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FINAL REPORT

TRAINING COURSE ON THE INDUSTRIAL APPLICATIONS OF STRUCTURE-BASED
MOLECULAR DESIGN AND COMBINATORIAL CHEMISTRY
UNIVERSITY OF MALAYA, KUALA LUMPUR
JULY 28 -AUGUST 8 1997

OBJECTIVE

Molecular Modeling and Combinatorial Chemistry are unanimously considered as powerful tools for the development of a country's capabilities in pharmaceuticals, agrochemistry and new material/chemical industries. These capabilities are necessary in order to give developing countries the possibility of market competition. Furthermore, many developing countries have large potentials in terms of their natural resources which can be better developed using the technologies of structure-based molecular design and combinatorial chemistry. Therefore, the objectives of this training course are:

- ◆ to provide scientists and technologists participating in this course with the basic information and an up-to-date knowledge of the principles and fundamentals of structure-based molecular design and combinatorial chemistry and their applications in drug/material designs and synthesis. This would enable scientists and technologists from developing countries to apply such techniques in their respective areas resulting in lower investments and reduced development time,
- ◆ to identify regional R&D institutions in developing countries through contacts established with the participants in the training course,
- ◆ to give ICS the opportunity in identifying qualified centres to be considered for inclusion as focal points in the ICS Network.

VENUE AND DATE

The training course was held for two weeks, from July 28th to August 8th 1997. The first half of the training course was held at the CAD/CAM Centre, Faculty of Engineering, University of Malaya, Kuala Lumpur while the second half was held at the University Malaya Computer Service Centre. These centres were chosen due to the facilities that are required for the training course. Twenty five SGI workstations were made available by the CAD/CAM Centre while twenty Pentiums were provided by the Computer Service Centre for the purpose of the training course.

ORGANIZATION

The training course was jointly organised by the International Centre for Science and High Technology and the University of Malaya. The latter assumed the responsibility as the contractor and hosting institution. The local organising committee who are members of the University of Malaya constituted as follows:

Professor A. Hamid A. Hadi (Advisor)
Associate Professor Rauzah Hashim (Chairperson)
Associate Professor Noorsaadah Abd. Rahman (Secretariat)
Associate Professor Kamaliah Mahmood (Honorary Treasurer)
Associate Professor Chen Wei (Flight and Accommodation)
Dr. Sharifuddin Mohd. Zain (Technical)
Dr. Ibrahim Noorbachta (Publication)
Associate Professor Zainudin Arifin (Social)
Mrs. Siti Puzlinda Salamat (Secretarial Assistant)

The organising committee operated following the guidelines and regulations specified by members of the Scientific Committee at the Scientific Planning and Co-ordination Meeting (SPCM) held at the International Centre of Science and High Technology (ICS) held in January 1997. The following persons constituted the Scientific Committee for this training course:

Professor Stanislav Miertus (ICS, Trieste, Italy)
Associate Professor Rauzah Hashim (University of Malaya, Kuala Lumpur, Malaysia)
Dr. G. Maggiora (Pharmacia & Upjohn, Kalamazoo, USA)
Dr. Radhey L. Singhal (Ranbaxy, New Delhi, India)
Dr. Vladimir Frecer (SAS, Bratislava, Slovakia Republic).

FUNDING

The training course was fully sponsored by ICS-UNIDO. Their contribution for the activity was USD 40000. The University of Malaya contributed by providing the premises for holding lectures and laboratories for hands-on session and facilities in terms of hardwares and audio-visual instruments. The CAD/CAM Centre provided 25 SGI INDY workstations at a subsidised rate of RM 2 000 while 20 Pentiums was provided by the Computer Centre without any fees. Technical support was provided by the staff of the CAD/CAM centre, Computer Centre, University of Malaya, Sime Darby Systems Malaysia and Silicon Graphics (M) Ltd while software support was provided by MSI and the Oxford Modeling Group. Full detail of expenditure for the training course is attached as Annex 1.

LECTURERS

A total of 16 lecturers were involved in training the participants in the area of structure-based molecular design and combinatorial chemistry. The origin of the lecturers is summarised in Table 1.

Table 1: Lecturer's Country of Origin

Country	No. of Lecturers
USA	2
Italy	3
Slovakia	1
Slovenia	1
Malaysia	7
India	1
Australia	1

Lecturers were selected from both the industries and academic institutions. Since the participants are from a diverse scientific background, the lectures from the academic institutions were asked to deliver lectures on fundamental topics. This is done in the hope that the participants will be able to accustom themselves with the topics that are being covered so that they will be able to integrate and tie the new materials of the application of structure-based molecular design (SBMD) and combinatorial chemistry (CC) to their research work. In addition, lecturers from the industries and research centres were asked to provide case studies and examples from the industries where such techniques are being used. By doing so, it is believed that a more complete view, ranging from fundamentals to applied research to industrial application would be given. The lecturer's institutional distribution is shown in Table 2.

Table 2: Lecturer's Institutional Distribution

Country	No. of Lecturers
Universities	9
Research Centres	3
Industries	4

A complete list of lecturers is attached in Annex II.

PARTICIPANTS

Calls for application were done through circulation of flyers to institutions in developing countries all over the world. The selection of participants were made by ICS through evaluation of the application forms and the *Curricula Vitae* submitted by the candidates. All of the participants were either academic members and reserachers of the universities or researchers and technologists of industrial and applied research institutions. 25 participants were chosen taken into consideration their region of origin as well as their institution. The ratio of participants from the academic institutions to industry/research centres (applied based) is close to 1:1. Tables 3 and 4 show the geographical and institutional distribution of participants, respectively.

Table 3: Geographical Distribution of Participants

Country	Number of Participants
India	10
Hong Kong	1
Philippines	1
Malaysia	11
Egypt	2

Table 4: Institutional Distribution of Participants

Institution	Number of Participants
Academic	12
Research Centres	3
Industries	9

15 candidates were chosen to be fully sponsored by ICS-UNIDO. This means that the airfare, living allowances and accommodation was fully paid for. Those present (participants, lecturers and organisers) were provided with lunches, morning and afternoon teas throughout the training course. No registration fees were requested from any of the participants. Although 25 candidates were originally chosen to participate in the training course, finally 23 candidates turned up to participate at the training course.

The comprehensive list of participants and the institutions they come from is attached as Annex III.

Fully sponsored participants were accommodated at the Heritage Hotel in Kuala Lumpur which is about 5 km away from the University of Malaya. This hotel was chosen due to its central location. The hotel accommodation included breakfast which is served before the participants leave for the University. For the convenience of the participants transport to and from the University were provided for the participants, whenever possible. On days that transport from the hotel to the University were not available, participant were requested to take the commuter train to the nearest station to the University. Arrangements were made for pick-up of the participants from this station to the University.

MATERIAL DISTRIBUTED

Participants were provided with a bag consisting of the usual training course materials which include the programme, list of participants/lecturers/organising committee as well as hard copies of the lectures. A copy of the material distributed to the participants is enclosed in this report. Dr. David Gallagher from the Oxford Molecular Group provided each participant with a copy of CACHE Modeling CD version 2.1 to take back to their respective institutions for demonstration regarding the use of computational techniques to other members of their institutions. A booklet of the complete lecture materials handed out to the participant is enclosed.

PROGRAMME

Opening Ceremony

The training course was officially officiated by the Vice-Chancellor of the University of Malaya, Tan Sri Dato' Dr. Hj. Abdullah Sanusi Ahmad. The opening ceremony was held on the 28th July 1997 from 9:30 am to 11:00 am at the Rumah Universiti, University of Malaya. The programme for the Opening Ceremony was as follows:

- 9:45: Arrival of the Vice-Chancellor
- 9:55: Opening Remarks by Associate Professor Rauzah Hashim
- 10:10: Introduction to Activities of ICS-UNIDO by Professor Stanilav Miertus
- 10:30: Opening Speech by the Vice-Chancellor
- 10:45: Tea Break

Several reporters from within and outside the University were present at the opening ceremony. Report of this event will be published in the next issue of the *Berita UM*, the official newsletter for the University. *Budiman* and *Bulletin Kejuruteraan Komputer*, two latter newsletters will be reporting special edition of this event in their

later edition. Some pictures covering this event is enclosed in Annex IV.

Training Course Programme

A total of 33 hours lectures and 30 hours of hands-on training session were given at the course.

Lectures

Each lecture is designed for 45 minutes. The lectures were held mostly in the CAD/CAM Laboratories mainly due to the fact that most of the lecturers used the workstation to demonstrate the application of techniques. An extra 15 minutes were reserved for question and answer session at the end of each lecture.

Laboratory (Hands-on) Session.

The laboratory sessions were for 2 hours each with at least two lecturers involve in training the participants on the computer. Hands-on training session were done on SGI INDY workstation for 7 days and Pentium for 2 days of the course. For this session, each participant had access to one SGI INDY workstation while they were obliged to share one Pentium with another person due to the constraint of the CACHE software available.

A detailed programme is enclosed in Annex V.

VISITS

Three visits were carried out during the course:

- **United Nations Development Programme (UNDP)**

A meeting was held between Mr. Neil Buhne, Deputy Regional Representative and Dr. Selva Ramachandran, National Program Officer from UNDP with Professor Miertus and Associate Prof. Dr. Rauzah Hashim. The discussion carried out in order to:

- explore the activities of both organisations, i.e. UNDP and ICS-UNIDO;
- identify overlapping areas of activities in Malaysia;
- explore the possibilities of future co-operation on Projects in Malaysia.

- **Standards and Industrial Research Institute Malaysia (SIRIM) Ltd.**

SIRIM is a government's corporate organisation with multitude activities. Amongst its activities is making sure that the standards set for Malaysian industries comply with the standards set by the International Organisation for Standardisation. SIRIM also performs industrial research to help improve the productivity of small/medium industries (SMI's) in Malaysia.

10 delegates from the training course was chosen for the visit to SIRIM Ltd. Considering the role of SIRIM in Malaysian industries, these delegates consists of mainly participants from the industries. The delegation, led by Professor Miertus, consists of the following persons: Associate Professor Rauzah Hashim, Dr. Sharifuddin Mohd. Zain, Dr. Vladimir Frecer, Dr. Giorgio Fassina, Dr. Janez Mavri, Dr. D.K. Dikshit, Dr. C. S. Choxi, Dr. S.K. Agarwal and Dr. Yenamandra Prabhakar. The delegates were warmly welcomed by Dr. Mohd. Shazali Othman, the Vice President of Engineering Services, SIRIM. During the visit, the delegates were first presented with the corporate video of SIRIM, Ltd followed by briefings by Dr. Mohd. Shazali on the role of SIRIM and by Dr. Zainal Abidin Yusuf, the General Manager of Chemical and Industrial Biotechnology Division. The delegates were also taken to the SIRIM's Exhibition Centre where the results of its activities were being exhibited. The delegates, mainly from the industries were very enthusiastic over the activities carried out in SIRIM. This led to a friendly and lively discussion between these delegates and some members of SIRIM, Ltd. Future links in some areas of research have also been implied.

- **National Scientific Council on Research and Development (MPKSN)**

MPKSN is a government agency equivalent to the National Science Foundation in the U.S.A or the SERC in Britain. One of its role is to ascertain that the direction of research taken by scientists and industrialists is in line with the government's policy and vision. It provides inputs for science and technology policies and develops programmes for their implementation. MPKSN is also responsible for strengthening the nation's technological base through enhancement of R&D activities, promotion of science and formulation of comprehensive action plan for technological development. Due to this fact, delegates chosen for this visit consists of members from the local academic and research institutions. The delegates, Associate Professor Rauzah Hashim, Dr. Khozirah Shaari, Dr. Normisah Mohamad, Associate Professor Zuriati Zakaria, Dr. Amir Feisal Merican and Dr. Awang Bono, was led by Professor Miertus to a discussion with the Director of Science and Technology Division, Professor Ishak Ismail.

Professor Miertus was interested in exploring the structure of the organisation and express the support for the setting up a focal point of activities which coincides with the wish of the delegates, i.e. to set up the National Computer-Aided Molecular Design (CAMD) Centre with biological, material and chemical applications. The delegates proposed to use such centre for high-level man-power training and reserach centre in order that the modeling and simulation technology being transferred effectetively into the country and widely applied in the industries.

As a result of the discussion, Professor Ishak was able to suggest several mechanisms for setting up such centre including "top-down initiations" which may include the participation of ICS-UNIDO.

SOCIAL EVENTS

Several social events were organised to achieve better integration and enable a more informal discussions between participants and lecturers. The social events organised were:

- * a barbecue and steam-boat dinner at the lakeside Nelayan Restaurant, Shah Alam (some participants had the opportunity to visit the Shah Alam Mosque prior to the dinner).
- * Kuala Lumpur Country Tour on Saturday afternoon, 2/8/1997.
- * Malacca Historical City Tour, a city about 200 km away from Kuala Lumpur on Sunday, 3/8/1997.
- * A lunch picnic at the University's botanical garden, the *Rimba Ilmu* (The Forest of Knowledge).
- * Local food and fruits lunch.
- * Special dinners for the lecturers and organisers.
- * A canopy walk and tour of the Forest Research Institute, Malaysia (FRIM) was organised for the participants who remained behind for a couple of days after the training course.

All the above events (except for the Malacca City Tour) were fully funded by the local organising committee.

RESULT

The training course has succeeded in its objective to create awareness amongst the participants regarding the application of SBMD and CC in their research work and in industrial application. The course was also able to provide better interactions between scientists and industrialist in developing countries. It is hoped that the network and co-operation formed during this course will continue to develop, particularly in promoting the inter-disciplinary field of SBMD and CC in research and the industries.

FEED BACK

Reactions to the scientific contents and general organisation of the training course was sought by means of an anonymous and optional questionnaire distributed to the participants. Lecturers were not asked to give any evaluation regarding the training course since most of them did not stay throughout the whole two weeks of the course. 19 questionnaires representing 80% of participants were returned. A questionnaire template is attached in Annex VI. In general, participants were happy with the course content and general organisation of the training course and all of them feel that this course have benefited them in one way or another. Most of the participants will be going back to their respective institution and try to encourage their colleagues in using more of these techniques in their research. Participants also felt that the organisation of the programme was good, in particular to the organiser's response to the participant's need. All the responses received stated that they would encourage members of their institution to attend similar activities in the future.

Most participants feel that a two week course is a just right to cover the lecture materials. Some feel that this duration is too short since there are too many materials that need to be covered in too short a time span. Others feel that two weeks is a little too long since they feel that their concentration span begin to dwindle after one week. Most participants would like the course for combinatorial chemistry and structure-based molecular design be separated. They feel this will make the course much easier for them to follow and understand. Participants would like to have more time should be spend on laboratory or hands-on training since they feel that this will provide them with the experience and feel of the techniques and is the most beneficial part of the course.

A summary of the evaluation of the questionnaire is attached as Annex VII.

SUGGESTIONS AND COMMENTS

A few suggestions given by the participants sounded valid and if possible, should be looked into further:

1. Most participants suggested that the course be divided into two parts rather than be offered all in one go; i.e., one training course dedicated towards structure-based molecular design and another dedicated only for combinatorial chemistry. In this way, topics covered could be more comprehensive, given the length of two weeks for the course. Many participants suggested that laboratory training on combinatorial techniques should be included, which will be however the main topic of the Training Course in Naples this September.
2. Another suggestion that may be useful to adapt is to separate the two courses offered by a week or two, i.e., giving a week or two break between the two different topics offered in the course. This way, more participants from the industries will be able to attend. One reason given by the industries in the ASEAN region for not being able to attend is that two weeks is too long for them to leave their work place. If the courses offered were broken up into two parts, they could send in two different scientists or researches to take part in the training course without any expense to their company.
3. Some participants suggested that the fundamental topics be omitted from the course. This is, however, not feasible given the diverse background of the participants attending the course.

ANNEX 1**FINANCIAL REPORT**

		RM	RM
	INCOME		
	Total receipt		106,010
	UNIDO 1 (32,000 USD)	80,510	
	UNIDO 2 (8,000 USD) (estimate)	20,000	
	Sime-Darby System and SGI (M) Ltd.	5,000	
	Bibi-Saintifik	500	
	EXPENDITURE		
	Total Expenditure		105,959.39
	Airfare	39,571.55	
	Local transport	5,241.80	
	Hotel	16,200	
	Per Diem and daily expenses	15,294.04	
	Printing	4,870	
	Mails and faxes	1,860	
	Rental	2,000	
	Administration and clerical	10,400	
	Incidentals	6,123	
	Honorarium	4,400	
	BALANCE		51.61

Note:

1. The local organiser received a total cash of RM106,010 (estimated), of which mostly was ICS-UNIDO's contribution. University of Malaya provided the facilities (the SGI-Lab and the Pentium Lab) at a very minimal charge to cover for the technical staff overtime.

2. The distribution of expenditure is shown in the table, Over 40% of expenditure was used to cover airfare, accomodation and per diems for sponsored participants and lecturers (from oversea). Daily expenses (about 10%) include cost of morning and afternoon teas, participants stationeries lunches, visits and social events both for lecturers and participants.

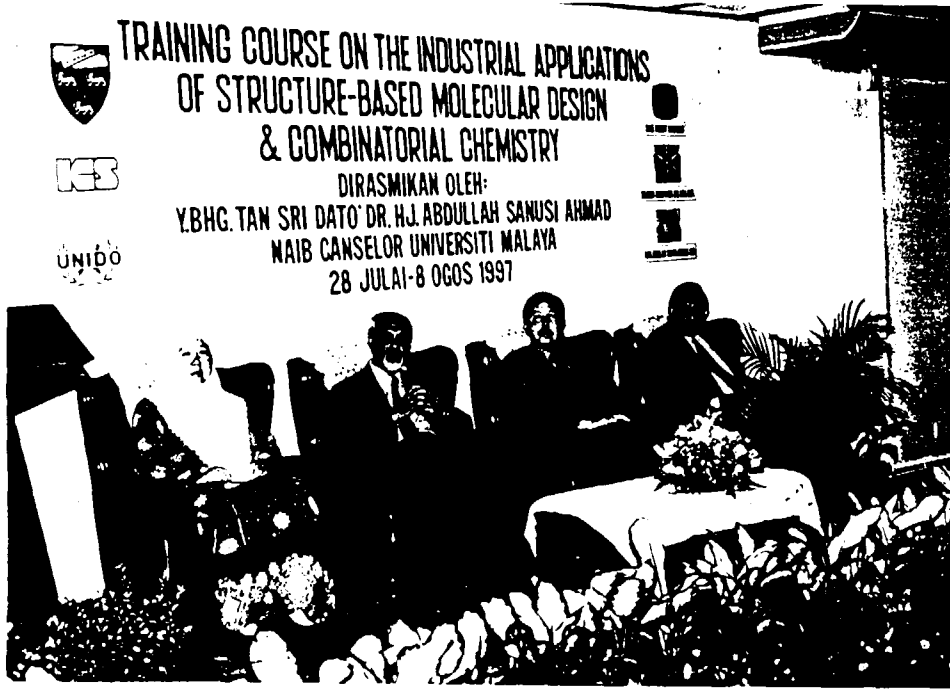
3. Apart from cash support, the organiser also received substantial technical help from MSI, Oxford Molecular Group, Sime-Darby System (M) Ltd. and Silicon Graphic (M) Ltd. The two software companies also provided for the two lecturers who attended the course while the organiser provided for their local expenses.

Annex II

List of Lecturers:

<p>Professor Miertus Associate Area Coordinator International Centre for Science and High Technology Pure and Applied Chemistry Via Grignano 9-34014, Trieste, Italy Fax: 0039-40-224-575</p>	<p>Dr. Sharifuddin Mohd. Zain Dept. Of Chemistry University of Malaya 50603, Kuala Lumpur, Malaysia Fax: (603) 759-4193 e-mail:zain@kimia.um.edu.my</p>
<p>Dr. Annaliese Palmer Molecular Simulations B2/4 Glen Street Milsons Point NSW 2061, Australia Fax: 61-2-9954 4388 email: liese@msi.com</p>	<p>Associate Professor Dr. Onn Hashim Department of Biochemistry University of Malaya 50603, Kuala Lumpur, Malaysia Fax: (603) 755-7740</p>
<p>Dr. Susanna Monti ICQEM-CNR Ins. Di Chimica Quantistica ed Energetica Molecolare, Risorgimento 35 56126 Pisa, Italy e-mail:susanna@hulk.icqem.pi.cnr.it FAX +39-50-502270</p>	<p>Associate Professor Dr. Wan Ahmad Tajuddin Department of Physics University of Malaya 50603, Kuala Lumpur, Malaysia Fax: (603) 759-4146</p>
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<p>Dr. Vladimir Frecer POLY-BIOS Research Centre Area Science Park I-34012 Trieste, Italy Fax: 39-40 922 0016 e-mail:Vlado@gloria.icc.trieste.it</p>	<p>Associate Professor Dr. Rauzah Hashim (Lab Sessions) Department of Chemistry University of Malaya 50603 Kuala Lumpur, Malaysia e-mail: rauzah@kimia.um.edu.my Fax: (603)-759-4193</p>
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Annex V

	9:00 - 9:45	10:00 - 10:45		11:15 - 12:00	12:00 - 13:00		14:30 - 15:15	15:15 - 16:15		16:45 - 17:30	17:30 - 18:30
Mon. 28/7	Opening Ceremony (including morning tea)			Introduction to SBMD and CC Prof. S. Miertus	Lunch		L5, L6: Molecular Diversity and Similarity; Molecular Recognition Dr. K. Smith	Tea	L3,L4,L5: Intro. To CC & CC Tech. Biological. Assay and Economic Aspects of CC. Dr. R.L. Singhal		
Tues. 29/7	L1, L2 : Handling of Workstation (SGI), Intro. to Info. Tech. (UNIX) and Lab. Session Dr. Sharifuddin, Dr. Noorsaadah		Tea	L8: Introduction to Molecular Modeling Dr. A. Palmer	L9: X-Ray Crystallography Dr. Chen Wei	Lunch	LAB: P1: Intro. To Molecular Modeling and CC Dr. A. Palmer, Dr. Noorsaadah, Dr. Rauzah, Dr. Smith		Tea	LAB: P2, P3: Molecular Graphics Structure and Stereochemistry Dr. A. Palmer, Dr. V. Frecer, Dr. Noorsaadah, Dr. Sharifuddin	
Wed. 30/7	LAB: P4: Similarity and Diversity Descriptors Dr. K. Smith, Dr. Noorsaadah, Dr. Sharifuddin, Dr. Rauzah		Tea	L10: Physical Basis for Modeling Dr. A. Palmer	L11: Conformational Searching Dr. A. Palmer	Lunch	L12: Quantum Mechanics I (Principles) Dr. Sharifuddin	L13: Molecular Dynamics/Mech Dr. A. Palmer, Dr. Noorsaadah	Tea	L14: Protein Chem. And Enzyme Funct. Dr. Onn Hashim	
Thurs. 31/7	L15: Quantum Mechanics II (Application) Dr. J. Mavri	L16: Docking, Structure-Based Molec. Design Dr. A. Palmer	Tea	LAB: P5, P6: PDB, 3-D Database; Building Macromolecules Dr. A. Palmer, Dr. Noorsaadah, Dr. Rauzah		Lunch	Free Programme				
Fri. 1/8	L17: Neural Network Dr. Wan Ahmad Tajuddin	L18: Molecular Bioavailability Prediction Dr. V. Frecer	Tea	L19: <i>Ab Initio</i> , <i>Semi-Empirical</i> and <i>MM</i> Dr. Ibrahim	Lunch Break (Friday Prayers for Muslims)		LAB: P7: Application of Molecular Orbital in SBMD Dr. K. Smith, Dr. Sharifuddin		Tea	LAB: P8 + P9: QM/MM Free Energy Perturbation Theory Dr. J. Mavri, Dr. Ibrahim	
Sat. 2/8	9:30 am – 12:30 pm Individual Training Session Dr. Monti, Dr. Rauzah, Dr. Noorsaadah, Dr. Sharifuddin, Dr. Smith				KL Country Site Tour Bus Pick Up at Hotel Lobby at 1:45 pm						
Sun. 3/8	Free Programme Tour Outside Kuala Lumpur										
Mon. 4/8	L20, L21, L22: Overview Application of Combinatorial Methods in Biom. Ind. Research Dr. G. Fassina		Tea	L23: Protein Homology and Model Building Dr. S. Monti		Lunch	L24, L25: Methods in Library Generation and Screening (Chem. and Biol. Application) Dr. G. Fassina		Tea	LAB: P10: Application of SBMD in 3-D QSAR Dr. S. Monti, Dr. Noorsaadah, Dr. Rauzah, Dr. Frecer	
Tues. 5/8	L26: Application of Combinatorial Technology Industry in Biomedical Section (Case Study) Dr. G. Fassina		Tea	LAB: P11: Receptor 3-D Screening, Docking Dr. Monti, Dr. Noorsaadah, Dr. Sharifuddin, Dr. Rauzah		Lunch	LAB: P12: Application CC and CT in Chem. Industry (Case Study) Dr. G. Fassina, Dr. Rauzah, Dr. Noorsaadah, Dr. Sharifuddin		Tea	LAB: P13: Pharmaco. Generation and Validation Dr. Monti, Dr. Noorsaadah, Dr. Rauzah, Dr. Frecer	
Wed. 6/8	L27, L28: QSAR & QSPR (Lecture and Software Demo) Dr. D. Gallagher		Tea	LAB: P14: Application SBMD & CC in Ligand Design and Pharmaceutical Industry Prof. S. Miertus, Dr. V. Frecer		Lunch	LAB: P15: <i>De Novo</i> Protein Engineering Dr. S. Monti, Dr. Noorsaadah, Dr. Frecer		Tea	L29, L30: Predicting Chemical Properties, Visual of Reaction Dr. D. Gallagher	
Thurs. 7/8	L31: Chemical by Design Dr. D. Gallagher		Tea	LAB: P16: Chemical by Design (Session I) Dr. D. Gallagher, Dr. Sharifuddin, Dr. Noorsaadah, Dr. Ibrahim		Lunch	LAB: P17: Chemical by Design (Session II) Dr. D. Gallagher, Dr. Noorsaadah, Dr. Rauzah, Dr. Sharifuddin		Tea	E1: Evaluation of Programme Prof. S. Miertus	
Fri. 8/8	END OF PROGRAMME					Lunch	DEPARTURE OF PARTICIPANTS				

4. Any other suggestions for future improvements to the programme?
5. Do you think that the topics/tools you studied during the course could be used by industries in your country? If so, how? If not, why not?
6. Can you suggest any programme and future activities which ICS could pursue in order to help with the technological and scientific advancement of your country?
7. Do you think you have benefited from participation in this course/workshop? If so, how? And your institution?
8. How do you intend to disseminate the information you have acquired during the activity once back in your own country?

G. Evaluation of Lectures and Speakers

- | | | | | |
|--|------------------------------------|------------------------------------|-------------------------------|--------------------------|
| 1. Course materials
fair | <input type="checkbox"/> excellent | <input type="checkbox"/> very good | <input type="checkbox"/> good | <input type="checkbox"/> |
| 2. Resident Lecture Presentation
fair | <input type="checkbox"/> excellent | <input type="checkbox"/> very good | <input type="checkbox"/> good | <input type="checkbox"/> |
| 3. | | | | |
| 4. International Lecture Presentation
fair | <input type="checkbox"/> excellent | <input type="checkbox"/> very good | <input type="checkbox"/> good | <input type="checkbox"/> |
| 5. | | | | |
| 6. Ability of lecturers to answer specific questions
fair | <input type="checkbox"/> excellent | <input type="checkbox"/> very good | <input type="checkbox"/> good | <input type="checkbox"/> |

Any comments:

Thank you for your collaboration

Annex VII

Summary of Analysis of Evaluation:

A. Organisation:

A. ORGANISATION	Excellent (%)	Very Good (%)	Good (%)	Fair (%)
The information process	15	40	30	15
The announcement and pre-course material	0	28	39	22
I found the scientific programme	21	47	32	0
Applied Lecture/Workshop	21	42	32	5
Use of Small Working Group	17	33	44	5
Case Studies	5	53	42	0
The time spent by lecturers in class and after class on specific questions/examples	21	42	37	0
Organiser's response to participant's needs	32	32	37	0
Overall Programme Organisation	10	50	30	10

	Balanced (%)	Not Balanced (%)
Student scientific knowledge	60	40

B. Duration of Programme	Just Right (%)	Too Long (%)	Too Short (%)
Number of days	60	30	10
Length of working days	65	35	0

D. Training Facilities and Hotel	Excellent (%)	Very Good (%)	Good (%)	Fair (%)
Lecture/ Training Rooms	37	37	26	0
Breaks/Refreshments	25	50	15	10
Hotel Accommodation (Applicable to only 13 participants)	9	27	64	0
Meals at the Hotel (Applicable to only 13 participants)	0	15	54	31

	Yes (%)	Maybe (%)	No (%)
Would you recommend to others from your institution/country to attend a similar activity in the future	95	5	0

G. Evaluation of Lectures and Speakers	Excellent (%)	Very Good (%)	Good (%)	Fair (%)
Course Materials	30	45	25	0
Resident Lecture Presentation	15	45	40	0
International Lecture Presentation	20	60	20	0
Ability of lecturers to answer specific questions	21	68	11	0