

# An overview on history of laboratory animal science in Asian countries

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## Abstract

The time points of development of laboratory animal-based research and establishment of societies/associations for laboratory animal science differ in the Asian part of the world. Some of the Asian countries do not have their own associations and they are in the process of establishing them. In this context, we conceptualized the idea through this article to provide an overview on initiation of laboratory animal-based research and establishment of associations or societies in several different Asian countries.

**Key words:** History, LAS, associations/societies, Asia

## Introduction

Countries of ancient Asia had a historically rich heritage with their own educational systems, cultures and customs. Most of the Asian countries were subjected to colonial rule, and following that Western cultures were introduced to these countries gradually.

Not only the Western culture, under the influence of European ruling, establishment of educational institutions and introduction of methods and models of education similar to Western models began in Asia. With the initiative of animal use in ancient Europe for understanding human anatomy and physiology and subsequently for research and testing, it may have slowly propagated to the Asian region following the era of Western colonization. It is not clear and questionable as to who was responsible for introducing animal-based education in science and medicine, and animal-based research and testing in individual countries in the Asian region and the exact time period of this introduction. Many of the Asians are Buddhists. European colonization and Islamic traders introduced other religions to Asian countries.

Information found/obtained from websites and publications are indicated below to support how laboratory animal science was established in Asia. However, this is not a complete account of the information from historical point of view representing all countries of Asia due to lack of information.

### *Japan*

The developed countries in the Asian region have more resources for laboratory animal-based research and testing. Establishment of the first Institute for Laboratory Animal Research in Japan was taken place in 1956 following that several universities and private companies developed facilities for animal experiments. Before the establishment of the first institute, work related to development of inbred strains for Japanese mice was begun in 1944 by Kondo and Masui (Yoshio, 1984) (Tables containing required information in this article were translated into English by Emeritus Professor Noriyuki Kasai, Secretary General of Asian Federation for Laboratory Animal Science Associations on the request of the authors). The development trends in laboratory animal science when compared to economic development trends indicate that Japan followed more or less the same pattern of percentage

development (% development) in the field beginning from 1940 to 2010 compared to development in USA and UK; however, % development in Japan (about 70%) was less than that of USA (>80%) and UK (70-80%) (Kong and Qin, 2010). Further, the paper authored by Tateki KIKUCHI *et al.*, provides evidence for existence of animal models to conduct research related to human muscular and nervous diseases since 1960s in Japan (Tateki *et al.*, 1987). The concept of microbiological monitoring was established in Japan around 1980s and since then the ICLAS monitoring Center at the Central Institute for Experimental Animals, Japan as a testing laboratory has been performing microbiologic and genetic monitoring of laboratory animals. This monitoring supported elimination of fatal pathogens such as Sendai virus and mouse hepatitis virus in laboratory animal facilities in Japan (Hayashimoto, 2015).

### China

On the other hand, China has a very long history related to animal use. In 21<sup>st</sup> Century B.C. the use of Chinese traditional medicine and herbal remedies were founded with the aid of animal tests. Also, animals had been used to check toxicants in 6<sup>th</sup> Century B.C. Mouse as the first laboratory animal and Chinese hamster were used for experimentation in China in 1918 and 1919, respectively. There was introduction of new animal models such as Swiss mouse from Haffkine Institute, India and Golden hamster from USA for experimentation in 1944 and 1948. In 1980, nude mice and aseptic mice were first bred in China for experimental purposes. However, from 1940 to 1980 the development trend of LAS in China was <10%, with a rapid increase acquiring 60-70% by 2010. Questionnaire based survey conducted in China in 2006 indicated >100,000 people worked in the field of laboratory animal science attached to 2,000 institutions. Approximately 16 million laboratory animals out of about 19 million animals were used in animal experiments in 1530 facilities licensed for their use. Mouse was the most popular animal model used in research while hamsters and rats were in the second and third levels. In addition to these 3 models guinea-pigs, rabbits, dogs, cats, monkeys and birds were also used in experiments during the period from 1983 to 2006 (Tateki *et al.*, 1987). Currently there are 300,000 practitioners in the laboratory animal science field with more than 30 kinds of animal species and more than 2000 strains in China (Gao, 2016).. Guideline on the Humane Treatment of Laboratory Animals was issued in 2006, which is widely regarded as the Chinese Guide for the Care and Use of Laboratory Animals (Kong and Qin, 2010).

### India

The earliest history of animal experimentation in India could be traced back to the 19<sup>th</sup> century. It began with the British scientists when attempted to introduce chemical drugs in colonial India. The Indian Snake Venom Commission was introduced in 1872 to verify the length of time those bitten by snakes could be kept alive by artificial respiration. Thereafter, the first Hyderabad Chloroform Commission was constituted in 1988 to assess the effect of Chloroform as an anaesthetic agent on animals (Ramachandra, 2014).

In India, the initial foundation of humane and ethical use of animals in research was made by the Prevention of Cruelty to Animals Act of 1960. Indian National Science Academy (INSA) had published a “Guidelines for Care and Use of Animals in Scientific Research” in 1992. Subsequently, INSA constituted a committee under the Chairmanship of Dr. P.N Tandon to revise these guidelines. These revised guidelines were published in the year 2000. These two guidelines formed the basis for adopting and functioning by most of the Animal Facilities in India. Ministry of Agriculture constituted the CPCSEA in 1968. In the year 1998, the rules were re-notified in the Gazette of India as a “Breeding of and Experiment on Animals (Control and Supervision) Rules, 1998” (Ingle, 2015). Currently there are more than 1790 CPCSEA registered Animal Facilities in the country conducting research on animals (<http://cpcsea.nic.in/WRITEREADDATA/CMS/New%20Institution%20List2021.pdf>).

National Centre for Laboratory Animal Sciences (NCLAS) was established in India in 1957, for spreading knowledge on the care, breeding, management and experimentation using laboratory animals in biomedical research in the country. It was started as an unit called ‘Laboratory Animal Information Service’ (LAIS) at the Indian Cancer Research Centre, Bombay (now called Advanced Centre for Treatment, Research and Education in Cancer which has the established Animal Facility since its inception in 1952 <https://actrec.gov.in/cri-research-support-facility-detail/70>) way back in 1957 with the help of UNESCO and became a unit of Indian Council of Medical Research (ICMR), New Delhi in 1959. This unit for the first time undertook a survey on the conditions of laboratory animal care, breeding and experimentation in the country and felt the need for educating the biomedical fraternity on the proper care, breeding and maintenance of laboratory animals. This resulted in the initiation of a regular training course in laboratory animal sciences way back in 1967 (<http://www.narfbr.org/index.php/the-star>).

It is a requirement by Law in India that every organization who plans to conduct animal experiments should register with the Committee for the Purpose of Control and Supervision of Experiments on Animals and prior approval is mandatory for all animal experimentation by the Institutional Animal Ethics Committee (Mandal and Parija, 2013; Krishna, 2015).

Laboratory Animal Scientists’ Association (LASA) India was established in 2004 with the aim to promote and coordinate the development of laboratory animal science throughout the country, to collect and disseminate information on laboratory animals, to promote humane use of animals in research, and to promote 3R principles of Russell and Burch. Currently there are 770 members of this association who are veterinarians, clinicians, researchers, technologists, pharmacologist, and other professional related and interested in laboratory animal science and welfare. LASA India organizes conferences and workshops regularly. LASA was fortunate to organize the 8<sup>th</sup> AFLAS Congress in India in the year 2018 (<http://lasaindia.in/index.php>).

## *Singapore*

Laboratory Animal Science has emerged in Singapore around 1980s. A set of guidelines were developed and formalized in 2004 with National Advisory Committee for laboratory research emphasizing the need for quality training. The course on Responsible Care and use of laboratory animals conducted by the National University of Singapore, Biological Resource Centre and SingHealth Experimental Medicine Centre provides quality training to all users of animals for scientific purposes in Singapore (Quan, 2015).

## *Sri Lanka*

History of laboratory animal use in medical education in Sri Lanka dates back to early 1950s according to preserved information available at the Department of Physiology, Faculty of Medicine, Colombo. Experiments such as frog and rabbit cardiac muscle action potentials and changes in the presence of different ions etc. had been demonstrated by the Physiologist Dr H D W Jansz in 1951 and 1952 (Gunatilake, 2018). The 'First Animal House' in the country for teaching and experimental purposes has been established at the Faculty of Medicine, University of Colombo (UCFM) in 1969. As per the earliest available evidence, Late Professor K N Seneviratne, a neurophysiologist (1969-1981) had worked with healthy and alloxan induced diabetic rats (Seneviratne and Peiris, 1969; Seneviratne, 1972; Seneviratne and Weerasuriya, 1974). In addition to Animal House of UCFM, Animal Centre of Medical Research Institute which was established in 1990 contributes to the LAS field by maintaining different animal models for research purposes. It also maintains sheep and goose for blood samples required for media preparation in microbiological investigations and for various other diagnostic purposes (<http://www.mri.gov.lk/departments/animal-centre/>).

## *Thailand, Malaysia, Korea and Taiwan*

Although laboratory animal-based research had been carried out in Thailand for nearly a century, the beginning of laboratory animal science was unknown. Rodents as laboratory animals for biomedical research had been introduced at medical schools in 1960s (Gettayacamin *et al*, 2018a).

The use of laboratory animals in the Institute of Medical Research, Malaysia could be traced back to as early as 1940's where these animals were used for diagnosis as well as research of diseases such as yellow fever, scrub typhus and rabies ([www.imr.gov.my](http://www.imr.gov.my)).

From about mid-1980s, experimental animal sciences were introduced in Korea ([www.kalas.or.kr](http://www.kalas.or.kr)). Although it was late compared to several other countries in Asia to introduce laboratory animal-based research and testing, they have many developments in the scientific field with their economic and technological advancement.

Taiwan has over 200 institutes (universities, industries, research institutes etc.) where vertebrate animals are used for scientific purposes. Size of the laboratory animal facilities and the number of laboratory animals used among the stated institutions vary significantly (Kurosawa *et al*, 2018; [www.animal.coa.gov.tw](http://www.animal.coa.gov.tw)). Information related to origin of laboratory animal science could not be found.

## *Vietnam, Mongolia and Philippines*

Vietnam, although has a very long history of using laboratory animals for research and development of biomedical products, the attention paid for the LAS field before 2010 has been very minimal. Efforts taken towards the inclusion of lab animal subject in university curricula was an important achievement. As per the information divulged in 2016 at the 7<sup>th</sup> AFLAS conference plans had been initiated to establish an Association for Laboratory Animal Science in Vietnam (Nguyen, 2016).

There had been an era in Mongolia where a nationwide system of standardized research institutes with animal facilities was developed properly under Soviet administration from early 1920s until 1990s democracy revolution. Description of the procedures ensuring humane treatment of animals and humane methods of euthanasia were unknown until very recent times. It is stated in 2016 that they are organizing an Association for Laboratory Animal Science of Mongolia (Batchimeg, 2016). Whether the mission of Vietnam and Mongolia in establishing associations for the discipline is achieved or not could not be ascertained.

Philippines had started laboratory animal-based research to study about smallpox as early as 18<sup>th</sup> century (Gettayacamin *et al*, 2018b).

During different time periods, Asian countries have developed and accepted the Laws/Acts and guidelines on the use of animals in research. The extent of close monitoring of animal-based experiments taking place in these countries is not very clear. Laboratory Animal Science Associations or Societies have been established in the several member countries with the aim of promoting laboratory animal science with ethical use of animals. Brief account of these associations is given in Table 1.

A mother organization namely Asian Federation of Laboratory Animal Science Associations (AFLAS) was established in 2003 with representatives from six associations or societies; Japan, China, Chinese-Taipei, Korea, Thailand and Taiwan. Subsequently Singapore, Malaysia, India, Sri Lanka, Philippines and Indonesia have become members of AFLAS. Sri Lanka is the youngest member of the AFLAS totaling to 11 member associations as of now ([www.aflas-office.org](http://www.aflas-office.org)).

**Table 1: Year of establishment of LAS Associations/Societies in the respective countries**

Year	LAS Associations/Societies established in member countries
1951	The Experimental Animals Research Committee (EARC) as the oldest organization representing LAS in Japan (Yoshio, 1984). Also, in Asia.
1957	EARC was upgraded as the Japanese Society for laboratory animals (Yoshio, 1984)
1980	The Japanese Association for Laboratory Animal Science (JALAS) (Yoshio, 1984)
1985	The Korean Association for Laboratory Animal Science (KALAS) ( <a href="http://www.kalas.or.kr">www.kalas.or.kr</a> )
1987	Chinese Association for Laboratory Animal Sciences (CALAS) was established (Kong and Qin, 2010)
Information could not be found	The Chinese-Taipei Society for Laboratory Animal Science (CSLAS) (Getayacamin <i>et al</i> , 2018b) Establishment may be before 2001 as this society had represented the symposium entitled “Laboratory Animal Science in Asian Countries –Present and Future” in the Congress held at Yokohama, Japan on May 9, 2001 ( <a href="http://www.aflas-office.org">www.aflas-office.org</a> )
1994	Laboratory Animal Science Association of Malaysia (LASAM) ( <a href="http://www.lasam.org.my">www.lasam.org.my</a> )
1998	Philippine Association for Laboratory Animal Science (PALAS) ( <a href="http://www.palas-ph.org">www.palas-ph.org</a> )
2001	Thai Association for Laboratory Animal Science (TALAS) ( <a href="http://www.taiasthailand.org">www.taiasthailand.org</a> )
2004	Laboratory Animal Scientists’ Association (LASA) India ( <a href="http://lasaindia.in/index.php">http://lasaindia.in/index.php</a> )
2004	Singapore Association for Laboratory Animal Science (SALAS) ( <a href="http://www.salas.com.sg">www.salas.com.sg</a> )
2012	Sri Lanka Association for Laboratory Animal Science (SLALAS) (Gunatilake, 2918)
2012	Indonesian Association for Laboratory Animal Science (IALAS) ( <a href="http://www.ialas.id">www.ialas.id</a> )

## CONFLICTS OF INTEREST

None

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