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Editorial

RNAS$^+$: A win–win collaboration to combat neglected tropical diseases in Southeast Asia

The 'Regional Network for Asian Schistosomiasis and Other Zoonotic Helminthiases' – RNAS$^+$ in short – has existed for 10 years. Today, more than 90% of all research institutions and control authorities in Southeast Asia working on the target diseases of the network are represented [1,2]. The UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) launched the network concept in 1998 during a meeting in Wuxi, Jiangsu province, People's Republic of China. The initial focus was on schistosomiasis and the six Asian member countries were Cambodia, Indonesia, Japan, Lao People's Democratic Republic, People's Republic of China and The Philippines. Subsequently, the network has grown in importance to become a force in multidisciplinary research and multisectoral collaboration among Asian professionals, scientists and public health experts. From its original exclusive focus on schistosomiasis, the network has now expanded to deal with the region's most important zoonotic helminth infections, including cysticercosis/taeniasis [3] and food-borne trematode infections (e.g. clonorchiasis, fascioliasis, opisthorchiasis and paragonimiasis) [4]. Meanwhile, another three countries have joined RNAS$^+$, namely South Korea, Thailand and Viet Nam. Whilst the diseases targeted for research and control by RNAS$^+$ have been neglected for too long, there is now real hope for a lasting change. Thanks to a growing awareness of public health issues, the economic impact of these diseases, and a budding political and financial commitment to make a dent against the neglected tropical diseases a new order is appearing [5]. For example, in the late 1990s, Japan launched the so-called Hashimoto Initiative, the first global programme to target parasitic diseases. By means of integrated development programmes, this initiative aims at improving health and alleviating poverty, and hence contributing to the United Nations' Millennium Development Goals (MDGs) [6–8]. Most recently, a new US$ 350 million global initiative to fight neglected tropical diseases has been announced by George W. Bush, President of the United States (US), in February 2008.

The RNAS$^+$ latest annual meeting, held in Lijiang, Yunnan province, People's Republic of China, between 4 and 7 September 2007, convened 120 scientists and disease control managers. This is the largest meeting of the network so far, and hence emphasizes the increasingly important role of RNAS$^+$ in strengthening the regional cooperation and exchange of information on the epidemiology and control of the neglected tropical diseases in Southeast Asia. The importance of the meeting is further underscored by the decision of the editors of *Parasitology International* to put forward a special section of the journal, publishing selected presentations that took place at this 7th RNAS$^+$ workshop.

RNAS$^+$ holds annual meetings and the impact of the network is witnessed by increased communication, satellite workshops or training courses, and a growing number of collaborative research projects at national and regional scale among Asian member countries and their international partner institutions in Australia, Denmark, Sweden, Switzerland and elsewhere [9]. The 5th RNAS workshop, held in Bali, Indonesia in August 2005, resulted in the creation of a formal organization of the network, an encouraging evaluation of its achievements, further training (emphasis on ethics in epidemiological research), mapping of the distribution of the target diseases using remote sensing and geographical information system (GIS) tools and evidence-based health advocacy. Most significantly, both the scope (including relevant helminth zoonoses other than schistosomiasis, i.e. clonorchiasis, cysticercosis, fascioliasis, opisthochiasis, etc.) and the new geographical representation of the network (now including South Korea, Thailand and Viet Nam) have expanded to operate on a higher level justifying the change of logo from RNAS to RNAS$^+$. This expansion was agreed upon in order to address schistosomiasis control as part of a more integrated approach to control neglected tropical diseases [10]. The communication between scientists and institutions relevant to the region's prevailing zoonotic helminth infections has been facilitated by an enhanced, updated and interactive RNAS$^+$ web page (http://www.rnas.org.cn).

Participants from all member countries and the international partner organizations such as the World Health Organization (WHO) and the WHO Regional Office of the Western Pacific (WPRO), as well as scientists from research institutions in Australia, Denmark, Switzerland, United Kingdom and the US participated in the 7th RNAS$^+$ annual meeting. Delegates from each member country gave updates of the current status of research on each target disease, general scientific progress made, and new collaborative initiatives related to research and control measures. A one and a half day workshop on 'Burden Assessment of Important Helminth Zoonoses', jointly organized by Professor Charles H. King at the Center for Global Health and Diseases at Case Western Reserve University School of Medicine in the US, and Dr. Hélène Carabin at the Department of Biostatistics and Epidemiology at the University of Oklahoma Health Sciences Center in the US (joining the teaching via an advanced video conferencing link), was integrated with the conference. The purpose of this workshop was to realize that the global burden of helminthic diseases is considerably underestimated, and hence emphasizing the need to provide new tools and approaches on how to address the importance of RNAS$^+$ target diseases, including determining the economic and societal benefits of prevention and control activities [11,12].

Parasitology International decided to produce this special section in order to illuminate the strong pace of research and to provide updated information on the epidemiology of the important zoonotic helminthiases under study. The six selected presentations from the 7th RNAS$^+$ annual meeting and workshop published here, not only assist and

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deepen our understanding of the current epidemiological status, but also illustrate the difficulties in the various approaches to control the target diseases [13]. The current status of research and control of schistosomiasis and the other targeted helminth-related diseases in the region were illustrated by Leonardo and colleagues [14] and Conlan and others [15]. The former paper is an important contribution to the understanding of the epidemiology of schistosomiasis japonica in The Philippines and can be used as a guide for the implementation and monitoring of control interventions. Importantly, and perhaps counter-intuitively, the authors point out that the prevalence of *Schistosoma japonicum* in the areas under study (Mindanao and the Visayas) remains consistently high among adults in comparison with the younger generations. At the same time, the paper gives a useful account on how a survey of schistosomiasis can be readily integrated with the fight against other helminth infections, since eggs of *S. japonicum*, soil-transmitted helminths, *Echinostoma* spp. and other intestinal parasites can be diagnosed simultaneously in stool samples. Conlan et al. [15] reviewed current research on taeniasis and cysticercosis in Lao People's Democratic Republic. Their paper illuminates the constraints that continue to hamper progress in this field; indeed only nine surveys of human helminth infection have been conducted over the past 20 years with the prevalence of taeniasis ranging from nil to 14.0%. The presentation by this research group makes it clear that considerably more research and surveillance activities are required in Lao People's Democratic Republic (and elsewhere) to further our understanding of, and sustained control against, taeniasis and cysticercosis.

The impact of environmental factors on disease transmission was demonstrated by the ecological investigations put forward by Attwood and colleagues [16] and Wu et al. [17]. The former paper provides a refreshing insight into the ecology of *S. mekongi* and how the past events have affected the present distribution of this type of schistosomiasis. The paper also suggests that there may exist biological features that allow intermediate host snails to sometimes inhabit places where they are not normally found; a finding which could have far-reaching implications in monitoring and surveillance, particularly in view of large-scale water resources developments underway in Lao People's Democratic Republic. Wu et al. [17] call for monitoring the dispersal of intermediate host snails of *S. japonicum* immediately after floods have occurred, and the establishment of regional intersectoral collaboration among the agricultural, health and hydrological sectors in the Yangtze River valley of the People's Republic of China, in order to block expansion and spread of the disease after flooding events. Thus, both papers call for strengthening of the surveillance of schistosomiasis in different parts of Southeast Asia. Once established, such surveillance platforms could be utilized for rigorous monitoring of the target diseases of RNAS$^+$ in connection with demographic and ecological transformations, control interventions, and changes due to socio-economic development in the region.

The inherent difficulties in control or surveillance, as well as relevant suggestions or recommendations were provided by the studies by Garjito et al. [18] and by Lin and collaborators [19]. The latter study resulted in some new references for the proper application of the Kato–Katz technique for diagnosis of *S. japonicum* and the rational evaluation of the epidemic situation, as well as provision of a scientific basis on which to build a mathematical model for predicting the 'true' prevalence of *S. japonicum* infection. After reviewing the historical control activities of schistosomiasis in Indonesia, Garjito et al. [18] call for multisectoral collaboration to eliminate schistosomiasis japonica in Indonesia. Many problems appeared after the disease was first discovered in the Napu and Lindu valleys, even though the disease continues to be limited to very small foci in these valleys. This is an interesting situation where active control, even when carried out for many years, is not sufficient to locally eliminate the disease. It shows the formidable difficulties we are up against in all schistosome-endemic settings. The challenge is to sustain active control when the threat has subsided and the local population becomes less inclined to continue collaboration with control programme staff in charge of surveillance.

It must be deemed useful to not only organize plenary and parallel sessions with oral presentations, but also to continue the open discussions in round-table fora on future activities of RNAS$^+$. This was done in the form of a workshop, where it was agreed that future activities of RNAS$^+$ should focus on preparing and delivering training packages and mutual cooperative research projects for enhancing the current surveillance systems in member countries. In order to achieve a more cost-effective reduction of morbidity and parasite transmission, a strategy was adopted by improving and standardizing diagnostic tools, and seeking integration of control programmes. After having attended the meeting and read the papers presented there, it is evident that a "win–win" collaboration mechanism has been initiated by means of multidisciplinary and multisectoral collaboration. This special section bears witness to the progress made and the goals achieved by RNAS$^+$ since its inception 10 years ago.

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Xiao-Nong Zhou
National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention, Shanghai 200025, People's Republic of China
Corresponding author. National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention, 207 Rui Jin Er Road, Shanghai 200025, People's Republic of China. Tel.: +86 21 6473 8058; fax: +86 21 6433 2670.
E-mail address: ipdzhouxn@sh163.net.

Nobuo Ohta
Section of Environmental Parasitology, Graduate School, Tokyo Medical and Dental University, 1-5-45 Yushima, Bunkyo-ku, Tokyo 113-8519, Japan

Jürg Utzinger
Department of Public Health and Epidemiology, Swiss Tropical Institute, P.O. Box, CH-4002 Basel, Switzerland

Robert Bergquist
Ingerod 407, Brastad, Sweden

Remigio M. Olveda
Research Institute for Tropical Medicine, Alabang, Muntinlupa City, Philippines