Innate immunity, developmental speed and their trade-offs in two hexapod models

Cheng, S.

Curriculum Vitae

Shixiong Cheng (Chinese: 程世雄) was born in Gangu, Gansu province, China on April 12th, 1993. After graduating from high school in Gangu county, he studied aquaculture at Dalian Ocean University in Dalian, Liaoning for his bachelor and master studies from 2011 to 2018. In June 2015, he gained his bachelor degree of Science in Agriculture. He then joined in the Key Laboratory of Mariculture & Stock Enhancement in North China's Sea, Ministry of Agriculture, under the supervision of Prof. dr. Y. Chang. He continued to study aquaculture until June 2018 at the same university, with a thesis focusing on the cloning, expression analysis and functional characterization of a thioredoxin-like protein gene from sea cucumber *Apostichopus japonicas*. This thesis had been selected as 2018 excellent thesis of master graduates in Liaoning Province in May 2019.

In December 2018, Shixiong was awarded the Chinese Government Scholarship to pursue his PhD research for a period of 4 years at the Institute of Biology, Leiden University, the Netherlands. The PhD project focused on innate immunity, developmental speed and their trade-offs in two hexapod models, under the supervision of Dr. M. van der Zee and Prof. dr. H. P. Spaink. Shixiong spent most of his PhD time to study the genetic basis of embryonic developmental speed in artificial selection lines of the beetle *Tribolium castaneum*, a.o. by applying CRISPR-Cas9 technology. In December 2022, he was also funded by the Institute of Biology, Leiden University for a period of 6 months to finish the work. In August 2023, this work has been orally presented at the International Conference on Insect Science (ICIS2023) in Baoding, China, which was rewarded with the best PhD student presentation prize. The results of his work at Leiden University are presented in this thesis.

List of publications

Cheng S, Jacobs CGC, Mogollón Pérez E, Chen D, van de Sanden J, Bretscher K, Verweij F, Bosman J, Hackmann A, Merks R, van den Heuvel J, and van der Zee M. A life-history allele of large effect shortens developmental time in a wild insect population. Nature Ecology & Evolution, accepted for publication with minor revision.

Wang M., Rücklin M., Poelmann R. E., de Mooij C. L., Fokkema M., Lamers G. E., de Bakker M. A., Chin E., Bakos L. J., Marone F., Wisse B. J., de Ruiter M. C., **Cheng S**, Nurhidayat L, Vijver M. G., and Richardson M. K. Nanoplastics causes extensive congenital malformations during embryonic development by passively targeting neural crest cells. Environment International. 2023 Mar 6:107865.

Wang Y[*], **Cheng S**[*], Chang Y, Li K, Chen Y, Wang Y. Identification and expression analysis of a TLR11 family gene in the sea urchin *Strongylocentrotus intermedius*. Immunogenetics. 2018 May;70(5):337-46. ([*] **co-first authors**)

Cheng S, Chen Y, Chang Y, Li K, Zhang X, Shang S, Li G, Li L. Cloning and expression analysis of a stomatin gene from the sea cucumber *Apostichopus japonicas*. Invertebrate Survival Journal. 2017 Oct 25;14(1):414-22.

Cheng S, Chang Y, Wang Y, Li G, Chen Y, Ning J, Li K. Molecular cloning and functional characterization of a calreticulin gene from the sea cucumber *Apostichopus japonicus*. Invertebrate Survival Journal. 2017 Sep 18;14(1):363-74.

Cheng S, Li C, Wang Y, Yang L, Chang Y. Characterization and expression analysis of a thioredoxin-like protein gene in the sea cucumber *Apostichopus japonicus*. Fish & Shellfish Immunology. 2016 Nov 1;58:165-73.