員課程，八位學員順利完成科學潛水員入門課程。

Although many areas were not perfect and time was a limiting factor - this was the first conference held in mainland China and with open water and scientific dive training provided - we are still grateful to the organizing partners for their support and efforts. The cooperation between Hong Kong and the mainland's research institutions at this conference demonstrated the camaraderie and respect between the regions. We will also utilize the valuable feedback provided by students to further improve the conference's training programs in the future.

Through the training at this conference, participants and students can now access the underwater world and broaden the scope of their research. We believe that everyone can combine their expertise, passion, and research background to further China's development and innovations in oceanography, underwater techniques, and education.

對於首次在內地成功舉辦開放水域潛水員及科學潛水員培訓課程，由於時間倉促，有很多地方做得不夠完善，但仍然得到大學、研究院及潛水俱樂部的支持和理解，表示衷心感謝。這次內地及香港的學術合作，顯示了血濃於水的同胞感情，海納百川，有容乃大的海洋人胸懷。學員以生命給了我們很多的寶貴意見，我們一定會繼續完善及優化我們的教學方式與內容，讓大家有更好的下一次再會于深藍之中。

學員借著掌握潛水技能，可以進入深藍世界，大大拓展了生活與科研活動的範圍，深信大家能夠利用己身的學術背景探索深藍世界，學員的認真、刻苦、熱情與熱枕的海洋文化與精神也將為未來中國海洋科學、技術與教育的發展譜寫嶄新篇章

The Third International Conference on Underwater Science, Technology and Education

The Croucher Advanced Study Institute on Impacts of Eutrophication, Pollution and Harmful Benthic Microalgae Blooms on Coastal Coral Reef Ecosystems with Using the CISME Device and Molecular Techniques as Complimentary Research Tools

裘槎高等研究院：通過 CISME 設備和分子技術研究富營養化和有害底棲微藻爆發對沿海珊瑚礁生態系統的影響

The Croucher Advanced Study Institute (ASI) is a high-level teaching activity where a carefully defined subject, systematically presented, is treated in depth by lecturers of international standing, and new advances in a subject, not taught elsewhere, are reported in tutorial form.

The ASI on Impacts of Eutrophication, Pollution and Harmful Benthic Microalgae Blooms on Coastal Coral Reef Ecosystems with Using the CISME Device and Molecular Techniques as Complimentary Research Tools was held from 1st to 4th August 2017 at City University of Hong Kong by Dr. Leo Chan as the Course Director. It aimed to give inspiring lectures to researchers, practicing professionals and advanced students on the research frontiers of coral research for protection, conservation and restoration of the world-wide endangered coral ecosystems. This ASI comprised four days of lectures, presentations, hands-on training, field work training and roundtable discussion at the end of each day to wrap up and summarize findings. The participants can also expressed their own work through poster presentation. Participants of this ASI were senior established scientists mainly from Hong Kong. Five senior scientists from mainland China, Malaysia and Thailand were also participated in the ASI. A small number of doctoral or postdoctoral researcher and government officer from Agriculture, Fisheries and Conservation Department in Hong Kong were participated as observers so as to nurture young scientists in the field of coral ecology, conservation and management and introduce the use of advance tools to Hong Kong Government.

裘槎高等研究院（ASI）是一項高級別的教學活動，在這個活動中會由國際知名講師系統地呈現一個精心定義的主題，並且以教程形式報告未在別處教授的主題的新進展。

2017 年 8 月 1 日至 4 日，陳荔博士作為課程主任在香港城市大學舉辦了通過 CISME 設備和分子技術研究富營養化和有害底棲微藻爆發對沿海珊瑚礁生態系統的影響的裘槎高等研究院活動，旨在為研究人員，實踐專業人員和高級學生在保護、保育和修復全球瀕危珊瑚生態系統的珊瑚研究前沿方面提供啟發性的講座。此次 ASI 包括為期四天的講座，報告，實踐培訓，野外工作培訓和每日圓桌總結討論。參與者還可以通過海報展示自己的工作。ASI 的參與者主要來自香港的資深科學家。來自中國大陸，馬來西亞和泰國的五位高級科學家也參加了 ASI。少數博士及博士後研究員和來自香港漁農自然護理署的政府官員作為觀察者參加了會議，以培養珊瑚生態學，保育和管理領域的年輕科學家，並向香港政府介紹先進工具的使用。

January

From 3 to 4 January 2017, Dr Leo Lai Chan and Dr Jiajun Wu were invited to visit The Second Oceanographic Research Institute of the National Oceanic Bureau in Hangzhou and The Zhejiang University. During the visit, Dr Chan had in-depth discussions with the researchers on marine science research, marine pollution, environmental protection education, and other aspects.

2017 年 1 月 3 日至 4 日，陳荔博士和吳佳俊博士受邀參觀了杭州國家海洋局第二海洋研究所以及浙江大學。期間與研究員們就海洋科學研究，海洋污染，環境保護教育等方面展開了深入的交流和討論。

June

In June 2017, Dr Leo Lai Chan and Dr Jiajun Wu were invited to Thailand to attend the Ninth Session of the Sino Thai Marine Science and Technology Cooperation Project. Dr Chan and scientific researchers from various research institutes in Thailand jointly discussed the light layers of coral biodiversity, development of genetic resources and natural products, marine ecosystem and human health and safety, development of a scientific diving system. They had a strong interest in cooperation, with the use of an open fund to carry out the pilot laboratory study plan.
Dr Chan said that he was very willing to work with the team which was interested in The One Belt and One Road under water scientific research, particularly in the coral reef ecosystem, from the epipelagic to the mesopelagic zones.

2017 年 6 月，陳荔博士和吳佳俊博士受邀前往泰國出席了第九屆中泰海洋科學與技術合作項目的會議。期間，陳荔博士與泰國各科研院校的科学研究員們共同討論了中光層珊瑚環境生物多樣性、基因資源及天然產物開發、海洋生態系統及人類健康與安全、科學潛水體系的發展等，產生了濃厚的合作興趣，並利用實驗室開放基金開展先導研究計劃。陳荔博士表示非常願意與有興趣建立一帶一路水下科學研究的團隊合作，尤其是從淺海至中光層的珊瑚礁生態系統。

Dr Leo Chan with his U.S. collaborators, has been granted the Partnerships for International Research and Education ward from U.S. National Science Foundation on "Advancing Global Strategies and Understanding on the Origin of Ciguatera Fish Poisoning in Tropical Oceans". The project will investigate the threat to coral reef ecosystems by ciguatera fish poisoning, the most common nonbacterial seafood illness. This project will extend understanding of the environmental conditions affecting the production of ciguatoxins, and determine the fate of the toxins through the food web across geographical regions.

陳荔博士作為中方合作者，成功與美方合作者就"推進對熱帶海域西加魚中毒的起源的全球戰略和認識"獲批了美國國家科學基金會國際研究與教育夥伴計劃。本專案將調查最常見的非細菌性海鮮疾病西加魚毒中毒對珊瑚礁生態系統的威脅，進一步瞭解環境條件對生成西加毒素的影響，並通過食物網確定毒素在不同地理區域的歸趨。

September

From 16 to 18 September 2017, Dr Leo Lai Chan and Dr Jiajun Wu were invited to visit the State Key Laboratory for Satellite Marine Environmental Dynamics (SOED). During the visit, Prof. Fei Chai, (Director of the SOED), young scientists of the Second Institute of Oceanography, National Oceanic Administration, and Dr Chan jointly carried out academic exchanges, and have in-depth discussions, and awarded certificates to scientific divers.

2017 年 9 月 16 日至 18 日，陳荔博士和吳佳俊博士受邀參觀衛星海洋環境動力學國家重點實驗室。期間與實驗室主任柴扉教授及國家海洋局第二海洋研究所年輕科學們進行了深入的學術交流與討論，並且頒發了首批潛者聯盟的科學潛水員的證書。

September

From 21 to 24 September 2017, Dr Leo Lai Chan and Dr Jiajun Wu went to Vladivostok in Russia to visit the Institute of Marine Technology Problems (IMTP), Far Eastern Branch of the Russian Academy of Sciences and the Russian Far East Federal University with Dr Alexander Scherbatyuk from the Russian Academy of Sciences. Through various exchanges and discussions, both agreed to jointly develop robotic technology that could attach quickly onto a shark via biomimicry of commensal remora fish. They hope that this robot could promote people's understanding of sharks through the tracking of their ethology and collection of samples from the sharks' bodies.

In the meantime, the Shenzhen Key Laboratory for the Sustainable Use of Marine Biodiversity, City University of Hong Kong Shenzhen Research Institute, IMTP and College of Automation, Harbin Engineering University signed a strategic cooperation agreement on the development of Research and Innovation Technologies for Underwater Extreme Environments. This collaboration will bring forth the design, implementation, deployment and evaluation of advanced diving technologies including semi-autonomous underwater vehicle (AUV) with optical link, joint divers and semi-AUV TSL operation, and Marine Autonomous Robotic Complex. Through the development of underwater instruments and scientific safety diving education, the capabilities of underwater scientific research, marine investigation and exploration in China will be enhanced. At the same time, it will strengthen the development of underwater sciences in greater China, promote global cooperation and raise public awareness of marine conservation.

2017 年 9 月 21 日至 24 日，陳荔博士和吳佳俊博士遠赴俄羅斯符拉迪沃斯托克，跟隨俄羅斯科學院院士 Dr. Alexander Scherbatyuk 一起參觀了俄羅斯科學院遠東分院海洋技術問題研究所、俄羅斯遠東聯邦大學等。期間陳荔博士與 Alexander 院士進行了深入的學術交流和討論，雙方表示會聯合研發可快速吸附於鯊魚身體上的的軟體吸盤機器人，希望從追蹤鯊魚的日常活動，瞭解其生活習性，並具有活體採集樣本的功能。

同時香港城市大學深圳研究院深圳海洋生物多樣性可持續利用重點實驗室、俄羅斯科學院遠東分院海洋技術問題研究所及哈爾濱工程大學自動化學院達成了關於開展水下極端環境研究和創新技術的戰略性合作協議。這次合作將帶來新的科學發現和先進潛水技術包括光路連接的半自主水下航行器，潛水員和半潛式水下航行器聯合作業以及智慧海洋機器人系統的設計，實施，部署和評估。通過水下儀器設備及科學安全潛水教育的研究和開發，提高中國水下科學研究、海洋調查和勘探的能力。同時加強大中華區水下科學的發展，促進全球合作，提高保護海洋的公眾意識。

November

On 8 November 2017, the First Institute of Oceanography, SOA, and the SKLMP of the City University of Hong Kong jointly held the first seminar on "Marine Innovation and Advanced Observation". More than 20 experts and scholars from Hong Kong and mainland China attended the seminar and discussed topics such as western Pacific paleoceanography; mathematical modelling of ocean and climate; monitoring and protection of coral reef ecosystems; "source-sink" dynamics and paleoenvironmental records of the Bay of Bengal; absolute sea level change in China's coastal areas; research on marine endangered species; remote sensing monitoring of coral reefs and mangroves; and new technology for marine frontier observation and research.

Participants agreed upon promoting research on marine innovation; development and the demonstration of advanced ocean observation technology; the construction of the "Twenty-first Century Maritime Silk Road" ; and personnel training in the new era. This meeting also outlined a preliminary framework for the establishment of the "Joint Center for Marine Innovation Technologies and Advanced Ocean Observation" in Hong Kong.

All participants agreed to push forward exchanges and cooperation between the Mainland and Hong Kong in the field of marine affairs and would implement the above consensus as soon as possible.

2017 年 11 月 8 日，國家海洋局第一海洋研究所與香港城市大學海洋污染國家重點實驗室聯合召開了首屆“海洋創新與先進觀測研討會”。雙方 20 餘位專家學者參加了研討會，圍繞科學前沿與技術創新這一主線，分別從西太平洋古海洋學、海洋與氣候數值類比、珊瑚礁生態系統監測與保護、孟加拉灣中部“源 - 匯”過程及古環境 沉積記錄、中國近海絕對海平面變化研究、海洋瀕危物種研究、珊瑚礁與紅樹林遙感監測以及新技術支持的海洋前沿觀測與研究等方面進行了深入的交流和研討。

與會雙方在推動海洋創新研究、開展先進海洋觀測技術研發與示範、助力“21 世紀海上絲綢之路”建設以及新時代人才培養方面達成共識，初步確立了優勢互補的合作框架以及在香港建立“海洋創新與先進觀測聯合中心”的意向。

雙方同意將致力於推動內地與香港再海洋領域的交流合作，將盡快落實上述共識。

A presentation from Mr. Fangli Qiao

Dr Leo Lai Chan presenting his work

December

From 1 to 3 December 2017, the "Thousand People Plan" Expert Association Symposium on Energy, Resources and Environment was held in Ningde, Fujian, sponsored by the Energy, Resources and Environment Specialized Committee. The symposium was divided into three topics: Marine Resources and Marine Economy; New Energy Technology and Equipment; and Green Ecology and Intelligent Environmental Protection. Dr Leo Lai Chan was invited to attend the symposium and discussed freely with experts as well as invited guests the "Thousand People Plan"

2017 年 12 月 1 日至日，由能源、資源與環境專業委員會主辦的“千人計劃”專家聯誼會能源、資源與環境專業委員會 2017 年研討會在福建寧德舉辦。此次平行論壇分為海洋資源與海洋經濟、新能源技術與裝備、綠色生態與智慧環保三個主題論壇。陳荔博士受邀出席了討論會，與相關領域國家“千人計劃”專家、特邀嘉賓等暢所欲言，圍繞課題展開了深入的交流討論。

Scholars and Students Exchange 學者與學生交流

2017 Visiting Scholars

Dr. Pengbin WANG 王鵬斌
The Second Institute of Oceanography, State Oceanic Administration (SOA)
國家海洋局 第二海洋研究所

Prof. Edwin Alan VERDE
Maine Maritime Academy
緬因州海事學院

Prof. Jay Jianying GAN 甘劍英
The University of California, Riverside
加州大學河濱分校

2017 PhD Students

Yinhua CUI 崔銀花
University of Science and Technology of China
中國科學技術大學

Meng GE 葛夢
University of Science and Technology of China
中國科學技術大學

Ruoyu HU 胡若愚
University of Science and Technology of China
中國科學技術大學

Yuan LIU 劉源
University of Science and Technology of China
中國科學技術大學

Kai ZHANG 張凱
Institute of Hydrobiology, Chinese Academy of Sciences
中國科學院水生生物研究所

2017 Visiting Students

Jingchun SHI 史經春
Shantou University
汕頭大學

Bowen LI 李博聞
Ocean University of China
中國海洋大學

Seminars / Workshops

Date	Name of Speaker	Title of Talk
13-Jan-17	Prof. Jay GAN	Writing a Publishable Manuscrip
16-May-17	Prof. Sandra E. SHUMWAY	Shellfish as Mitigators of Coastal Eutrophication – How much can they really do?
31-Aug-17	Prof. Hongwen SUN	Sources and Distribution of Perfluorinated Compounds (PFCs) in the Environment
15-Sep-17	Dr Alexander SCHERBATYUK	The Mobile Navigation and Group Operation of Autonomous Marine Vehicles
13-Nov-17	Prof. Massimo PONTI	The Health of Coral Reefs in Indonesia
13-Nov-17	Ms. Eva TURICCHIA	Citizen Science and experiences carried out in the Mediterranean Sea
05-Dec-17	Prof. Warren BURGGREN	Developmental Plasticity, Fetal Programming and Epigenetics
05-Dec-17	Prof. Warren BURGGREN	Writing Winning Grant Proposals
08-Jan-18	Dr Yung-Che TSENG	Predicting Homeostatic Effects on Marine Medaka to Enable Addressing the Impacts of Ocean Acidification

Delegation

Date	Name of Institution
21-Mar-17	Fudan University 復旦大學
02-Jun-17	National Natural Science Foundation of China (NSFC) 國家自然科學基金委員會
15-Aug-17	Shanghai Maritime University 上海海事大學
09-Oct-17 ~ 12-Oct-17	State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, State Oceanic Administration 衛星海洋環境動力學國家重點實驗室（國家海洋局第二海洋研究所）

Attendance at International Conference & Titles of Presentations

出席的國際會議與報告標題

Dr. Doris Wai Ting AU

Stem cells for tooth replacement: facts or fiction?
Fish Bone Workshop - European Calcified Tissue Society (ECTS) Congress
12 May 2017, Salzburg, Austria
Participant, Oral

Transgenerational impacts of estrogenic EDCs on reproductive success: Elucidating the genetic and epigenetic mechanisms
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Oral

Hypoxia induces epigenetic changes and causes transgenerational impairments in reproduction of fish
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Poster

Transgenerational effect of estrogenic endocrine disrupting chemicals on female reproduction in fish
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Poster

Transgenerational effects of hypoxia on female reproduction in fish
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Poster

Deciphering the molecular and cellular pathways associated with epigenetic inheritance of bone deformities induced by benzo(a)pyrene, using the unique medaka models
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Poster

The scope of epigenetic inheritance - transgenerational skeletal toxicity of benzo[a]pyrene in the vertebrate bone model *Oryzias latipes*
Gordon Research Conference on Germinal Stem Cell Biology
18-23 Jun 2017, The Chinese University of Hong Kong, Hong Kong
Participant, Poster

Benzo(a)pyrene induces cross-generational bone deformities in fish: the underlying molecular and cellular mechanisms
9th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 19)
30 Jun-3 Jul 2017, Matsuyama Japan
Participant, Oral

Transgenerational bone toxicity of benzo(a)pyrene in fish
9th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 19)
30 Jun-3 Jul 2017, Matsuyama Japan
Participant, Oral

Environmental benzo[a]pyrene is a transgenerational skeletal toxicant – a novel discovery using the medaka bone model
18th International Symposium on Toxicity Assessment (ISTA17)
16-27 Jul 2017, Limeira, Brazil
Invited Speaker, Oral

The impacts of estrogenic EDCs on fish population sustainability: A definitive need for multigenerational risk assessment
18th International Symposium on Toxicity Assessment (ISTA17)
16-27 Jul 2017, Limeira, Brazil
Invited Speaker, Oral

Dr. Leo Lai CHAN

Marine innovation technologies for aquaculture and underwater research
Research Showcase 2017 - Frontier Research and Innovation@CityU
10-13 Apr 2017, Hong Kong
Invited Speaker, Oral

Marine innovation technologies for underwater scientific research, from marine biotoxin research to scientific diving education
The 3rd International Conference on Underwater Sciences, Technology and Education (ICUSTE 2017)
24-28 Jul 2017 Shenzhen, China
Invited Speaker, Oral

Research on and development of key innovation technologies for marine genetic resources and natural products discovery from mesophotic coral environments and hydrothermal vents
The 9th Thailand-China Joint Workshop on Ocean Science and Technology Cooperation
30 May-2 Jun 2017, Thailand
Invited Speaker, Oral

Development of marine innovation technologies for underwater scientific research
Advanced Study Institute (ASI) on Impacts of Eutrophication, Pollution and Harmful Benthic Microalgae Blooms on Coastal Coral Reef Ecosystems with Using the CISME Device and Molecular Techniques as Complimentary Research Tools
1-4 Aug 2017, Hong Kong
Invited Speaker, Oral

Ocean guardian: Diving into future
2017 Innotech Expo
24 Sept-2 Oct 2017, Hong Kong
Invited Speaker, Oral

Development of key innovation technologies for genetic resources and natural products discovery of the marine microperiphyton, from Sources to Clinical Reality
2017 International Marine Drug Symposium
5-9 Nov 2017, Qingdao, China
Invited Speaker, Oral

Prof. Shuk Han CHENG

Telemedicine & eHealth section meeting (Royal Society of Medicine (RSM) Fellow)
Recent Developments in Digital Health 2017
28 Feb 2017, Royal Society of Medicine, London, UK

Visualisation of cellular compartments: novel phosphorescent biscyclometallated iridium (III) ethylenediamine complexes
EMBO | EMBL Symposium: Molecular and Cell Biology of Membranes
21-23 May 2017, EMBL Heidelberg, Germany
Participant, Poster

Dr. Siu Gin CHEUNG

Challenges and opportunities for the conservation of Asian horseshoe crabs
International Conference on the Conservation of Horseshoe Crabs
25-26 Aug 2017, Bangkok, Thailand
Keynote Speaker, Oral

Gathering knowledge to detect distribution and threats of *Tachypleus tridentatus* in Beibu Gulf, China
24th Biennial Conference of CERF: Coastal Science Inflection Point: Celebrating Success, Learning from Challenges
5-9 Nov 2017, Providence, USA
Participant, Oral

Habitat use of Chinese horseshoe, *Tachypleus tridentatus* under the influence of simulated oyster cultch
24th Biennial Conference of CERF: Coastal Science Inflection Point: Celebrating Success, Learning from Challenges
5-9 Nov 2017, Providence, USA
Participant, Oral

Saving horseshoe crabs through community engagement: Experience from Hong Kong
24th Biennial Conference of CERF: Coastal Science Inflection Point: Celebrating Success, Learning from Challenges
5-9 Nov 2017, Providence, USA
Participant, Poster

Prof. Jianping GAN

Assessments of circulation and physics in China Seas by China-Sea Multi-Scale Ocean Modeling System (CMOMS) and global circulation models
CLIVAR International Symposium on Boundary Currents
Mar 2017, Qingdao, China
Participant, Oral

Extrinsically and intrinsically forced circulation and associated biogeochemical response in China Seas
9th International Workshop on Modeling the Ocean (IWMO)
Jul 2017, Seoul, Korea
Participant, Oral

Prof. Michael Hon Wah LAM

Targeted profiling of neurotransmitters in the central nervous system of marine medaka (*Oryzias melastigma*) for environmental neurotoxicological assessments
Metabolomics Congress 2017
11-13 May 2017, Singapore
Participant, Poster

Prof. Paul Kwan Sing LAM

Community impacts of South Pacific algal toxin exposure at multiple scales
The 2017 AAAS Annual Meeting - Serving Society Through Science Policy
16-20 Feb 2017, Boston, USA
Invited Speaker, Oral

Current status of some important groups of emerging chemicals of concern in the coastal region of South China
The 3rd International Conference on Environmental Pollution and Health
12-14 May 2017, Guangzhou, China
Invited Speaker, Oral

Current status of some important groups of emerging chemicals of concern in the coastal region of South China
International Symposium on Emerging Contaminants and Environmental Nanotechnology (ISECEN)
23-27 May 2017, Nankai University, Tianjin, China
Invited Speaker, Oral

Environmental fate and risks of emerging chemicals of concern in coastal region of south China
The 9th National Conference for Environmental Conference
19-22 Oct 2017, Hangzhou, China
Invited Speaker, Oral

Ecotoxicological evaluation of emerging chemicals of concern
The 9th National Conference for Environmental Conference
19-22 Oct 2017, Hangzhou, China
Plenary Speaker, Oral

Prof. Joe Shing Yip LEE

Not net loss? Implications of large-scale "restoration" projects for global mangrove ecosystem services
IUCN MSG Symposium
Sept 2017, Bremen, Germany
Invited Speaker, Oral

Mangrove ecology, function and fisheries
Second ASEAN Mangrove Congress
Sept 2017, Manila, the Philippines
Plenary Speaker, Oral

Blue carbon resources of China
International Blue Carbon Symposium
Oct 2017, Seoul, Korea
Invited Speaker, Oral

Prof. Kenneth Mei Yee LEUNG

Removal of endocrine disrupting chemicals and retinoic acids from wastewater by novel chemically-enhanced primary sedimentation processes
3rd Conference on Environmental Pollution and Health
12-14 May 2017, Guangzhou Dongfang Hotel, Guangzhou, China
Invited Speaker, Oral

Eco-shoreline designs for sustainable coastal development and revealing ecological risks of endocrine disrupting chemicals in marine protected areas through an integrative approach
Global Marine Science Summit: Coastal Resilience and the Blue Economy
5-8 Nov 2017, University of North Carolina Wilmington, USA
Invited Speaker, Oral

Tracking major endocrine disruptors in coastal waters using an integrative approach coupling field-based study and hydrodynamic modelling
Symposium on Hydro-environment Research for Smart Cities
12-14 Dec 2017, the Hong Kong University of Science and Technology, Hong Kong
Invited Speaker, Oral

Prof. Ying LI

Brain -gut microbiome interaction in chronic visceral pain
Seminar
19 Jul 2017, Nanjing Medical University, China
Participant, Oral

L-lactate signaling facilitates cortex synchrony and decision-making in rats
Seminar
15 Aug 2017, UW Medicine's Neuroscience Institute, USA
Participant, Oral

Oscillations and network synchrony in schema learning and consolidation acting through myelination
Chinese Society of Neuroscience Neuroscience Research Branch 2017 Annual Meeting
5 Oct 2017, Shenzhen, China
Invited Speaker, Oral

Prof. Hongbin LIU

Geographical niche differentiation of Synechococcus communities in the western Pacific marginal seas
JAMSTEC-ZMT Workshop – Plankton biodiversity, dynamic ecophysiology, and ecosystem function
15-17 Feb 2017, Bremen, Germany
Invited Speaker, Oral

Highly diverse unicellular cyanobacterial diazotrophs in the Kuroshio Current and the North Pacific Ocean
11th Cross-Strait Symposium on Marine Science.
22 Aug 2017, Tai-an, China
Plenary Speech, Oral

Dr. Jianwen QIU

Using meta-transcriptomics to understand coral diseases: A case study of coral growth abnormalies
The 7th Cross-Strait Coral Reef Conference
19-23 Jun 2017, Kenting, Taiwan
Participant, Oral

Mussel genomes reveal adaptations to the deep-sea
International Conference on Genomics-Ocean
7-8 Sept 2017, Qingdao, China
Invited Speaker, Oral

Communal Platforms and Databases 共享平台和數據庫

Communal Platform 共享平台

Member	Communal Platform	Access Level	Description of the Platform
Prof. X.D. LI	University Facility on Chemical and Environmental Analysis	Researchers	Advanced Facility on Cutting Edge Analysis for Chemical and Environmental Research at PolyU

Databases 數據庫

Member	Database	Database URL	Access Level	Application and Citation
Dr. Ball K.P. LAI	Conserved miRNA in the Marine Medaka *Oryzias melastigma*	https://www.ncbi.nlm.nih.gov/sra/?term=SRP041922	Open to Public	Application: Ecotoxicological Study of Marine Medaka Citation: JW Li, X Lin, Anna Tse, Angela Cheung, TF Chan, RYC Kong, KP Lai, RSS Wu (2016) Discovery and Functional Characterization of Novel miRNAs in the Marine Medaka *Oryzias melastigma* Aquat Toxicol 175:106-116
	Draft Genome of *Oryzias melastigma*	https://www.ncbi.nlm.nih.gov/sra/?term=SRP065978	Open to Public	
Prof. Kenneth M.Y. LEUNG	The Hong Kong Register of Marine Species	http://www.marinespecies.org/hkrms/	Open to Public	No Application is Needed
	Supplementary Data for the Article entitled: De novo Transcriptome Assembly of the Marine Gastropod *Reishia clavigera* for Supporting Toxic Mechanism Studies	http://www.biosch.hku.hk/ecology/staffhp/kl/data.html	Open to Public	No Application is Needed

Extreme Environments Program-Coral Triangle Expeditions

The Extreme Environments Program began as a result of the City University of Hong Kong's "Discovery Enriched Curriculum," which supports courses that create exploration opportunities for students at extreme locations on Earth. Previously supported initiatives by the Program included visits to the Mojave Desert in 2012, Antarctica in 2013, and the Tu Lan Cave System in Vietnam in 2015.

In February 2017, 23 students from the School of Creative Media and five researchers from the SKLMP conducted a project at the Coral Triangle as two teams. The dive team studied the lush reefs and underwater wildlife of Sipidan and Mabul in Malaysia. Meanwhile, the island team conducted work on the culture and ecosystem in the Arnavon Islands, a remote western region of the Solomon Islands threatened by rising ocean levels. After the trip, the students used unique tools from the School of Creative Media to interpret and present their discoveries in new forms and displayed this at the April exhibition with the aim of enhancing public awareness about conservation.

The SKLMP was very honoured to participate in the Extreme Environments Program. While keeping safety as a priority, eight students from the dive team received SCUBA diving training by scientific and technical diving advisers, beginning from December 2016. As part of their training, these students attended classes and attained varying levels of diving certification, in order to dive, observe, and investigate the coral reef's biology ecology, and environment for the project themselves.

極地計劃——珊瑚大三角探索之旅

極地計劃是香港城市大學根據［重探索求創新課程］而設立的，希望能夠為學生極地探索提供學習環境和機會。2012 年曾到美國莫哈韋沙漠考察、2013 年到南極以及 2015 年到越南圖蘭洞穴群。

2017 年二月，來自香港城市大學創意媒體學院的 23 名學生與海洋污染國家重點實驗室 5 名科學研究員兵分兩路進行珊瑚大三角探索之旅。水路為【潛水組】，研究馬來西亞西巴丹島及麻布島的珊瑚礁；陸路則為【海島組】，考察所羅門群島西部亞納逢群島，因海平面上升而備受威脅的文化及生態系統。旅程完成後，參加水陸兩路的學生們使用創意媒體學院特定的工具，把從生態系統收集回來的數據轉化為新媒體作品，并在 4 月的展覽中展出，以提高公眾保育意識。

海洋污染國家重點實驗室很榮幸可以參與這次極地計劃，為了確保安全，自 2016 年 12 月起就安排【潛水組】的八名學生修讀相關課程，接受科技潛水顧問的多次深潛訓練，協助他們考獲潛水證書，為學生可以親身潛進海底，觀察和瞭解海洋生物和珊瑚礁生態環境作準備。

The SKLMP's Associate Director Dr Leo Lai Chan along with another four scientific researchers personally led the eight students to the sea floor, visiting different dive sites including Sipidan, one of the highest-rated underwater sites in the world. Students observed SKLMP scientific research in addition to exploring caves, coral reefs and wrecks. They swam alongside a broad diversity of aquatic life including sharks, turtles, moray eels and a plethora of fish species, and completed the trip objectives successfully.

Dr Leo Lai Chan said that CityU's students' voyage of discovery to the Coral Triangle was one of the most incredible discovery-based student explorations that he had ever witnessed. During this expedition, the students from the School of Creative Media dove into the delicate coral reef ecosystems and witnessed the fragility and serious threat facing the ecosystems. He also said that the SKLMP's underwater research team would assist the Asia Pacific Regions in developing a scientific diving program and promote marine environmental protection and conservation. They hoped to nurture younger marine citizen scientists through interdisciplinary teaching and new interactive learning experiences such as diving expeditions, field trips, and underwater marine biology classes.

在這次極地旅程中，海洋污染國家重點實驗室副主任陳荔博士以及其餘 4 名科學研究員親身帶領八名學生潛進海底，探訪不同的潛水地點，包括擁有世界罕見水底美景的西巴丹島。學生除了可以從旁觀察研究員如何在海底進行科學研究和採樣外，也跟隨研究員一起探索海洞、珊瑚礁和沉船遺骸，接觸各色海洋生物包括鯊魚、海龜、海鰻等，順利地完成了這次極地之旅的任務。

海洋污染國家重點實驗室副主任陳荔博士表示這次探索之旅是他至今見到最奇妙，觸動人心的學生歷險活動，可以讓學生通過潛水有機會直接觀察珊瑚礁生態系統，親眼目睹其脆弱性和所面臨的嚴重威脅。同時陳荔博士表示海洋污染國家重點實驗室水下研究團隊將繼續致力協助亞太地區發展科學潛水課程及促進海洋環境保護，希望將來發展更多跨學科教學與新穎的互動學習經歷，例如潛水、野外實地考察和水下海洋生物學課程培育更多的海洋公民科學家。

The Refresher Training Programme was jointly held by the SKLMP and Agriculture, Fisheries and Conservation Department's Diving Team, which included a seminar on diving safety and field training.

The seminar was held on 24 May, 2017 in Yeung Kin Man Academic Building, City University of Hong Kong. Dr Leo Lai CHAN, Associate Director of the SKLMP, was invited to share topics on scientific diving and present on its challenges, opportunities and discoveries. Ms Bibian Pui Yee WONG, Scientific Technology Diving Director in the SKLMP, was invited to make the detailed report about safety management system, revision of diving safety concepts and practices, basic gear maintenance, etc.

On 6 June 2017, the field training was held in the Sai Kung area as scheduled. The participants undertook whole day diving training from professionals of the SKLMP.

The participants agreed that the course strengthened their awareness of diving safety and enhanced their capacity in conducting underwater studies.

開放水域科學潛水及安全培訓課程是由海洋污染國家重點實驗室與香港漁農自然護理署潛水團隊聯合舉辦的，課程包括了兩個部分：科學安全潛水講座以及戶外潛水訓練。

2017 年 5 月 24 日，科學安全潛水研討會于香港城市大學楊建文學術樓舉辦。海洋污染國家重點實驗室副主任陳荔博士出席了會議，并就科學潛水，包括潛水面臨的挑戰，機會以及科學發現等作了報告。海洋污染國家重點實驗室科學潛水主任黃佩儀小姐則就潛水安全管理系統，潛水安全概念和應用的改變，裝備的基本維修等方面作了詳細的報告。

2017 年 6 月 9 日，潛水野外訓練如期在香港西貢舉行，參與者在 SKLMP 的專業研究員的指導下進行了為期一天的潛水訓練。

參加者均表示課程加強了其安全潛水的意識以及提高水下研究採樣的能力。

Refresher Training Programme
開放水域科學潛水及安全培訓

From 18 to 20 September, 2017, Dr Leo Lai Chan and Dr Jiajun Wu were invited to visit the First Marine National Bureau of Oceanography Institute in Qingdao, Qingdao Marine Technology Co. Ltd, and the Ocean University of China. During this period, Dr Leo Lai Chan gave a detailed report about the research work of science diving and marine science for the major freshmen in Environmental Science and Engineering at the Ocean University of China.

2017 年 9 月 18 日至 20 日，陳荔博士和吳佳俊博士受邀參觀青島國家海洋局第一海洋研究所，青島羅博飛海洋技術有限公司以及中國海洋大學。期間陳荔博士為海大環境科學與工程專業新生就科學潛水與海洋科學研究工作作了詳細的報告。

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