

A Framework for Harmonization of Toxicology Accreditation Boards and Registries

September 8, 2000

INTRODUCTION

Toxicology is a diverse science requiring expertise in a number of biological and medical disciplines. It is desirable that toxicologists working in the fields of toxicology should have expert knowledge of various aspects of the subject in order to make decisions on chemical safety. The desire to have recognition of this expertise has catalyzed the formation of various certifying boards and registries of toxicologists within the USA, Europe, and Asia. In 1992 at the IUTOX Congress in Rome, IUTOX began exploring the possible international harmonization of certification and registration of toxicologists. In 1996, EUROTOX (the Association of European Toxicologists and European Societies of Toxicology) established their Registry of toxicologists thereby forming the first international registry for toxicologists. During the 8th International Congress in Paris in 1998, IUTOX sponsored a workshop on international accreditation to further consider harmonization. In 1999, the American Board of Toxicology held an informal meeting during the Society of Toxicology meeting in New Orleans to further explore harmonization possibilities and stimulate the process. Based on the current interest of so many boards and registries, the Executive Committee of IUTOX (IUTOX-EC) decided to assist the process and coordinate effort to achieve harmonization of certification/registration of toxicologists. In 1999, IUTOX-EC recommended formation of an Ad Hoc committee (hereafter referred to as committee) to develop a plan for harmonization. The committee will develop and lead the coordinated effort to achieve harmonization for certification/registration of toxicologists. The following plan was established for this committee:

- The committee will be composed of representatives of existing accrediting organizations and bodies worldwide.
- The committee will assess the certification/registration requirements of the existing accrediting organizations and bodies worldwide.
- The committee will establish a procedure for harmonizing international certification/registration of toxicologists.

Dr. Glenn Sipes, President of IUTOX, asked the following individuals to serve on this committee or as observers and to represent their boards and registries:

Dr. James Bus (IUTOX, USA)
Dr. Tetsuo Satoh (IUTOX, Japan)
Dr. Arthur Craigmill (ABT, USA)
Dr. Richard Morrissey (ABT, USA)
Dr. Robert Snyder (ACT, USA)
Dr. Frank Galey (ABVT, USA)
Dr. Leander Tryphonas (STP, USA)
Dr. John Fowler (EUROTOX, UK)
Dr. Edmond E. Creppy (EUROTOX, France)
Dr. M. Manno (EUROTOX,)
Dr. Ikuo Horii (JST, Japan)
Dr. Il Je Yu (KST, Korea)

The mission of the committee is to establish a strategic plan including long range goals and specific objectives to be accomplished by 2001. The committee will coordinate discussion on this topic and consider options available which will encompass the current practices and standards of the current boards and registries. The committee will produce a report which will be sent to the IUTOX-EC for presentation at the 9th International Congress of Toxicology (ICT-IX) in Brisbane, Australia in July, 2001.

PROPOSED LONG RANGE GOALS

The Ad Hoc committee will discuss the long range goals and specific objectives to establish the harmonization of certification/registration procedures for qualified toxicologists. A number of specific objectives should be seriously considered by the committee to make a final report. Since the time for discussion is extremely limited, the committee will hold the meetings 2-3 times in the year 2000 and e-mail conference will be effectively arranged. The committee will send the draft report of the suggestions to IUTOX-EC in August 2000, and the final report will be sent to IUTOX-EC by January 2001.

Specific Objectives and Options:

1. **What is the goal?** The goal of this effort is to harmonize the requirements for certification/registration as a professional toxicologist internationally. The aim may not be to create an international board, but that is an option.
 - a. Harmonization of procedures
 - b. Harmonization of standards
 - c. Creation of an international certification
 - d. Creation of an international Registry
 - e. Mutual recognition

2. **What elements need to be demonstrated to be an expert?** The key here will be flexibility in achieving recognition as a professional toxicologist.
 - a. Training
 - b. Experience
 - c. Expertise
 - d. Active Practice

3. **How may these elements be demonstrated effectively?**
 - a. Publications
 - b. Reports
 - c. Awards

4. **Similar aspects of all the systems:**
 - a. Training requirement (BS, MS, MD, D.V.M., Ph.D.)
 - b. Experience requirement, active practice of toxicology
 - c. Presence of theoretical and practical components of toxicology in training and practice
 - d. Objective expert evaluation of qualifications
 - e. Test (not all systems)

5. **How do we proceed to adopt these as “recognized” by all parties?**
 - a. Intra-organizational procedures
 - b. Inter-organizational procedures

6. **Criteria for a satisfactory registration Scheme (EUROTOX model)**
 - a. National level, one scheme per country
 - b. Definition of syllabus for a toxicologist both general and within the context of local/national needs
 - c. Objective review process for applications, with or without examination
 - d. Impartial and authoritative review process

7. **Potential Hurdles to this Process**
 - a. Multiple boards within the US
 - b. Grandfathering criteria for boards which have grandfathered in candidates. This may be a problem for those boards which require a test (ABT, ABVT) and did not grandfather anyone.
 - c. Expense of the process. Who will pay for it?

Other considerations:

The aim may not be NOT equivalency, but must include mutual recognition of the acceptability of different approaches to certification and registration.

In addition, the aim is NOT to rank different schemes as being better or worse, but their acceptability to all parties.

Dr. Sipes stated recently that developing countries are not particularly interested in certification at this time, they are more in need of training. We should leave our efforts open to help developing countries initiate certification procedures by providing a framework if and when they so desire, and to also help them with obtaining the training they need. This could also include a phased approach to developing such expertise and certification procedures.

Why is this important? Recognition as having expertise in the area of toxicology, to separate the professionals out as distinct from others.

Advantages to the individual diplomates and registered toxicologists:

“Automatic” recognition.

Study director status.

Inter-board and intra-board issues:

Is Formal Reciprocity an aim? Is mutual recognition of expertise for each scheme certifies real toxicologists, the goal?

Do we form an IUTOX task force similar to the EUROTOX one with a registration officer?

How will the members of each board react to this idea and how does each board get approval to even do this? If possible, each representative should explore this and bring this information to the meeting so we can know this at the beginning.

International Board Option:

If the committee decides that an international accreditation is desirable, then the following issues must be addressed.

Since the current procedures for certification/registration of toxicologists in the ABT, EUROTOX, JST and others are completely different from each other, those differences should be harmonized to make a single certification/registration. As the generally recognized problem, there is a big discrepancy of the necessity of international certification/registration between toxicologists in developed countries and those in developing countries.

- 1) Possibility of harmonization of the certification/registration procedure for examination/registration between the existing accrediting organizations and toxicology societies in developing countries.
 - a. To survey the interests of toxicologists in developing countries in the international certification/registration program.
 - b. To foster the toxicologists in developing countries for qualification of international certification/registration program by education and training sponsored by IUTOX.
- 2) Procedures for qualification of international certification/registration of toxicologists who are certified by the individual organizations.
 - a. To certify the international accreditation by international common examination of fundamental knowledge of toxicology.
 - b. To approve the qualification by only registration without any international examination for those who are certified by existing organizations
- 3) Qualification of the applicants for international accreditation.
 - a. Those who are desirous of receiving an international certification/registration for qualified toxicologists are required to have a certification of the individual existing organization.
 - b. Those who are desirous of receiving a license of qualified toxicologist are obliged to pass the international common examination.
- 4) Procedure for recertification of authorized qualification.
 - a. Every five years after the certification/registration is granted, certified toxicologists shall have to make a recertification of their qualification by examination.
 - b. Every five years after the certification/registration is granted, certified toxicologists shall have to make a recertification of their qualification only by registration, no specific examination
- 5) Payment of the fee for examination of the individual organization and registration for international certification/registration by registration (examination).
 - a. Applicants shall pay the registration fee to only their organization.
 - b. Applicants shall pay the registration fee to only the international organization.
 - c. Applicants shall pay the registration fee to both organizations.
 - d. The individual organizations shall pay the registration fees of the applicants through the finance of the organizations to the international body.

- 6) Establishment of the international organization for certification/registration of toxicologists.
 - a. The new international organization which is independent of IUTOX shall be established to achieve the secretarial business of certification/registration smoothly.
 - b. IUTOX shall be responsible for the secretarial business of certification/registration.

Table of Boards and Registries

See the file named: iutox harmon 2000.pdf

Appendix I. EUROTOX REGISTRATION INFORMATION

EUROTOX NEWSLETTER, Volume 21, No. 2, June 1998

TOXICOLOGISTS REGISTER: NATIONAL AND INTERNATIONAL PERSPECTIVES

John S.L. Fowler, EUROTOX Registration Officer

Paper presented at a Workshop of the Società Italiana di Tossicologia, Istituto Superiore di Sanità, Rome, December 3, 1997

Toxicology is a large topic and still somewhat ill defined; perhaps this is as it should be. In an increasingly bureaucratic world we must be careful not to close the door on the wide range of expertise and experts whose skills may be needed in regulatory science and research. Anyway, not all scientists who contribute to human and ecological safety are willing to be called or are interested in being referred to as 'a toxicologist'.

A national registration scheme is seen by adherents as insurance against an overnight call for accreditation. Registration, based on peer review of training records and other credentials by an autonomous body, certainly implies proper regulation and allocation of responsibility within that profession. At least two outcomes are claimed to be facilitated:

- registration allows recognition and acknowledgement of experts who currently practice within the field;
- registration provides aspiring toxicologists with a more clearly defined path to follow in order to gain recognition.

On an international basis, EUROTOX, with its 25 member societies, sets out to promote registration and harmonization of methods of registration in interested countries. This is achieved through a permanent task force of senior toxicologists and a nominated liaison person. Regular updates are presented in the EUROTOX Newsletter. On a global basis, Gerhard Zbinden organized a workshop on accreditation at IUTOX in Rome in 1992.

This contained position papers from European contributors, from Japan, USA and Australia. A further workshop is to be organized by Meryl Karol of the Commission on Education for IUTOX, and will be in the Paris meeting, July 5-11, in 1998. The EUROTOX liaison officer will present the European position on this occasion.

Summary of the present position of EUROTOX in respect to registration of toxicologists

INDIVIDUAL LEVEL

- advises regarding certification (EuroDipTox)
- provides a list of registered scientists (European Register)

NATIONAL LEVEL

- provides advice at the national level to Societies of Toxicology
- facilitates development of registration opportunities through National Registration Schemes
- issues certificates to toxicologists who are listed in participating National Schemes

INTERNATIONAL

- represents the European Schemes at IUTOX and similar level
- responds to calls for information at the supranational level

GENERAL

- provides details of the harmonized European requirements as needed
- advises individuals seeking registration
- advises individuals seeking continuing professional development and re-registration

Summary of the EUROTOX position, January 1998

Harmonized Scheme for Registration of Toxicologists within EUROTOX

- three founder schemes (Germany, Netherlands, UK) formed the basis of the harmonized 'EUROTOX model' (1994)
- schemes in Finland (1995) and Switzerland (1996) have contributed to the EUROTOX list
- schemes recently notified, or known to be under development, include France, Italy, Spain, Ireland and Norway

The EUROTOX Registered Toxicologist

- the term 'EUROTOX Registered Toxicologist' is established as a legal entity within Switzerland and on an international basis (1996)
- registered toxicologists of the three founder schemes (Germany, Netherlands, UK) are eligible for the title EUROTOX Registered Toxicologist
- recently admitted toxicologists of all the collaborating schemes are immediately eligible for the title EUROTOX Registered Toxicologist

The EUROPEAN REGISTER of Toxicologists

- EUROTOX collates the current national lists of toxicologists in participating countries
- EUROTOX can supply on demand, a list of 'EUROTOX Registered Toxicologists'

- the 'European Register of Toxicologists' contains individual's names and the name of the route by which their registration has been accepted
- a 'EUROTOX Registered Toxicologist' certificate is sent to individuals who are listed

Summary of EUROTOX requirements of a 'Eurotox Registered Toxicologist'

EUROPEAN REGISTER OF TOXICOLOGISTS:

CANDIDATES FOR FIRST REGISTRATION

Table 1. Typical theoretical training expected

- Basis of analytical, mechanistic and organ specific toxicology
- Animal science, including ethics
- Cell toxicity, carcinogenesis
- Ecotoxicology and biomonitoring
- Epidemiology and clinical toxicology
- Genetic toxicity and reproductive toxicology
- Metabolism and kinetics of xenobiotics
- Molecular and mechanistic toxicology
- Occupational toxicology, sensitization, allergy and radiation toxicology
- Pathology
- Risk assessment, regulatory toxicology and information technology

Table 2. Typical occupation

- Clinician: Occupational Health/Epidemiologist: Medical, Veterinary Physician etc.,
- Research Worker: Toxic Mechanisms, Environmental etc., at University, Research institute, Hospital
- Good Laboratory Practice Worker: Toxicology Testing and Safety Research etc.,
- Regulatory Toxicologist: Reviewing, Approving, Inspecting etc.

Table 3. Typical Practical Experience

A Registered Toxicologist will have obtained a Practical Awareness of all of the topics listed below. Over a period of at least 5 years a candidate will have developed in-depth knowledge and experience of at least two of these:

- post-mortem methods and gross pathology
- microscopic identification of the major organs
- microscopic recognition of the major pathological processes
- foetal and neonatal examination for malformations
- making observations and recording signs in animals
- humane dosing, sampling and euthanasia of animals
- in vivo monitoring, biomonitoring
- principles of cell culture
- microbiological methods, e.g., Ames test
- chromosome aberrations, blood film analysis
- sub-cellular fractionation studies

- standard analytical methods: spectrophotometry, gas chromatography, mass spectrometry, high performance liquid chromatography, protein applications, enzyme activity applications, radio chemistry applications
- data handling: data retrieval, data derivation, computer assisted technologies, databases, databanks, data acquisition, statistics, data analysis, determination of pharmacokinetic parameters

Table 4. Typical experience in Communication Skills

A Registered Toxicologist will have achieved a high standard of authorship. This may be illustrated by reference to written papers and/or reports. Examples may include:

- peer-reviewed scientific papers
- confidential reports
- dissertation/thesis
- published proceedings
- reviews
- books or chapters
- invited presentations
- examination papers

An important element of both first-registration and re-registration will be provision of evidence regarding effective communication. A balanced curriculum vitae for a toxicologist will contain evidence of ability to undertake critical appraisals, hence copies of reviews, papers, reports (in confidence if necessary), educational or reference materials pertaining to toxicology will be considered.

EUROPEAN REGISTER OF TOXICOLOGISTS: CANDIDATES FOR RE-REGISTRATION

Table 5. Typical experience demonstrating continuing involvement in toxicology.

- Research and or Projects/Studies
(Number Completed and Number Underway)
- Confidential Technical Reports
(Number, Types and contribution)
- Students trained/supervised
(For what qualification)
- Honors, Awards
(Details of Body Awarding)
- Journal Editorial/Review Boards
(Reviewing/Refereeing)
- Publications
(Indicate those of primary authorship)
- National/international activities

Table 6. Typical experience demonstrating continuing education in toxicology.

- Meetings/Symposia/Refresher Courses
(Dates and Titles)
- Short courses/Speciality Meetings/Workshops
(Dates and Titles)
- Texts, Literature sources used on a regular basis
(Frequency)
- Company/Department Seminars
(Frequency of attendance)
- Risk Assessment
(Frequency)
- Regulatory Activity
(Frequency)

An important element of both first-registration and re-registration will be provision of evidence regarding effective communication. A balanced curriculum vitae for a toxicologist will contain evidence of ability to undertake critical appraisals, hence copies of reviews, papers, reports (in confidence if necessary), educational or reference materials pertaining to toxicology will be considered.

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EUROTOX REGISTERED TOXICOLOGIST

1. Introduction

The EUROTOX Executive Committee wants to encourage registration of scientists working in toxicology. Several proposals were adopted at an open meeting in Prague at the 1995 EUROTOX congress and the implementation of these is to be facilitated by the Registration Task Force, represented by a liaison officer.

The Registration Liaison Officer and his Task Force seek to provide a help-desk, a resource which will provide an interface for national bodies interested in registration of toxicologists. Periodically, by collation of registers from participating national schemes, there will be created a single list of "EUROTOX Registered Toxicologists" - scientists with affiliation in the country of their registration - an important purpose of which will be to further the subject of toxicology in participating countries.

EUROTOX also intends to help its individual members who do not adhere to a national society and who want to identify an appropriate registry. Such people are invited to approach the EUROTOX Registration Liaison Officer with their request and details of their situation.

2. Who should be a "EUROTOX registered toxicologist"

2.1. All those who are currently practicing as toxicologists

Presently, it is acknowledged that there are very many scientists engaged in toxicology in the broadest sense, who must be embraced by a national registration scheme and through this by the EUROTOX registration scheme. This is in order to have proper representation of this multifaceted discipline. Inevitably these people will have become trained and experienced over several years, and by many different pathways.

However well qualified or experienced they appear to be, the onus of proving their suitability for registration will fall to the people themselves, who are currently practicing and who intend to become registered. This registration will in the first place be with their appropriate national body.

It is a matter for the national body to ensure that credentials and qualifications of presently practicing toxicologists who seek to become registered are at least equivalent to (and probably may demonstrably exceed) those of more recently trained scientists.

Indeed in some cases, it may be suggested that possession of an appropriate qualification, such as a recognized and approved diploma in toxicology, will be a convenient way of providing a basis for an application for registration.

2.2. Those training or who intend to begin training to become a toxicologist

Possession of an appropriate qualification, such as a recognized and approved diploma in toxicology, will certainly be a convenient way of providing a basis for an application for registration in future.

To this end, EUROTOX expects that training will eventually take on a more harmonized aspect, be more systematic and possibly, will be on a modular basis. There follows below some ideas regarding suitable training: it is hoped that should a National Society be intending to introduce or to influence new training schemes these would embrace at least the topics and approaches which are introduced below.

3. The starting point: academic requirements prior to registration training

It is expected that an individual will have been educated in a relevant science subject in a full-time taught course at a university (for at least three years) or in a part-time taught course for an equivalent period. To confirm that this is the case, all candidates for registration will be asked to provide certificates of attendance at such courses and success in appropriate examinations.

4. Components of further theoretical toxicological training

4.1. Foundation module

A candidate for registration will have undertaken theoretical training in a broadly based foundation module.

Level of the foundation module

The broadly-based foundation module, which is suitable for those who have not undertaken appropriate training at the undergraduate level, should also be considered as a suitable 'Introductory Module' or 'Orientation Module' for those scientists who are new to the subject of toxicology. EUROTOX recommend that this module be set at the standard and scope of the new 'Textbook of Toxicology'. This long awaited initiative, which is a joint effort of the Netherlands Open University and EUROTOX, is published by CRC Press and is available early 1996*.

Exemption from foundation training, prior to specialization

It is more than likely that parts of the syllabus will have already been certificated and adequately covered within a basic or a postgraduate degree (BS or MS). If so, then some credit can be given for this, and elements of the broadly based foundation module can be omitted. On the other hand the broadly based foundation module should be seen as an 'Introductory Module' or 'Orientation Module' for those who are new to the subject, and for those who have not undertaken appropriate training at the undergraduate level.

4.2. Specific theoretical training

At the completion of foundation training, some specialization will be necessary.

Scope of specialized theoretical training

Specific expertise should be acquired in the following: Animal Science; Cell Toxicity, Carcinogenesis; Ecotoxicology and Biomonitoring; Epidemiology and Clinical Toxicology; Genetic Toxicity and Reproductive Toxicology; Metabolism and Kinetics of Xenobiotics; Molecular and Mechanistic Toxicology; Occupational Toxicology, Sensitization, Allergy, Radiation Toxicology; Pathology; Risk Assessment, Regulatory Toxicology, Information Technology.

Time to be spent on specialized training

As a guide to intensity of study, each specialist's subject will probably involve on average 2 weeks of contact time: although less time may suffice for some of the above (e.g. Epidemiology), others will need more (e.g. Metabolism and Kinetics, Pathology). If studied from the beginning, with no credit given for the content of previous degree(s), then experience in The Netherlands scheme suggests that about 26 weeks, of 30 hr per week contact time, should be allocated to the task of acquiring a suitable theoretical basis for registration in toxicology.

4.3. Characteristics of further theoretical training

Harmonization

Although national differences will be encountered, it is hoped that strenuous efforts will be made to ensure that the quality and performance of participating institutes and teachers, and the standards and conduct of examinations, are harmonized as fully possible.

Modules from more than one institute and country

In principle, it is to be hoped that sufficient harmony will exist such that credits may be obtained from modules based in more than one country. If this is the case, then the way is open for collaborative training schemes, where modules are contributed by more than one institute and country.

Teachers from outside the regular training establishments

In order to stimulate a wide range of teachers, these should be encouraged, if necessary, from outside the regular training establishments, including from commerce.

Cost of the teaching

In principle it is felt that commerce should be invited to help by providing and perhaps by subsidizing the teaching or at least to provide support in terms of time and money, to candidates who are approved for specialized training.

5. Components of further practical training

Practical experience and training

Practical experience and training is essential. The way that this is achieved might be very variable: in some cases toxicologists will undertake intensive research (for example towards a PhD) and be based in a single department: in others, a general training will be gained (perhaps as a Study Director or Reviewer) through commercially-based research or through regulatory activities.

Scope of specialized practical training

Whatever the background, candidates for registration are advised to establish as soon as possible with their National Body that their experience is applicable to their ultimate goal.

Venue for specialized practical training

To obtain eventual registration, suitable practical work may be undertaken in such diverse areas as: Clinical Toxicology in the hospital service; Research into Toxic Mechanisms in a university;

Toxicology Testing under Good Laboratory Practice in commerce, or Regulatory Affairs in a government post.

Time to be spent on practical training

A period of not less than 5 years should be devoted to acquisition of sufficient practical skills. Basic training in at least two (ideally 3-5) of the following should be mandatory: postmortem methods and gross pathology; microscopic identification of the major organs; microscopic recognition of the major pathological processes; foetal and neonatal examination for malformations; observation and recording of signs in animals; humane dosing, sampling and euthanasia of animals; in vivo monitoring, biomonitoring; basic principles of cell culture; microbiological testing methods, such as Ames test, recognition of basic chromosome aberrations, blood film analysis; subcellular fractionation techniques; standard analytical methods: e.g. spectrophotometry, gas chromatography, mass spectrometry, high performance liquid chromatography; analytical techniques: protein separation, protein determination, assessment of enzyme activity; radio chemistry; data retrieval, data derivation, computer assisted technologies, data-bases, data-banks, data acquisition; determination of simple pharmacokinetic and toxicokinetic parameters.

Cost of the practical training

In principle it is felt that employers should invite toxicologist trainees to receive this essential practical training in the work-place.

6. Obtaining registration at the national level

6-1. Characteristics of a nationally approved Registering Body

A participating registration scheme will have lodged (and had accepted) its criteria for registering scientists with the appropriate National Society. The National Society will in turn have lodged these criteria with EUROTOX.

6-2. Attributes of a suitable Registering Body

These may be summarized under three headings:

- Legislative aspects

A suitable registering body will provide an account of what is expected from candidates (expressed in local terms) and evidence of the ongoing quality control of the assessment process for intending registrants.

- Executive aspects

A suitable registering body will provide an account of the constitution and modus operandi of their assessment panel, whose task is to validate the individual's candidature and application for registration, and to recommend or otherwise, the candidate's registration.

- Judicial aspects

A suitable registering body will provide an outline of steps to be taken in the event that there is any objection to the panel's decisions.

6-3. Criteria and methods of assessment

To become registered, in addition to the basic academic training in science, an individual will have achieved minimum standards in theoretical and practical areas outlined above.

Successful candidates will need, in addition to evidence of success in the above:

- Primary authorships

A suitable candidate for registration will have developed communication skills to a high level. One important way in which this will have been demonstrated is through authorship of written papers and/or reports. Examples will be required in applications for registration, and may include peer-reviewed scientific papers, confidential reports, a dissertation or thesis etc. (certified lists of report types may be acceptable in the case of confidential reports).

- Sponsorship

A candidate for registration will be expected to have obtained the support of supervisors and others who are also prepared to act as sponsors and referees.

7. Retaining registration at the national level

- Maintenance of registration

On a 5-yearly basis, a registered toxicologist will be expected to re-affirm his/her registration credentials and illustrate his/her currency.

- Minimum to remain registered

As a minimum to remain registered, a candidate must be able to confirm that they are actively involved in toxicology and that they have partaken of continuing education opportunities. They must be able to supply documentation confirming these facts. To achieve reregistration, an updated CV should be submitted to the assessment panel. This must incorporate all relevant information such as details of post(s) held, papers published, reports supplied, attendance certificates at approved scientific meetings etc. These activities will have been undertaken during the immediately previous period of registration.

8. Retaining registration at the EUROTOX level

Whether an individual becomes registered or retains their registration at the EUROTOX Registered Toxicologist (supranational) level, first of all depends on their registration and continuing registration at the national level, as confirmed by the relevant National Society.

Since EUROTOX does not directly register toxicologists, the accolade of the term "EUROTOX Registered Toxicologist" is therefore available only to those achieving such recognition at the national level.

John S.L. Fowler, registration liaison officer for the EUROTOX Registration Task Force

* Toxicology - Principles & Applications" (ISBN 0-8493-9232-2), CRC Press, London, 1996. Contact the EUROTOX Secretary-General for details.

EUROTOX Newsletter Volume 18, No.2, July 1995

EUROTOX REGISTERED TOXICOLOGIST

Following deliberations of its Task Force (Drs. Fowler, Hodel, Johnson, Kahl, and Temmink; see also Newsletters 14/2: 11-13, 1991, and 17/3: 92-95, 1994) and encouraged by results of a questionnaire, the EUROTOX Executive Committee has decided to progress these matters and thus communicates the following proposals to members in advance of an open meeting to discuss these issues in Prague at the 1995 EUROTOX congress.

EUROTOX intends to interface with organizing bodies concerned with Registration of Toxicologists and reports back periodically to the EUROTOX Subcommittee Education and the EUROTOX Executive Committee via the recently appointed Registration Liaison Officer and the Registration Task Force.

By collating registers from participating schemes (approved nationally and whose criteria comply with EUROTOX guidelines) there will be an opportunity to create a list of EUROTOX Registered Toxicologists with affiliation to the country of their registration.

EUROTOX will also keep an advisory role for its individual members. For those not adhering to a national society, EUROTOX will guide applicants to the appropriate registry; EUROTOX could also play a judicial role in such cases. Such tasks would also be coordinated by the EUROTOX Registration Liaison Officer.

The following proposals are made to the members:

EXPECTATIONS OF A "EUROTOX REGISTERED TOXICOLOGIST"

A. Theoretical curriculum

Purpose

Theoretical training in toxicology, with associated practical working to re-enforce concepts, is essential. Such training can be provided on a modular basis and should embrace at least the topics which are defined below.

Topics

A candidate for registration will have undertaken theoretical training in the following topics areas:

- A0. Foundation: Introduction to analytical, mechanistic and organ specific toxicology. Experiment design, biometry and statistics should also be considered.
- A1. Animal science
- A2. Cell toxicity, carcinogenesis
- A3. Ecotoxicology and biomonitoring
- A4. Epidemiology and clinical toxicology
- A5. Genetic toxicity and reproductive toxicology
- A6. Metabolism and kinetics of xenobiotics
- A7. Molecular and mechanistic toxicology
- A8. Occupational toxicology, sensitization, allergy and radiation toxicology
- A9. Pathology
- A10. Risk assessment, regulatory toxicology and information technology

Time needed

Each module will probably involve on average two weeks of contact time: less time may suffice for some of the above (e.g. A4) whereas others will need more (e.g. A6, A9). If studied from the beginning, with no credit given for content of previous degrees, then about 26 weeks of 30 hr per week contact time should be allocated to undertake the theoretical basis for registration. It is possible that some parts of this syllabus may be certificated as covered in a basic degree (BS) or a postgraduate degree (MS).

Standards and issue of credits

The "Introductory Module" (AO) is to be set at the standard and scope of the "Textbook of Toxicology" (the joint effort of the Netherlands Open University and EUROTOX, published by CRC Press and scheduled for appearance by the end of 1995; see elsewhere in this Newsletter). Candidates for registration will be expected to present credits in all topics.

Although national differences will be encountered, it is desirable that strenuous efforts are made to ensure that the quality and performance of participating institutes and teachers, and the standards and conduct of examination are harmonized as fully possible.

Costs and collaboration

In principle, credits may be obtained from modules based in more than one country. In collaborative training schemes, modules may be contributed by more than one institute and country.

In order to stimulate a wide range of teachers, these should be encouraged, if necessary, from outside the training establishments.

In principle, commercially-based students should be paid for by industry.

B. Practical curriculum

Practical experience and training must be appropriate. In some cases toxicologists will undertake research and be based in a single department: candidates for registration are advised to ensure at the outset that their intended course of study is seen as applicable.

Working areas

For example, to obtain eventual registration, it is likely that work will be based in one of the following areas:

- B1. Clinical toxicology
- B2. Research into toxic mechanisms
- B3. Toxicology testing under Good Laboratory Practice
- B4. Regulatory toxicology

Practical awareness

Although toxicologists work under very diverse circumstances, during a period of not less than 5 years a candidate for registration will be expected to have obtained Practical awareness in the topics listed below. In addition an in-depth knowledge and experience will be expected in at least two (ideally 3-5) of these:

- B5. Postmortem methods and gross pathology
 - Microscopic identification of the major organs
 - Microscopic recognition of the major pathological processes

- Foetal and neonatal examination for malformations
- B6. Making observations and recording signs in animals
Humane dosing, sampling and euthanasia of animals
In vivo monitoring, biomonitoring
- B7. Basic principles of cell culture
Microbiological methods, Ames test
Recognition of basic chromosome aberrations, blood film analysis
Sub-cellular fractionation techniques
- B8. Standard analytical methods: e.g. spectrophotometry, gas chromatography, mass spectrometry, high performance liquid chromatography
Analytical techniques: protein determination, enzyme activity, Western blotting, radio chemistry
- B9. Data retrieval, data derivation
Computer assisted technologies, databases, databanks, data acquisition
Determination of simple pharmacokinetic parameters

Authorship

It is regarded essential that a candidate for registration will have demonstrated a high standard of critical ability. This may be demonstrated through authorship of written papers and/or reports. Examples, whose titles should be included with an application for registration, may include peer-reviewed scientific papers, confidential reports, a dissertation or thesis, essay-type answers in examinations.

Confirmation

For all the above mentioned the candidate for registration will be expected to provide written confirmation of supervisors who are also prepared to act as sponsors.

C. Implementation of registration

- C1. Academic requirements before commencing training
Before starting toxicological training leading to registration, an individual will have been educated in a relevant science subject. They will usually have attended a full-time taught course at a university (for at least three years) or a part-time taught course at a university for an equivalent period.
The candidate for registration will possess certificates of attendance and success in examinations.
- C2. Minimum accomplishments during training
To be considered a candidate for registration, in addition to basic academic training in science, an individual will have undertaken further theoretical and practical training, and will have achieved the minimum standards set in A and B above.
- C3. Relationship of a registering body with EUROTOX
A participating registering body will have lodged (and had accepted) its criteria for registering toxicologists with an appropriate national society. The national society in turn, will have lodged these criteria with EUROTOX.
- C4. Attributes of a participating registering body. A participating registering body will have agreed its criteria for registering toxicologists with its national body (e.g. Society of Toxicology). The criteria will address the following:
Legislative aspects - an outline of what is expected from candidates, expressed in local terms.
Ongoing responsibility for quality control of the assessment process. Executive aspects - a constitution and modus operandi for the assessment panel, whose task is to validate the individual's candidature and application for registration.

Judicial aspects - an outline of what steps will be taken in the event that there is an objection to the panel's decision.

C5. Maintenance of registration

On a 5-yearly basis, a registered toxicologist will be expected to re-affirm their registration credentials and illustrate their currency.

As a minimum, to remain registered, a candidate must be working as a toxicologist, and must submit to their registering body an updated CV confirming that fact. An updated CV should be submitted to the register panel and should contain relevant information such as details of post(s) held, papers published, reports supplied, etc., during the period of registration.

D. Tasks to be undertaken by EUROTOX

In the first place by the EUROTOX Registration Liaison Officer:

- D1. The EUROTOX Registration Liaison Officer on request, will provide an outline of the criteria and resources that will be required, if a member nation seeks to set up its own national scheme within the EUROTOX guidelines.
- D2. The EUROTOX Registration Liaison Officer should be able to provide information regarding registration schemes that are already in existence, thereby possibly avoiding the need to set up and resource new schemes.
- D3. The EUROTOX Registration Liaison Officer should be able to provide information regarding registration schemes that are envisaged, in order to facilitate participation in conjoint schemes.
- D4. EUROTOX intends to provide observers who can assist in setting up and running of national schemes: to be coordinated by the Registration Liaison Officer.
- D5. Training. Generally, through monitoring, schemes designed to facilitate the registration of toxicologists, EUROTOX seeks to identify training needs and encourage the provision of such training.
- D6. Individual members. EUROTOX will provide an advisory role for its individual members. For those not adhering to a National Society, EUROTOX will guide applicants to the appropriate registry and may be able to play a judicial role in some cases. Such tasks would be coordinated by the EUROTOX Registration Liaison Officer.

The task force acknowledges all contributing ideas received including comments from many sources such as: Austria, Croatia, Denmark, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the European College of Veterinary Toxicologists.

VIEWPOINT ON REGISTRATION OF TOXICOLOGISTS

Discussion paper based on the report of May 10, 1994, of the Task Force Registration

REGISTRATION VS. ACCREDITATION

The Task Force distinguishes clearly between *registration* and *accreditation*. Registration may be achieved by recognition solely from within the profession/discipline. This may or may not imply certification. Accreditation may be taken to imply recognition according to statutory rules such as legally binding requirements of Governments or Courts of Law.

At present EUROTOX focuses on registration and supports all activities of creating and maintaining registers in different Countries. This should be an active role in reviewing schemes, setting minimum requirements and giving advice to existing examinations and training schemes.

NATIONAL SCHEMES

In reviewing some existing schemes it became evident that all schemes require (1) an academic base in natural sciences relevant to the field, (2) the presence of both theoretical and practical components in the field of toxicology in the curricula and the assessment criteria, and (3) assessment of candidates by an objective expert group. Some schemes may include re-assessment of the education and experience of the Registrant after a period of about 5 years. Control of the schemes is done by the National Societies and training establishments, or by an independent panel in which the National Society is involved.

Regarding existing national schemes, the Task Force reviewed the Dutch, German and British schemes. These schemes are all voluntary. The Netherlands have a Registration as Toxicological Researcher in the Register of the SMBWO (Foundation for Education and Training of Biomedical Scientific Researchers): this requires both academic education and research training. In Germany an Updated register of toxicologists ("Fachtoxikologinnen/Fachtoxikologen DPGT") is published periodically in the Communications of the DGPT.

In Great Britain a Register has been set up in 1994 under joint auspices of the British Toxicology Society (BTS) and the Institute of Biology (IOB; an independent body with a Royal Charter). The Task Force has been unable to discover any rigid exclusion of non-registered persons from any area of work.

In The Netherlands and Germany the following requirements are to be met in order to become registered as a toxicologist: (1) an academic grade in biomedical sciences; (2) post-academic theoretical and practical knowledge in toxicology, typically a 4 year PhD with research and Course work, and (3) independent research experience as shown by publications in international refereed journals. In Great Britain it is required to have **either** an Honors degree of 1st or 2nd Class in a relevant science (which may include chemistry) taken over a minimum 3-year period from a UK university, or its equivalent, and 5 years relevant experience in the practice of toxicology (this could be regulatory and not necessarily laboratory-based, but must include evidence of practical skills including laboratory), **or** a DIB (Diploma of the Institute of Biology), DRCPATH (Diploma of the Royal College of Pathology in Toxicology), DABT (Diploma of the American Board of Toxicology)

or equivalent qualification, and 5 years relevant experience in the practice of toxicology; **and** assessment for suitability for registration.

In Germany no registration fee is charged. In The Netherlands a once-only fee of DFL 200 has to be paid. In Great Britain one is charged an entry fee of £ 25 and a retention fee off £ 10 per annum.

CONCLUSIONS

EUROTOX should not create a centralized scheme, but actively watch the evolution in the National Societies. It should help those societies who want to set up registration schemes, and it should define basic requirements. EUROTOX should stimulate national registration and set minimum requirements. As a basis the European Guidelines for the training of toxicologists as published in Newsletter 14/2, pp. 11-13 (1991) and/or the WHO Target Curriculum for a Category I Toxicologist (WHO: Manpower development for control of chemicals, Copenhagen, 1981) can serve as a starting points. EUROTOX should, based on suggestions from National Societies, revise these requirements and adapt them to the present needs. EUROTOX may also be able to assist in evaluation of institutions for practical training. In addition EUROTOX could review existing examination and training schemes and make recommendations. A basic requirement should be the ability of the candidate to reach an integrated view of problems in toxicology.

EUROTOX Should liaise with corresponding professional toxicology societies, especially in other continents (e.g. Japan, USA, Australia). The liaison should also include government bodies and the EU commission relevant for the topic.

In order to be able to fulfil these tasks, it is recommended that EUROTOX appoints a liaison officer, who collects the information, sets up the necessary links, and proposes to the Executive Committee what personnel and financial resources are needed.

In conclusion the Task Force feels that, although at present there is no unified system of registration available to European toxicologists, in consideration of existing or planned schemes care should be taken to ensure that these possess certain fundamental characteristics. In particular a suitable scheme should adequately address the need for candidate toxicologists to have acquired significant critical ability. The Task Force feels that a candidate must have demonstrated an ability to plan and produce a coherent response to a question: this can best be assessed by reference to peer-reviewed published works, by performance in essay-type examination questions, reference to a recent dissertation or thesis on a toxicological subject, and by viva voce examination.

Task Force Registration, July 12, 1994

Appendix: II. Japanese System Description
As provided by: Hideaki Karaki, MD, Ph.D.
President of the Japanese Society of Toxicology
Professor and Chairman of Veterinary Pharmacology
The University of Tokyo
Bunkyo-ku, Tokyo 113-8657, Japan
ahkrki@hongo.ecc.u-tokyo.ac.jp
FAX +81-3-5802-2959

Certification and Licensing for Toxicologists Authorized
by Japanese Society of Toxicology

1. Purposes:

In consideration of the importance to improve the reliability of various toxicity testings under Good Laboratory Practice (GLP), Japanese Society of Toxicology (JST) shall build up a new certification and licensing program for toxicologists authorized by JST and admit high-qualified experts in this field in order to have them contribute to the advanced reliability as well as progress of the area of safety evaluation testings of chemicals in Japan.

2. Committee on Certification Examination:

In order to conduct the test for the examination of certification of toxicologists, JST shall form a committee on the certification examination hereinafter referred to as "Committee". Details of the Committee to be conducted shall be laid down separately.

3. Certification Examination:

(1) Those who are desirous of receiving a license of qualified toxicologist are obliged to pass the examination about their report and closed book examination to be prepared by JST.

(2) Examination of the report as well as certification test shall be conducted by the Committee. Final authorization shall be approved by the Board of Trustees of JST.

(3) Eligibility requirements for the applicants who are desirous of taking an examination of the report shall be:

- (i) any member who has belonged to JST over 5 consecutive years at the time of application; and
- (ii) any one who has had enough experience in the practice of toxicology for at least 5 years for any university graduate (six-year school course), 7 years for any university graduate (four-year school course), and corresponding years for any other graduates; and
- (iii) anyone who has reached a total points of 80 or more in the attached criteria for the certified application to the examination and test.

(4) Certification Examination shall be conducted normally once a year in the form of closed book examination.

(5) 30,000 Yen shall be paid as a fee for the examination.

(6) Details with respect to the judgment on the certified application as well as test shall be laid down separately.

4. License:

(1) Persons who have passed the Certification Examination will receive a certificate after payment of 20,000 Yen.

(2) Any qualified toxicologist who turns out not to be eligible as qualified may lose his/her license.

5. Recertification of Authorized Qualification:

Every 5 years after the license is granted, certified toxicologists shall have to make a recertification of their qualification. Details on the said renewal shall be laid down separately.

6. Others:

Any amendment of this program shall be made on the motion of the Directors of JST and shall be authorized by the approval of the Council as well as General Assembly of JST.

Additional Clause:

These regulations shall become effective on July 24, 1997.

Table: Eligibility requirements for admission to the Certification Examination Classification

1. Toxicological articles

1) Number of toxicological articles published in the Journal of Toxicological Sciences: 10 (5)*

2) Number of toxicological articles published in other periodicals**: 5 (2)*

2. Presentation at the academic society

1) Number of presentations at the JST-sponsored meetings

Presentation: 5, Publication: 10 (5)*

2) Number of presentation at satellite symposium authorized by the JST

Presentation: 3, Publication: 5 (2)*

3. Lecture meeting under the auspices of the JST

Number of presentation before 1997: 10

Number of presentation after 1998: 40

* Points in the parentheses shall be given for the co-author or co-presenter who is not the main author or main presenter.

**Periodicals concerned shall be limited to the ones with efficient referee system.

Extent and Extent of Certification Examination

1. Extent:

1) Adverse effects of chemicals (25%):

Metals, organic solvents, pesticides, gases, dusts, industrial chemicals, radioactive compounds, plant poisons, animal poisons, food additives, drugs, cosmetics, biotechnology products.

2) Manifestation of toxicity/Toxicity testings (40%):

General toxicity (including clinical tests and their significance), general pharmacology, mutagenicity, carcinogenicity, reproductive and developmental toxicity, respiratory organ toxicity (including inhalation toxicity), neuro-behavioral toxicity, immunotoxicity, skin/mucosa toxicity (including gastro-intestinal) toxicity), blood/hematopoiesis toxicity, cardiovascular toxicity, hepatotoxicity, nephrotoxicity, endocrine toxicity, motor apparatus toxicity (including bones/muscles/joints), sensory organ toxicity (including ophthalmic toxicity), experimental method of toxicity (including experimental animals).

3) Principle of toxicology/Applied toxicology (35%)

General principle, influential factors in toxicity, toxicokinetics, pharmacokinetics, mode of toxicological manifestation, risk assessment, environmental toxicology, epidemiology, clinical toxicology, biostatistics, regulatory toxicology.

2. Level:

- 1) With respect to regulations detailed knowledge of the provisions shall not be requested, but understandings concerning regulatory intervention in the guarantee of safety, adjustment among various guidelines, and goals of guidelines and GLP shall be asked.
- 2) Besides regulatory toxicology, any subject shall be conformed to the following text books:
 - i) Casarett and Doull's Toxicology: The Basic Science of Poisons (C. D. Klaassen, Ed.), 5th ed., McGraw-Hill, New York (1996), and
 - ii) Goodman & Gilman's The Pharmacological Basis of Therapeutics (J. G. Hardman et al, Eds.) 9th ed., McGraw-Hill, New York (1996)
- 3) Specified knowledge or past thought shall not be requested, but most possible updated knowledge and basic principles shall be asked.
- 4) Contents and severity of the test shall be similar to those of ABT-sponsored examination. The passing mark shall be 70 points or more.

Details of the First Certification Examination

Date: October 11, 1998

Time: 9:30 -17:00

Location: Faculty of Agriculture, University of Tokyo, Building No.1, Room No.8

Number of Applicants: 121

Number of Participants: 119

Number of Successful Participants: 49

Ratio of Successful Participants: 41%

Number of Questions to be examined: 200 (one out of five in an alternative way)

Passing Standard: Percentage of correct answer is 70 points or more

FOOTNOTE TO ABOVE:

I would like to add an explanation on the Table for Eligibility requirements for admission to the Certification Examination. It says as follows:

3. Lecture meeting under the auspices of the JST

Number of presentation before 1997: 10

Number of presentation after 1998: 40

In 1998, we have started a lecture meeting to prepare for the Certification Examination. Before then, we had a lecture meeting for the purpose of general education. Because the purpose and contents of the lecture are different before and after 1998, points given to the entries are different.

ASIATOX News Letter: September 1998

Progress Report on the Accrediting Toxicologists in Japan

Kurokawa, Y. MD., Ph.D., President, Japanese Society of Toxicology, Tokyo

In 1993, necessity of the certification of toxicologist was discussed, for the first time, at the 4th Fundamental Education Course of Toxicology sponsored by Education Committee of The Japanese

Society of Toxicology(JST). In 1995, Working Group in Education Committee began to examine the current situation of the certification abroad, especially of the American Board of Toxicity. Chairman of the Education Committee reported at the 23 rd general assembly of the JST in July, 1996 as follows. The certification is necessary. The implementation of the certification, however, entails many complicated problems such as: Who should be first certified by whom ? What are the criteria and definition of Certified Toxicologist? What are the privilege and role of Certified Toxicologist? Thus, it was decided that the implementation should be dealt with the General Affairs Committee.

Pilot Survey Sub-committee in General Affairs Committee reported seven issues at the Working Group Meeting in September, 1996 as follows.

1. NECESSITY OF CERTIFICATION: The certification is necessary in order to improve the quality of toxicologists, especially of Study Directors of toxicity testings which are required by the respective Guidelines and should be conducted in conformity with their GLPs. The certificate will also stimulate the advancement of toxicology, by promulgating the standard of professional practice.

2. DEFINITION OF TOXICOLOGIST: Certified Toxicologist should have knowledge which encompass all aspects of the toxicological field and should have the ability for proper toxicological planning, testing, evaluation and risk assessment. The risk assessment should be done by extrapolating the animal data to human, with the knowledge of mechanism of toxic manifestations and dose-responsibility and species difference.

3. THE CERTIFICATION EXAMINATION:

1)Examination Committee should take responsibility for the examination.

2)Eligibility: An applicant must have had a principal involvement in the practice of Toxicology.

3)The scope of examination :The examination covers all aspects of toxicology and toxicity testings.

4. CERTIFICATION: Certification will be awarded by the President of JST.

5. RECERTIFICATION: Diplomates should be evaluated every 5 years for recertification by active practice of toxicology and maintaining expert knowledge in general toxicology.

6. EDUCATION COURSE: Education course in agreement with scope and level of examination should be held by Education Committee at least once a year.

7. RELATIONSHIP BETWEEN CERTIFIED TOXICOLOGIST AND PATHOLOGIST:

Pathologist should have professional ability in pathological examination and toxicologist should have broad professional ability in general toxicology such as design, conduct, evaluation, and risk assessment. For proper assessment of toxicity of chemicals cooperative work of both profession is inevitable.

The followings were decided at the first meeting of Working Group for Implementation of Certification of Toxicologist held in January, 1997:

1. The first examination is to be held in fall, 1998

2. Select Grandfathers for the execution of the examination and preparation of questions.

3. The scope and level of the examination will be determined by July, 1997.

4. The education course should be held by Education Committee before the first examination.

5. The rules and procedures for the certification, organization of Examination Committee and recertification policy will be fixed at General Assembly in July, 1997.

Grandfathers were selected by Working Group for Implementation of Certification of Toxicologist by the following criteria regarding qualification, publication, activity at JST and contribution or attendance to education course. The councilors who obtained 80 points or more of maximum points of 100 were selected as Grandfathers.

Accordingly, 99 Grandfathers were selected by the Working Group from the Councilors of JST who are willing to participate in Certification Examination and preparation of Examination Questions. They were approved at the General Assembly of JST in July, 1997.

The rules for the Certification of Toxicologist of JST was adopted at the same General Assembly. The rules include:

1. Organization of the Examination Committee.
2. Certification Examination which consists of Criteria for Certification (publication activity for The Journal of Toxicological Sciences and attendance to the Education course), Examination Eligibility (at least 5 years as the member of the JST and the experience as the toxicologist for 5 to 7 years) and Closed-book Examination.
3. Certification Procedure.
4. Recertification.

Examination Committee was organized in September and had the first meeting in October, 1997 to fix Scope and Level of Examination, and Guidelines For Submission of Examination Questions (including detailed contents of questions and question submission form) based on the following policies:

- 1) examination should cover all aspects of toxicology,
- 2) the level should be equivalent to that of ABT Examination,
- 3) questions should emphasize broad concepts and principles of toxicology, and reflect current science of toxicology,
- 4) recommended reference source is Casarett and Doull's Toxicology: The Basic Science of Poisons 5th ed., (1996), but other sources such as Goodman & Gilman's The Pharmacological Basis of Therapeutics 9th ed., (1996) can be used if necessary.

For the Education Course, the lecturers were nominated from the Grandfathers. The lectures include almost all areas toxicology, such as general toxicology and pharmacology, hematopoietic toxicity, mutagenicity, carcinogenicity, neurotoxicity, endocrine toxicity, immunotoxicity, environmental toxicity, hepatotoxicity, renal toxicity, reproductive toxicity, risk assessment and management. Accordingly, the Education Course for Certification of Toxicologist was held July 30, 31 and August 1, 1998 at the School of Pharmaceutical Sciences, Kitasato University, Tokyo where 171 persons attended. After the lectures, preliminary examination was performed. Certification Examination, that is the Closed-book Examination will be held in October 11, 1998 at University Tokyo for which 120 persons have applied. Name of The Certified Toxicologists of the JST, who have obtained more than 70 points at the Exam, will be announced by the end of 1998.

As I have stressed at the Workshop of the ICT VIII entitled 'Should there be an international accreditation of toxicologists?' I believe that in order to stimulate the advancement of toxicology world wide, an internationally harmonized standard for certification of toxicologist is really necessary.

APPENDIX III. American Board of Toxicology, Inc. Information

AMERICAN BOARD OF TOXICOLOGY, INC.

Instructions and Application for the ABT Certification Examination in General Toxicology

The American Board of Toxicology, Inc. was incorporated in the District of Columbia on April 17, 1979. It is a self-sustaining, independent, not for profit corporation which is not associated with any professional society or interest group.

The Board awards certificates to persons who have met the eligibility requirements for admission to the Certification Examination and who have met the Certification Examination requirements within a two year period of eligibility.

Criteria for Certification Examination Eligibility

It is the responsibility of the applicant to convince the Board that the eligibility requirements have been met. Any deviation from the requirements must be submitted to the Board for approval.

One of the following three combinations of education and experience are necessary to meet the eligibility requirements for admission to the Certification Examination.

1. An applicant must possess an earned doctoral degree in an appropriate field and have at least three (3) years of full-time professional post-doctoral experience (or part-time equivalent thereof) in toxicology after official conferral of the doctoral degree. The three years of experience must be after the date on which the doctoral degree was awarded officially. Having completed all requirements for the degree, but not having received the degree will NOT suffice.

2. An applicant must possess an earned master's degree in an appropriate field and have at least seven (7) years of full-time professional post-baccalaureate experience (or part-time equivalent thereof) in toxicology.

3. An applicant must possess an earned bachelor's degree in an appropriate field and have at least ten (10) years of full-time professional post-baccalaureate experience (or part-time equivalent thereof) in toxicology.

Scholastic work towards a higher degree is not considered to be professional level experience. Individuals working toward a higher degree while employed full-time in the practice of toxicology may receive appropriate credit for work experience upon complete documentation, if the total time is based on a BS or MS degree. Years of experience shall be determined as of June 30th of the year of application, using the actual date the degree is awarded and not the date requirements were completed. The degree must have been awarded officially 3, 7, or 10 years prior to June 30 of the year of application. The applicant must have full-time involvement in the practice of toxicology within the year immediately prior to the date of application.

With respect to experience in the practice of toxicology, a candidate should have carried out one of the following functions: designed and managed toxicological experiments, interpreted results and translated them to identify and solve human and animal health problems. It is not sufficient that the candidate work with or for toxicologists. The applicant must be responsible for the professional toxicological work conducted. These experiences should account for the majority of "time in professional practice" used to support the application.

A candidate need not necessarily actually produce or develop data that he then uses in assessing and evaluating toxicity. With an appropriate educational background and/or previous toxicology experience, a candidate may be engaged in interpreting data generated by others and then may use this data and information to synthesize a comprehensive toxicity assessment. With sufficient documentation of educational training and/or specific experience, such a candidate could be eligible to take the examination. Likewise, because of the broad scope of toxicology, it should not be expected that all qualified candidates be engaged in the design, conduct, evaluation and interpretation of cellular or animal toxicity studies. Sufficient evidence should be provided that there is an understanding of such studies, the best evidence being a prior history of having been personally engaged in these types of toxicity studies.

Being engaged in activities such as environmental monitoring, exposure monitoring, biological monitoring, monitoring of workers, etc. in and of itself does not constitute the practice of toxicology. If the results from these activities are utilized by the candidate in a broader context of assessing toxicity and if the candidate's educational background and/or previous experience indicates appropriate training in toxicology, monitoring activities and application of their results may constitute the practice of toxicology.

For a candidate engaged in data reviews of existing toxicity information, identification of toxicity data gaps, identification of structure-activity relationships of potentially toxic chemicals, maintaining data bases, development of risk assessment methodologies, preparation of health assessment documents, etc., the application must unequivocally document that the candidate utilizes the information in an integrative fashion in the broad context of a comprehensive toxicology evaluation. Reviewing data and simply preparing warning labels for a product using a "by the numbers" approach does not constitute the practice of toxicology, nor does simply maintaining a data base and publishing the results. Developing risk assessment methodologies by applying the data and then adjusting the mathematical model parameters without demonstrated understanding of the data or the broader aspects of toxicology does not constitute the practice of toxicology.

Providing managerial guidance or consulting support for specific clients or for purposes of litigation could include defining toxicity, hazard and risk, dose-response evaluation, duration of exposure and evaluation of toxicity data to assess the likelihood of adverse effects associated with exposure to potential toxicants. In these cases, appropriate educational training and/or experience in previous or other job activities may provide the necessary link to judge that the applicant is engaged in the active practice of toxicology. Merely translating the jargon of the various sciences into layman terminology does not constitute the practice of toxicology.

All applicants will normally be notified of their eligibility during the latter part of August. All applicants are urged to initiate their preparation for the examination well before the notification date. The Examination usually will be given in mid-October.

Applicants judged to be ineligible to take the Certification Examination will be refunded one-half (\$150) of the application fee.

Duration of Eligibility:

Eligibility to take the examinations is valid for two (2) successive examination periods only. If for any reason the applicant does not pass the examination within the period of eligibility, reapplication with forms, fees and supporting documentation is necessary before eligibility can be reestablished. Please see Time Requirements for Certification details. Eligible candidates who fail to appear for an examination will lose that year of eligibility. Candidates who do not pass or fail to take the

examination in the first year do not need to resubmit the application form in order to take the examination again in the second year. In both of the above cases, the full application fee will be retained. It is the responsibility of the candidate to notify ABT of any address change during the period of eligibility.

The Certification Examination consists of three (3) parts of 100 multiple choice questions each. Each part is graded independently. To become certified, the candidate must pass 1) all three parts of the examination during the first year of eligibility; 2) any two parts during the first year and the third part in the second year; or 3) all three parts in the second year.

The Certification Examination

The Certification Examination is composed of three major subject areas. These subject areas and their sub-topics are:

I. Toxicity of Agents: metals; organic solvents; pesticides; inhaled gases, dusts, aerosols, etc.; natural toxins; industrial chemicals; drugs and cosmetics; and food additives.

II. Organ Systems and Effects: mutagenesis, carcinogenesis, developmental toxicology; reproductive toxicology; inhalation toxicology; neurobehavioral toxicology; immunological toxicology; cutaneous toxicity, ocular toxicity, hematopoietic toxicity, hepatic toxicity, renal toxicity; and endocrine-related toxicities.

III. General Principles and Applied Toxicology: general principles; toxicokinetics; factors influencing toxicity; risk assessments; epidemiology and biostatistics; regulatory toxicology; environmental toxicology; industrial and occupational toxicology; and forensic and clinical toxicology.

General Instructions:

Complete the information required on the application form and return it with a check for three hundred (\$300) U.S. dollars. All fees and costs related to conversion of foreign currency are the responsibility of the applicant. The completed application and fee must be mailed to the ABT Office postmarked no later than April 30 of the year in which the applicant first wishes to take the examination.

Applicants must arrange for an official transcript of the degree used as the basis for qualification to be forwarded directly from the granting institution to the ABT Office. This document must reach the ABT Office by May 31. If it is not possible to obtain official transcripts from non U.S. colleges or universities, applicants must provide notarized copies of their diplomas and a listing of courses passed. If notarized copies of diplomas or course listings are not provided, the applicant must satisfactorily explain their omission.

Applicants must arrange for letters from present and former supervisors (or in the case of the self-employed, a client(s) or colleague) to be forwarded to the ABT Office. These letters must explicitly specify the time period of job performance, and must accurately and fully document the applicant's duties, responsibilities and full-time professional experience in toxicology. The supervisor should review the above section on experience in toxicology before preparing the support letter. The supporting letters must cover the entire period of experience required with the actual degree conferral date used as the basis for qualification. The letters may contain other information as deemed appropriate by the supervisor or employer. The letters must be postmarked by May 31.

It is the responsibility of the applicant to assure timely receipt of the required documentation. Incomplete or late documentation will result in an ineligible status. Do not assume that transcripts or letters of verification requested from a third party have been sent to the ABT Office. If you are unsure, call the ABT Office to confirm.

The Eligibility Committee of the ABT must have a complete dossier to review. The applicant must describe his/her experience as a toxicologist, including full job description(s) and bibliography (curriculum vitae). A listing of related toxicology activities is helpful. To aid in the preparation of complete documentation describing the applicant's experience in toxicology (#3 on the certification application form), several suggestions are listed below. These suggestions should be regarded as guidelines. The applicant may wish to provide additional relevant information.

Specific Instructions:

Simply providing the job title will not suffice. Duties and responsibilities can be described in terms of time allocated to specific activities, types of studies or functions performed, reporting relationships, toxicology personnel supervised, students or postdoctorals trained, numbers and types of technical reports prepared and role played in the preparation of such reports, etc. Thoroughness is essential; provide specific and detailed descriptions of each aspect of present and past employment activities in toxicology.

Many scientists with newly acquired degrees have a training period for the conduct of toxicological studies, or apply a previously acquired skill as a part of an overall team effort to toxicological studies. At what point within their scientific contribution and growth has "skilled technical work" changed to "full-time professional experience in toxicology"? For purposes of definition of eligibility criteria, "full-time professional experience in toxicology" will begin when the individual has demonstrated the capability to conduct the toxicological study in an independent manner, to prepare a valid report of results and to understand the interpretation of the toxicological study for professional use.

This definition will apply to post-doctoral as well as post-baccalaureate experience in toxicology. It will be incumbent upon the applicant, and particularly upon the sponsors of applicants, to provide adequate documentation to satisfy the definition.

A formal position description may be attached, but may not be sufficient by itself.

A list of publications using full bibliographic citations should be attached. Full length publications, review articles, books, chapters and abstracts should be listed under their respective headings. List the name(s) of the supervisor(s) who will provide a supporting letter and the time periods they are covering.

Example of Toxicology Activities:

Presentations or interactions with regulatory, governmental or other international agencies; invited lectures, seminars, or participation in symposia. Positions or memberships in professional, trade or academic associations, adjunct appointments; courses taught (indicate number of hours or lectures and brief summary of content), etc. Honors, awards, appointments or other recommendations received from professional, academic, industrial or other organizations. A listing of continuing education activities since obtaining highest degree. These activities could include: professional meetings attended (provide dates); short courses, workshops or specialty meetings attended; titles of journals read regularly; etc. All forms, fees, supporting documentation and other materials

submitted to the American Board of Toxicology become the property of the Board and will be maintained in confidentiality solely for evaluation of the candidate to sit for the certification examination.

Time Requirements for Certification

Each period of eligibility to sit for the examination is of two years duration. An individual who is found by the Board to have the credentials may sit for two examinations within that period of eligibility. Should he/she fail to pass the examination in the initial two years, the candidate may immediately seek a second period of eligibility. This procedure allows each candidate to apply for eligibility for a total time period of four years and sit for the certification examination once in each year. If an individual fails to become certified after two, two-year periods, that individual cannot reapply for the next two years after the last examination. The candidate will then be permitted to apply for one additional period of two years. Should the individual fail to pass the certification examination in that final two year period, he/she would not be permitted to sit for the examination at any time in the future.

In summary, acquisition of certification will be limited to a total of eight years, and within the eight years the individual may sit for the examination for six years (four years initially, and for two years after a two-year hiatus). Except as indicated below, each candidate must pass the certification examination within the six opportunities presented.

Should extenuating circumstances be presented, which might be ruled beyond the control of the applicant, either the first four years of eligibility or the final two years of eligibility might be extended. Decisions concerning extenuating circumstances will be made by the Board on an individual basis. Should an individual pass two parts of the examination on the last try of the first four years or last two years of eligibility, that individual would be given one additional examination to pass the one remaining part of the certification examination. If only one part of the examination is passed on the last try of the first four years or last two years of eligibility, the candidate would be subject to the constraints given above.

Revised 3/99

Benefits of Certification by the American Board of Toxicology

The ABT was founded in 1979 to establish a process for certification in toxicology which would demonstrate competence. The success of the ABT has been overwhelming. The number of diplomates has grown annually with currently over 1,500 individuals in toxicology or related fields. ABT diplomates are employed by government (15%), industry (55%), academia (10%), consultant (10%), and other agencies (10%).

ABT diplomates participate in all aspects of the profession of toxicology including: the design and interpretation of safety studies for product development; review and interpretation of such studies for regulatory compliance; basic and applied research into toxic effects, mechanisms of toxic action, toxicokinetics and toxicodynamics; and education of undergraduates, professional and graduate students and the public in the science of toxicology through courses, legal cases and media interactions.

While the majority practice in the USA, ABT diplomates are found worldwide, including Europe and Australia. The acceptance of ABT certification as a qualification for membership by the national

registries of several European countries, and thus by Eurotox, demonstrates ABT's leadership role in the certification of toxicologists.

ABT considers periodic recertification of diplomates as essential to maintaining high standards of professional competence. Recertification is conducted at five year intervals and requires demonstration of continuing education and the active practice of toxicology, as well as an examination.

The following benefits of ABT certification should be considered by all toxicologists and their employers.

Benefits to Toxicologists

ABT certification recognizes broad expertise in general toxicology for those with formal training in toxicology, as well as those trained in other related disciplines.

ABT certification provides personal satisfaction and intellectual stimulation.

ABT certification often offers an advantage in the job market and career development.

ABT certification enhances credibility in consulting and legal testimony.

Benefits to Employers

ABT certification provides an objective demonstration of a toxicologist's breadth and currency of knowledge and supports scientific credibility. Certification by the ABT facilitates access to other certified colleagues who can provide expertise in diverse areas. ABT certification is recognized by the national registries in several European countries, and thus, by the Eurotox.

Benefits to Society

The ABT certification is recognized as the standard for competence in general toxicology based on demonstration of appropriate educational background, active practice of toxicology and examination. ABT diplomates are required to demonstrate currency with respect to new developments in toxicology through recertification at 5 year intervals, thus, providing timeliness in the assessment of toxicological issues of concern to society. ABT's certification process is recognized world-wide, thus providing a consistent international standard of competence and expertise on toxicology issues.

AMERICAN BOARD OF TOXICOLOGY POLICY OF RECERTIFICATION

The American Board of Toxicology, Inc. (ABT) certifies individuals in general toxicology through a process that evaluates expert knowledge as demonstrated by education, experience and passage of a comprehensive written examination. Certified individuals are initially recognized by being designated as Diplomates of the American Board of Toxicology for a period of five (5) years.

Other ABT objectives are to encourage the study of the science of toxicology and to stimulate its advancement by promulgation of standards for professional practice. It is ABT policy that Diplomates demonstrate a continual commitment to excellence in the science of toxicology and

maintenance of expert knowledge of general toxicology. Successful achievement of these goals as outlined by the Board will result in an individual maintaining recognition as a Diplomat by the ABT.

The ABT has identified three (3) performance criteria by which a Diplomat will be evaluated pursuant to recertification. These criteria are: Active Practice of Toxicology; Continuing Education; and Maintaining Expert Knowledge in General Toxicology. Each Diplomat, at the beginning of the fourth year of their current certification, will be required to apply for recertification. ABT will review activities in each of the three performance areas and notify the Diplomat of acceptable progress or deficiencies that need to be addressed. If, in the opinion of the Board, a Diplomat is not compliant with each of the three criteria at the end of the fifth certification year, that Diplomat may be required to successfully pass the formal certification examination. Diplomates who are compliant with each of the three performance criteria will be certified for an additional five years.

Active Practice of Toxicology

Active practice is defined as performing, directing or managing toxicology activities such as research, testing, teaching, clinical practice or regulation.

Examples of Active Practice of Toxicology include:

- a) Maintenance, commendation or advancement in the level of responsibility associated with a Diplomat's toxicology responsibilities.
- b) Invitation to lecture on toxicology themes at university courses, scientific meetings or symposia, presentation of posters which describe toxicological research.
- c) Publication of research, test results, review articles in toxicology, chapters in test books, etc.

Continuing education

A successful program of continuing education may encompass a myriad of diverse activities. The study of published texts, periodicals, or scientific journals germane to toxicology are means by which Diplomates routinely maintain or expand their knowledge of toxicology. Other evidence of a commitment to continued education is attendance at specific programs where toxicology themes are presented in a comprehensive or in-depth manner. Such programs are often held during general or annual meetings of the Society of Toxicology, American College of Toxicology, FASEB, Environmental Mutagen Society, Teratology Society, American Association for Cancer Research or Chapter Meetings of the Society of Toxicology. Attendance Forum or Target Organ Conferences also provide opportunities to maintain or expand a Diplomat's knowledge of toxicology.

Maintaining Expert Knowledge of General Toxicology

It is held that an objective mechanism is required for the Diplomat and ABT to gauge the success of their efforts to maintain expert knowledge in general toxicology. A recertification examination prepared by the ABT is to serve in this evaluation process. Diplomates will have the opportunity to privately complete the recertification examination during the fourth year of their certification period using their own reference material as needed. The completed examination will be graded by ABT and returned to the Diplomat. The Diplomates will be furnished a comparison of their results with the performance of peers for each subject area. Stimulated by these results the Diplomat would be expected to tailor a continuing education program that addresses those subject areas in which their

knowledge appears to have diminished. The ABT may ask a Diplomate to complete specific portions of the recertification exam to assess the success of their focused continuing education program.

Summary of Recertification Process

Certification Years 1, 2 and 3

Diplomate maintains personal file of activities germane to the Active Practice and Continuing Education criteria for recertification, i.e., name of meeting attended, number of hours, title, topics, faculty, etc.

Certification Year 4

1. Diplomate notified by ABT that formal application for recertification is required.
2. Diplomate submits application for recertification and provides data in support of continuing education and active practice. Applicant also submits recertification fee in the amount established by the ABT Board of Directors.
3. Diplomate receives and completes recertification examination. After two recertifications have been completed, subsequent recertifications will require that three satisfactory examination questions may be submitted in lieu of the recertification examination.
4. ABT reviews application and provides interim opinion as to satisfactory progress. ABT provides summary of test results and identifies subject areas, if any, that need study on the part of the Diplomate.
5. Diplomates deficient in certain subject areas develop focused continuing education program.

Certification Year 5

1. Diplomates deficient in certain subject areas may be required to retake selected portions of the recertification examination.
2. Any Diplomate who changes job positions within the past year must update application.
3. Final ABT review of recertification application and either:
 - a) Recertifies Diplomate for an addition five year period.
 - b) Requires passing of the formal certification examination for those Diplomates deficient in their recertification effort.

EXAMINATION TOPIC AREAS (see web page again for info)

Current Exam Question bank status:

DRAFT OF THE FRENCH REGISTRATION PROPOSALS BASED ON COMMENTS RECEIVED FROM THE EUROTOX TASK FORCE

French National Register of Toxicologists and Committee acknowledged by EUROTOX

MEMORANDUM to candidates for registration on the French List

In 1995, EUROTOX established guidelines for the registration of toxicologists at a National Level. National Societies who have schemes for registration that meet the guidelines may submit lists of Registered Toxicologists; for collation by EUROTOX into a European Register.

Rules of the French National Registration Committee

Who is a Toxicologist?

A toxicologist studies the toxic effects related to the exposure to a toxic substance, the mechanism of action, and the consequences on human beings and on ecosystems, as well as the prevention of the effects and the treatment of intoxication.

Purpose for Registration of a Toxicologist

Through registration, a toxicologist aims to affirm his competencies and offer to the public, and to any organization interested in human resources, people qualified to approach problems of a toxicological nature, within the National Society of Toxicology. The French scheme of registration concerns any person whose experience is recognized and who deals with toxicology. To join the French List the candidate has to fulfil the following requirements:

- an appropriate training with the corresponding qualification (doctorate, PhD, doctorate in Pharmaceutical Sciences, Medicine, Veterinary Sciences, or equivalent, etc., as well as current practical experience in one of the fields of Toxicology,
- the French list in its turn endeavors to take into account the multiplicity of initial training and background of candidates and, through education, protect the profession of Toxicology and provide evidence of quality amongst its toxicologists.

Constitution of the French National Registration Committee

1 The French National Registration Committee is comprised of the following:

Dr JP Briffaux VMD, PhD Representative of Industry
Prof. J R Claude, Pharmacist; PhD Representative of Academia and Industry
Prof E E Creppy, Pharmacist, PhD, Academic, EUROTOX Registration Task Force, Secretary
Prof S Dally, MD, PhD, Academic, Representative of Clinicians
Dr. I Glomot Pharmacist, PhD, Representative of Industry
Prof A. Guillouzo, Pharmacist, PhD, Academic
Dr. P Kintz, Pharmacist. PhD.. Academic

The Committee has been elected by the general assembly of the French Society of Toxicology. Remi

GLOMOT is the current President of the SFT and S. DALLY is already appointed to be the next President.

2. The French National Registration Committee can accept or refuse to register a person on the list or can cancel a registration if any inaccuracy is discovered after the registration has taken place. Two-fifths of this commission will be renewed every five or seven years, depending upon the number of candidates applying, and based on voluntary help.

The Workings of the French National Registration Committee

1. The secretary of the **French National Registration Committee** will also be the French Register's representative on the EUROTOX Task Force.
2. The **French National Registration Committee**:
 - establishes a list of toxicologists and keeps it up-to-date.
 - publishes the updated list every year, sends the Registration Application Forms and decides the rules of registration. For this purpose, an office of secretary is created with its own budget, under the auspices of the French Society List (SFT).

The French Society List will be published at the end of 1997. Registrants will be reviewed every five years, and kept up-to-date every year by adding the newly registered toxicologists.

- studies the applications for registration and establishes a record of the decisions made-
- seeks to co-ordinate its activities within the current EUROTOX guidelines.
- produces an annual report for the Bureau of SFT and its General Assembly-
- gives, to anyone who asks information which may be useful for registration on the French Society Scheme.

Making Application to the French National Registration Committee:

In the Registration File, each candidate has to indicate

- the field of Toxicology in which he wants to be registered (minimum one; maximum three). For example, Experimental Toxicology, Clinical Toxicology, Analytical Toxicology, Genetic Toxicology, Forensic Toxicology, Pathological Toxicology, Regulatory Toxicology, Ecotoxicology, Environmental Toxicology, etc. (the list is not limited).
- his or her registration on an analogue list in Europe, or America, or elsewhere

The registration is valid for a period of five years. Its validity may be extended for an additional period of five years, provided that the **French National Registration Committee** receives a written request and evidence of continuing professional development from the registered toxicologist.

The registration is null and void at the end of the five year period if no written application request for renewal has been received by the **French National Registration Committee**.

Registered toxicologists are required to inform the **French National Registration Committee** in writing of any changes in their professional and personal circumstances which are relevant to their registration.

Conditions for Registration on the French Society list of Toxicologists

For the first application for registration;

- The candidate must show proof of his or her training in Toxicology (e.g. diploma, training period, etc.) a short Curriculum Vitae and a list of publications and work, and a certificate of employment in one field of toxicology, from the employer. A diploma or degree to be acceptable will probably have been obtained in the UK, USA, Japan, France or elsewhere in Western European countries, It is only acceptable provided it gives all guarantees and is widely recognized.
- The candidate must have worked in toxicology for at least five years, and must be employed in toxicology at the time of his or her registration.
- The registration on the list of Toxicologists implies a commitment from the candidate to respect the ethical principles and rules of the French Society of Toxicology. (a police record is requested)
- If this moral agreement is not respected, this may cause the candidate's registration to be invalidated.)
- It is essential and desirable for the candidate to put forward the names of at least two referees who can attest to the personal and professional qualifications of the candidate's chosen fields of toxicology in respect of his or her application.
- A charge of 600 FF will be made for each registration accepted onto the French Register. Members of the French Society will receive a subsidy of 150 FF. Thus, a charge of only 450 FF will be made.
- Registration fees are payable at the time of application, by cheque or credit card only, and no refund will be given, even in the case of refused or invalidated applications.

There will be meeting of the French Registration Commission at least every four months to review applications. Results will be sent to the candidate within 30 days of any given meeting.

A complete list of the French Society's registered toxicologists will be published at the end of each year. The list will be sent free of charge to all registered toxicologists on the list, and to any organizations requesting it.

Each registered toxicologist will receive a registration certificate, signed by all members of the **French National Registration Committee**.

The **French National Registration Committee** recommends that National Register candidates request information before making their application if they have less than the five years minimum experience required to register.

Candidates must agree to all terms and conditions as specified by the **French National Registration Committee**.

Right of Appeal

Should a candidate's registration be refused or cancelled, the candidate will have three months in which to appeal against decision to the **French National Registration Committee**.

In dealing with appeal cases, the **French National Registration Committee** will be assisted by a member of the EUROTOX Task Force acting in an individual capacity.

The EUROTOX Registration Task Force is composed by

Prof E. E. CREPPY	(France)
Dr. J.S.L. FOWLER	(UK)
Prof G.F. KAHL	(Germany)
Dr. T. HEINONEN	(Finland)
Dr- C. HODEL	(Switzerland)
Dr, H. M. TEMMINK	(The Netherlands)

Involvement of any of the above, in matters concerning the French National Committee for Registration, is on an individual basis.

Where refusal or invalidation of registration occurs, the candidate may renew his or her application in future years, having satisfied all the conditions of registration. Where these conditions refer to training or practice, it is essential that the candidate obtain the training or practice before re-applying.

Legal Meaning

The title "Registered Toxicologist" is conferred on someone who fulfills the criteria established for the profession at the national levels. The title encompasses quality and competence and is recognized by EUROTOX . The French Society attributes a high scientific value to the title.

The French Society Register of Toxicologists is submitted to EUROTOX on a regular basis. EUROTOX, the single overarching body for Toxicologists in Europe and registered in Zurich, has undertaken to publish the French list, together with other lists from qualifying nations.

Personal information contained in a registration applications will be treated in accordance with the specific French laws no. 78-17 of January 1978 and international regulation in relation to individual liberty and computerized information files.

Korean Board of Toxicology

Backgrounds

-growing interests among general population in Korea regarding endocrine disruptor, environmental pollution, pesticide contamination on food and agricultural products, occupational diseases, poisoning and other toxicity related incidences.

-Difficulties in identifying who is right person to get answer for the problem. Sometimes, many scientist who may not have proper toxicology training, appeared in the mass media and talked about pollution, risk assessment, and toxic out.

growing number of law suit against toxicity related incidences but few experts to give opinion.

-Korea as a member of OECD, joined Mutual Joint Visiting program for GLP monitoring. This year June, Monitoring team consisted of Japan, Australia, Hungary will monitor Korean GLP system.

-Therefore, the Korean Society of Toxicology and the Korean Environmental Mutagen Society decided to establish the Korean Board of Toxicology.

Objectives

- to establish standards for profession toxicology practice
- to promote the science of toxicology.

History

-In January 1999, the board of trustee of Korean Society of Toxicology and the Korean Environmental Mutagen Society appointed Dr. Boo Young Kim as chairman of committee for Education and Certification. He again recommended 9 members to the Board including Il Je Yu, certified by ABT at 1997, and Dr. Hyung Jin Kim, certified by Japanese Board of Toxicology, at 1998.

-In Feb 26, 1999, the committee discussed about the scope of certification, and eligibility of certification, and schedule of certification. The committee decided to initiate the certification from 1999. And Dr. Il Je Yu and Dr. Hyung Jin Kim were assigned to study American and Japanese certification program to be modeled.

-In March 19, 1999, 2nd committee meeting, eligibility requirement was discussed extensively. Finally consensus was reached that the first toxicology expert was selected without written examination to set up grandfather.

-In June 17 1999, The board of trustee of the Korean Society of Toxicology and the Korean Environmental Mutagen Society approved the draft and the schedule.

- Application deadline was set to Aug 31, 1999.

-The committee started from September 14, 1999 to screen the applications from 120 candidates, and the candidates were classified to 3 levels, Pass, Pending, and Fail. The

2nd review was conducted at Oct 6, 1999 and approximately 80 toxicologist candidates were selected and reported to the board of trustee of the Korean Society of Toxicology and the Korean Environmental Mutagen Society.

- On November 11, 1999, Annual Symposium of the Korean Society of Toxicology and the Korean Environmental Mutagen Society, the President of KST Dr. Young Soon Lee and chairman of the Korean Board of Toxicology Dr. Boo young Kim granted certification of Korean Board of Toxicology to 83 toxicology experts.

Eligibility requirement

The proposed eligibility standards were 1) candidate should have PhD or equivalent, 2) current and former society officers and who are recognized as an experienced toxicologist in academia or industry or research institution with high ranking. What is assistant professor or higher in academic position, Principal investigator in research institution. In addition minimum 10 year experience in toxicology.

Prospectives

Although the Korean Board of Toxicology started from last year, we have many difficulties to overcome. The certification does not have any regulatory support in Korea. Unlike many other certification such as engineering, or technology certificate, toxicology certification is not official certification supported by government. Many scientist doubt what is benefit for certification. Further we need to solve many tasks to improve our certification mechanism. First we need to develop a mechanism to review applicant eligibility. This harmonization meeting will help to balance our eligibility requirement with other countries. Second we need to develop certification exam such as exam category, and exam format to evaluate candidate objectively. Third, we need to develop certification maintenance program and re-certification program to promote science and to upgrade quality of certificate holders, Finally we need to keep collaborate with other certifying organization to improve our certifying skills.