European Society of Biomechanics
Newsletter
April 2003

Editor: Dr. Hans Van Oosterwyck Editorial Office: Division of Biomechanics and Engineering Design, K.U.Leuven, Celestijnenlaan 200A, 3001 Heverlee, Belgium E-mail: hans.vanoosterwyck@mech.kuleuven.ac.be

Newsletter Call for Participation!

Hans Van Oosterwyck, K.U.Leuven, Belgium

Newsletter editor

Dear ESB member,

As spring is arriving in Europe, we thought it might be the right time to introduce some novelties in this issue of the ESB Newsletter. First of all, we would like to start with two new columns. The first one is our "Speakers' Corner", that will allow our members to ventilate their thoughts, ideas and (critical) comments on biomechanics-related and ESB-related topics. As was already clearly stated by Patrick Prendergast in his President's Address in the previous issue of the Newsletter, we very much appreciate to hear about your suggestions, so that we can provide better services to our members. The Speakers' Corner could contribute to that goal. The second new column will deal with "Biomechanics in EC funded projects" and will inform you on the results of past EC-funded projects. Of course, both columns will only be successful if we have sufficient input. For that reason, you are kindly invited to contribute to one of these columns, so that we can have many 'lively' Newsletter issues. Do not hesitate to contact me or one of the Council members if you have some ideas. You will notice that also at other places in this Newsletter we explicitly call for your participation, e.g. for the newly founded ESB_Forum mailing list (p. 7) and for the EC Liaison Committee (p. 8). We really hope we can involve as many members as possible in the activities of the ESB. And of course, we hope you can find useful and stimulating information in this issue of the Newsletter!

Leuven, 19th March, 2003

SPEAKERS' CORNER

Personal Reflections on Biomechanics Research

J. Joachim Telega, Polish Academy of Sciences, Institute of Fundamental Technological Research, Warsaw, Poland

I was asked by the new President of the ESB, Prof. P. J. Prendergast and the Council Member Prof. J. Vander Sloten to write a note for the ESB Newsletter. I am grateful to both of them for their kind invitation.

My note will be somewhat critical. My point of view on biomechanics is that of a researcher accustomed to precise formulations of mechanical problems, including constitutive modelling.

I will first express my comments and suggestions pertaining to the ESB Conference. Obviously, I strongly appreciated the enormous efforts of the chairman of the past Conference, Prof. R. Będziński and of his team, who succeeded in organising a very enjoyable and memorable conference.

1. I think that the new President of the ESB and the Council should consider extending the programme of future ESB Conferences. Many possibilities come to mind. First of all, personally, I missed the participation of a significant group of clinicians.

They could provide two or three general lectures and several keynote lectures posing open problems, which would not be simply ordinary presentations. We also need courses on molecular biology for biomechanists and courses on tissue engineering. The problem is how to organize such a programme. The solution I propose is to cancel the "Precourse" and make the Conference one day longer. Another solution is to make ESB Conferences more specialized. This could be achieved by emphasising at each Conference different aspects of biomechanics, with limitations imposed on more traditional problems. During the Conference the participants have no time for free discussions. Everything is done in a hurry and many of us have also meetings to plan organization of cooperation, etc. To find more time, one could plan one day with lectures only until lunchtime, and the afternoon could be devoted to excursions and various meetings. Obviously, such a programme is possible, provided that the Conferences would be one day longer.

2. Somebody at the beginning of the past ESB Conference used the expression "perfect machines" for organisms. I am strongly against the use of such expressions, which go back to the French philosopher René Descartes (1596-1650). I should like to recall that the expression has a strongly negative ideological background. Also, I do not like the word "mechanobiology ". It's extremely imprecise. To support my point of view, imagine words like "mechanomathematics" or "physicomathematics". Terrible! We should use precise statements, for instance cell biomechanics. Anyway, I find that many biomechanical papers lack precision, in contrast, for instance, to good papers in solid and fluid mechanics.
3. I was surprised to hear some statements and conclusions pronounced by some speakers. They were just trivial. And the people spent a lot of time and money to come to such conclusions! I think that reviewers need to be more demanding.
4. I hoped to learn something about many exciting problems in biomechanics during the Conference. Unfortunately, I did not learn as much as I hoped. I mention just two examples: (i) what about replacing traditional joint implantation by cultured cartilage properly fixed to the subchondral bone?, (ii) are there new ideas for the improvement of filtration through kidneys, once they are attacked by until now incurable diseases (e.g. glomerulonephritis) that sooner or later lead to hemodialysis? Dialyses are extremely cumbersome and time-consuming for patients. Also, they cost a lot of money. In my opinion the classical system of dialysis needs a break-through. What is being done? It would be of great value to organise, during each ESB conference one session devoted exclusively to clinical and biomedical problems related to one organ (brain, heart, kidney, liver etc.). Obviously, such a session would necessarily be preceded by two keynote lectures: one by a clinician, the second one by a biomechanist.
5. Thinking of remodelling we most often think of bone remodelling, particularly after menopause or implantation. Soft tissue biomechanists know that there is an exciting problem of adaptation of soft tissues, like myocardium, arteries and veins to changing flow. During ESB conferences more attention should be paid to this type of soft tissue biomechanical problems of great clinical importance. For instance, consider complex problems related to arteriovenous anastomosis and fistula in persons requiring dialysis. Then, the systemic flow becomes strongly perturbed and sooner or later patients have serious problems with their cardiovascular systems and osteoporosis. What can biomechanists invent and suggest? The anastomosis and the fistula after shorter or longer time often pose serious biomechanical problems related to turbulent flow and their utility. Thus, there is a whole class of complex biomechanical problems, with major clinical relevance, requiring deeper biomechanical insight and modelling, including the search for new biomaterials. I think of biomaterials used for the replacement of fistula, after say, a few years of its exploitation (punctures).
6. I could provide a much longer list of topics for future ESB Conferences, so that Europe could more effectively compete with the USA and Japan in the field of biomechanics.

Now I pass to some observations and comments related to general aspects of biomechanics:

I. Often biomechanical papers give only descriptive, and not mathematical, formulations, though the latter would facilitate reading of the paper. Precise constitutive modelling, clear formulations of boundary and initial-value problems are rather scarce. Currently typically biological, descriptive methodology prevails. Biomechanics is a younger sister of applied mechanics and therefore should definitely learn from her older sister.

II. Constitutive modelling proposed by biomechanists is sometimes unacceptable since basic, established requirements are not fulfilled. An example related to soft tissue modelling has been provided by S. Jemioło and myself (Modelling elastic behaviour of soft tissues. Part II Transverse isotropy, Engineering Transactions, 49, 241-281, 2001; Transversely isotropic materials undergoing large deformations and application to modelling of soft tissues, Mech. Res. Commun., 29, 397-404, 2001). We proved that

on the basis of available experimental data the stored energy function, for a certain range of physiological deformations, is negative (perpetuum mobile!). We have also shown that some oversimplified constitutive models are erroneous.

III. I appeal to researchers performing experimental tests to present their results in a lucid and legible manner so that theoretically minded colleagues could use them in constitutive modelling. Perfect curve fitting is usually of no value for theoreticians.

IV. Biomechanics becomes more and more interdisciplinary and difficult to be well understood by a single mind. It seems that biomechanists easier assimilate the ideas coming from biology and biophysics than from now enormously developed applied mechanics, particularly nonlinear one. The reason is simple: the latter requires good knowledge of continuum mechanics (now also molecular mechanics) and appropriate - often advanced - mathematical methods.

My reflections are critical. Yet, I have always been strongly convinced that a conscious researcher should be critical and self-critical as well as enthusiastic. Biomechanics is fascinating.

Editorial note: We appreciated the fact that prof. Telega wanted to share his ideas on biomechanical research with us. Moreover, we think that the contribution of prof. Telega could be the start of an open discussion on the aspects, addressed by him. We would like to encourage all our ESB members to take part in this discussion. At the same time, this could be a nice occasion to inaugurate our new ESB_Forum mailing list (see p. 7), which will be the ideal platform for such a discussion. Let us know what you think about his ideas, and post your comments to the mailing list by sending an e-mail to esb_forum@yahoogroups.com (but first make sure that you are subscribed to the list!). In the next issue of the Newsletter we will present an overview of all the posted messages.

BIOMECHANICS IN EC FUNDED PROJECTS

Towards Pre-clinical Test Protocols for Cemented Femoral THA Implants

A European collaborative project of 6 scientific labs and 5 industrial partners

Nico Verdonschot, University of Nijmegen, The Netherlands
Patrick J. Prendergast, Trinity College Dublin, Ireland

Introduction

Although the survival rates of total hip arthroplasty (THA) prostheses is very good (about 93% after 10 years), new designs are put on the market that sometimes prove to be disasters. Often these implants are very similar to already existing implants and it is not felt that extensive pre-clinical testing is really necessary. A recent example of an implant that produced high failure rates is the Capital Hip prosthesis (3M Health Care Ltd., Loughborough, UK) with a revision rate of 12% after 2.6 years. If these prostheses would have been tested before it was implanted in patients, the errors in the design could have been detected and a lot of human suffering and money could have been saved.

In 1996 we started a project to develop a set of tests that could identify inferior designs at a pre-clinical stage. For this purpose, a European consortium of orthopaedic research institutes and European orthopaedic companies was established with each specific tasks, separated into three stages (Fig. 1). The Project coordinator was Professor Rik Huiskes and we acted as technical field coordinators.

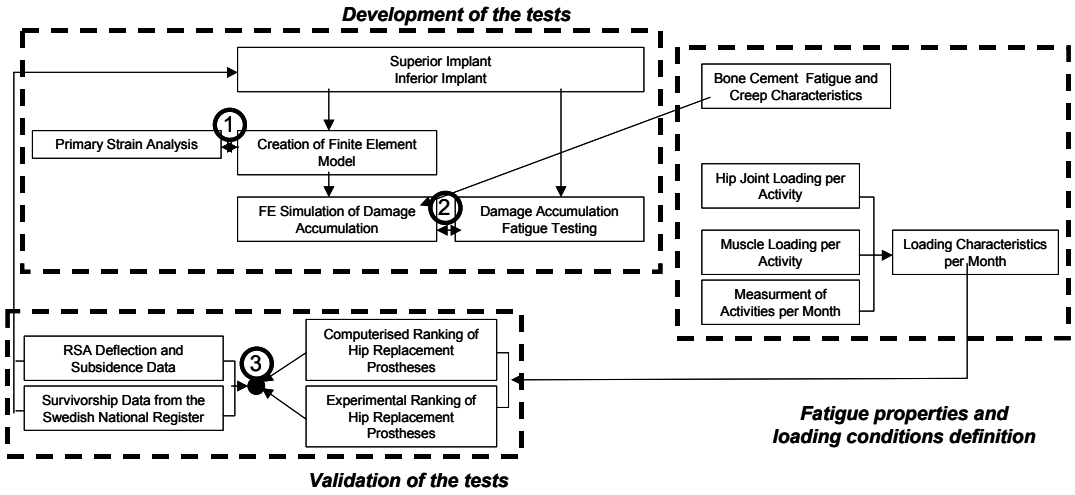

Figure 1: Schematic overview of the different stages in the project. Project milestones are indicated by 1,2, and 3.

Phase 1: Basic data

In the first stage, input data for the tests such as detailed loading conditions and material properties of the bone cement were created.

The loading conditions were determined by measuring contact forces in the hip joint with telemetric instrumented prostheses (Bergmann et al., Oskar Helene Heim, Biomechanics Laboratory, Berlin, Germany), These measurements were performed synchronously with motion analysis and EMG of patients and ground reaction forces. Data combined from all trials of four individuals were used to describe a 'typical' patient. Obviously patients perform many different activities and the actual loading conditions around the hip are very complex. This hampers the application of these data to pre-clinical tests. We analyzed the contact forces and moments around the hip and tried to categorize the different activities in only a limited number. It appeared that there were three activities that were distinctly different: normal walking, going upstairs and stumbling. The other activities produced contact forces and moments that were very similar to either normal walking or going upstairs. We were able to define loading regimes that were 'typical' and 'high demanding'. The latter may be used for pre-clinical testing of implants. The number of cycles these activities occur *in vivo* was measured on 34 THA patients during their normal life at home. The muscle forces around the hip were calculated using a musculoskeletal model (Duda and Heller et al., Charité, Humboldt University of Berlin, Germany; Morlock et al., T.U. Hamburg-Harburg, Germany). The model was validated by applying it to the four patients measured with the gait analysis system and the telemetric hip prostheses. We were able to simplify the muscle configuration to a level that would allow a hip joint loading simulator to be built and mimic the loading configurations.

The material properties of bone cement were determined using uni-axial fatigue experiments in which the accumulation of micro-cracks and the amount of creep were recorded (Prendergast and Murphy et al., Trinity College, Dublin, Ireland). However, the loading configuration in the cement mantle is very complex and certainly not uni-axial. We performed additional experiments whereby an additional stress level was applied perpendicular to the prime loading configuration. We found that the scatter in the data increased and that the life time decreased. The accumulation of damage was also experimentally assessed around femoral components with different surface finishes. It was found that the increase of micro-damage could indeed be confirmed in the models. In addition, it was found that the pre-existing damage governed the development of the micro-cracks.

Phase 2: Development of the protocols

In the second phase three tasks were fulfilled. The first task was to generate a protocol to assess the effects of different prosthetic designs and biological factors (bone remodelling and soft tissue development) on the strain distributions in the bone and cement mantle (Cristofolini et al., Laboratorio di Tecnologia Medica, Istituti Ortopedici Rizzoli, Bologna, Italy.). The protocol was applied to two stem types; one having a good clinical performance (Lubinus SPII stem) and one having a less favourable clinical performance (Mueller Curved stem). Significant different strain patterns for the two stem types were found. The common stress shielding effect was measured around both stems. Bone remodelling increased the stresses to more physiological levels, but stress shielding was still evident. A complete soft tissue layer around the cement mantle increased bone stresses. Bone resorption led to increased cement strains, particularly at the distal side.

The second task was to develop an experimental pre-clinical test. For this purpose an automated insertion jig was created which could implant stems in the bone

in a very reproducible way. A set of 6 LVDT's (Linear Variable Displacement Transducers) was connected to the prosthesis and femur in order to measure both the three-dimensional cyclic motion as well as the migration pattern. A dynamic load was applied to the femoral head and the motions of the stem relative to the bone were monitored. After the experiments the specimens were sectioned and analyzed for cement damage and stem-cement debonding. Despite the fact that we used an insertion rig, the migration patterns showed a great variation of prosthesis subsidence rates. However, on average the Mueller prosthesis subsided at a faster rate than the Lubinus; also the cyclic micro-motions seemed to increase for the Mueller design, whereas they decreased for the Lubinus SPII stem. The cross sections showed stem-cement debonding around both stems and more cement cracks around the Mueller Curved stem, particularly around the corners of the stem (fig. 2). Hence, the experiments separated the good from the bad implant by the amount of migration and the number of cement cracks found in the mantle.

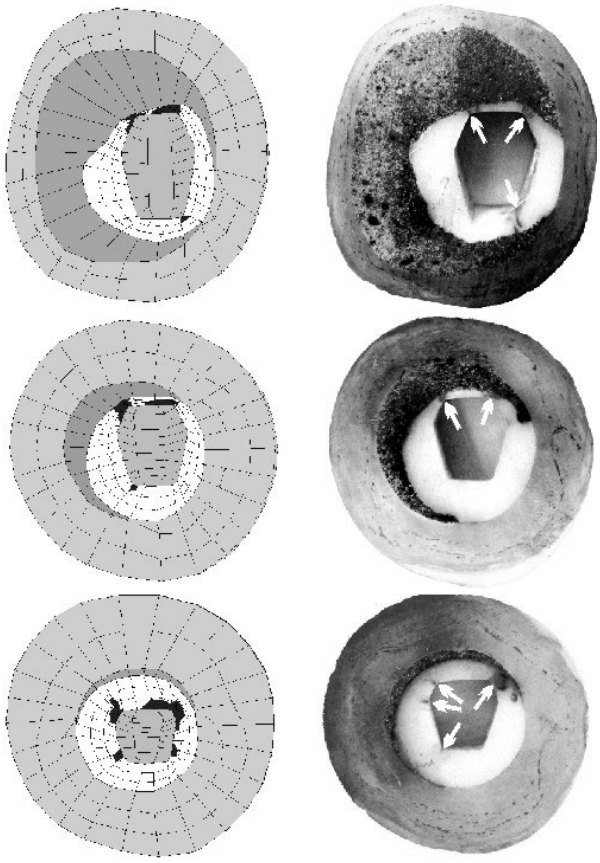

Figure 2: Crack locations in the cement mantle, as predicted by the finite element simulations after 20 million cycles (left) and as found in the experiments after 2 million cycles (right). The crack locations are shown for three levels along the stem. In the finite element cross-sections the cracked regions are the black regions in the white cement mantle. In the cross-sections of the experimental reconstructions, the crack locations are indicated by the arrows.

The third task was to generate finite element (FE) models and to implement a routine to simulate cement creep and cement damage with data generated during the first phase (Stolk, Verdonschot and Huiskes, University of Nijmegen, Nijmegen, The Netherlands). The strain distribution in the FE models were first extensively validated with the strain gauge measurements. Subsequently a simulation of the creep behaviour of bone cement and the accumulation of micro-damage in the cement mantle (as determined in phase 1) was incorporated in the FE code. In order to validate this simulation, the dynamic loading experiments of the two stem types were simulated. It was assumed that both stem types were not bonded to their cement mantles. The finite element models predicted the same phenomena as found in the experiments with more migration and more cement damage around the Mueller Curved (fig. 2). Hence, there was an excellent agreement between the locations where damage was produced in the experimental Mueller Curved reconstructions and in the finite element simulation for the Mueller Curved (Fig. 2).

Phase 3: Validation of the tests

In the third phase the computer simulation and experimental test protocols were applied to four stem types (Mueller Curved stem, the Lubinus SPII, the Exeter polished, and the Charnley Roundback.) of which the clinical survival is known from the Swedish Register (Malchau and Herberts et al., University of Göteborg, Institute of Surgical Sciences, Department of Orthopaedics, Göteborg, Sweden). For these simulations realistic loading configurations were applied as determined in the first phase of the project. It was determined whether the simulation and the experimental tests could predict the same ranking in terms of mechanical survival as found *in vivo*. If this were the case, a validated test program for cemented femoral stems could be formulated. The survival curves of the four implants, as reported in the Swedish Hip Register, are shown in figure 3.

The experimental tests produced a ranking based on migration as follows (from minor to most migration): (1) Charnley, (2) Lubinus, (3) Mueller, and (4) Exeter. When ranked using inducible displacement, the order was (1) Charnley, (2) Lubinus, (3) Exeter, and (4) Mueller. These results suggest that it may be possible to use migration data for stems designed to maintain bonded to the cement mantles (with profiles), but that the development of inducible displacements may provide a better basis for ranking prostheses (both those designed to stay bonded and those designed to debond).

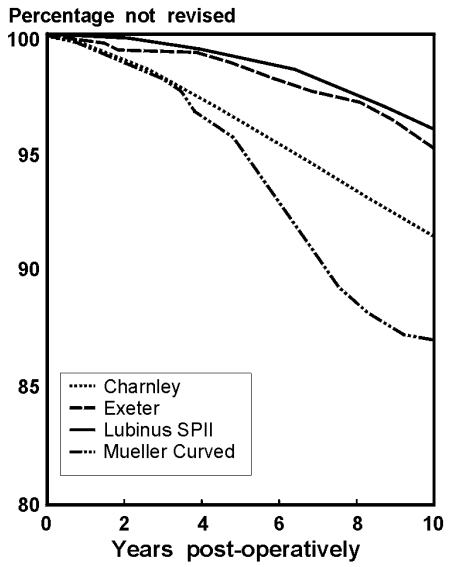

Figure 3: Survival data of the four stems investigated in this project.

The FE simulation predicted a survival ranking that was identical to that found clinically (fig. 3). The Mueller Curved stem produced a dramatically higher number of cement cracks than the other stems. The Charnley stem performed better than the Mueller Curved stem, but worse than the Exeter and the Lubinus SPII stems. The latter two were similar in the relatively low numbers of cracks produced. As also seen in the *in vitro* experiments, high stem migration did not correlate with high damage accumulation rates in the cement mantle. The Exeter stem showed the highest migration, but not the highest number of cement cracks.

Implementation

The work we have performed over the last 6 years is documented in many papers and reports to the EC. In addition, we have sent our work to the Technical Committee 285 of the European Normalizing Institute (CEN). This committee defines standard tests for orthopaedic implants. They are currently considering four proposals:

- *In vitro* migration measurement method for total hip replacement femoral components
- Method to perform strain gauge measurements to determine stress shielding in femurs implanted with a hip stem
- Finite element based prediction of mechanical failure of cemented femoral THA components
- Application of load profiles to test THA components

Of course, one should realize that these tests are never a guarantee for good *in vivo* service. The tests focus on a specific aspect of the reconstruction and do not cover all possible failure mechanisms. Nevertheless, we believe that if our proposals are accepted by the TC, they will certainly lead to a reduced number of inferior designs that are released on the market.

Acknowledgement

This project was sponsored by the EC and grants from our industrial partners: Aesculap AG, MITAB/Scandimed, Tecres, Waldemar Link GmBH & Co., Senterpuls.

ESB Council Report

Keita Ito, AO Research Institute, Switzerland

ESB Secretary-General

Over the weekend of January 24, 2003, ESB Council members made their way from throughout Europe to collect in the Dutch provincial city of Eindhoven. Although Eindhoven may be more commonly renown for its athletic (PSV Eindhoven) or industrial (Royal Philips Electronics NV) institutions, these were not the destinations. We gathered at the Eindhoven University of Technology (TU/e) to attend the ESB Council Meeting hosted by Prof. Frank Baaijens. The primary reason for having the meeting in Eindhoven was to discuss the upcoming 14th ESB conference, but we also wanted to take the opportunity to acquaint ourselves with the Biomedical Engineering Department.

Unlike North America, European universities have been more conservative in the formation of new interdisciplinary departments, favouring instead departments in the classical disciplines with interdepartmental collaborations. Although equally effective for research or post-graduate training, it can be well argued that interdisciplinary university degree programs benefit more from the former. For this reason, and some others, the TU/e established the department in 1999 after starting their educational program with the University of Maastricht in 1997, making this one of the first Biomedical Engineering departments and degree programs in Europe. Currently, the department takes in over 60 new

students per year and has ca. 55 graduate students and 35 faculty members. To my knowledge, this may be the largest biomedical engineering department in Europe! With such a background, it was not a surprise to see the expansive facilities encompassing a broad range of research activities.

Actually, it was precisely for this strength that last fall the Council awarded the organization of the next ESB conference to Prof. Baaijens and his departmental colleagues. And, we were not disappointed when he presented to us the conference structure. One of the goals for the conference will be to have presentations of the highest scientific calibre, from students to experienced scientists, covering the entire spectrum of biomechanics. To make such a conference, they have proposed to have six themes, including Tissue and Cellular Engineering, and each will be further divided into specific topic mini-symposia. They will strive to have a 50/50 mix of invited and freely submitted papers in each mini-symposium. The invited speakers will be encouraged to give presentations concerning their most current and exciting research results. Hopefully, this will also help to foster lively and constructive discussions with both converging and diverging opinions. We are excited by the potential for the next biannual conference, and are looking forward to seeing you there in 2004.

We would like to attract new outstanding young scientists, and established scientists, who have not yet joined the ESB

The biggest issue of having a strong membership is that of providing services that are valued by members.

In addition to ESB 2004, the council discussed normal business matters, and spent a considerable portion of the meeting on the issue of Society Membership. The Society's values, strengths and security are dependent on the membership. Hence it is in the interest of the Society to have a large, well represented, membership. To strive towards this goal, we would like to not only double our members from 300 to 600 by 2006, but also to attract new outstanding young scientists, and established scientists, who have not yet joined the ESB. Prof. Ralph Müller, our Membership Committee Chairman, has been spearheading this drive. He has brought much energy and enthusiasm to this task and proposed many interesting ideas, e.g. membership and conference fee restructuring, corporate members, fellows, affiliation with national societies, alliances, etc. Many of these were discussed in detail and tasks were assigned for further explorations.

However, to increase our members is much easier said than done. Membership is tied to many aspect of our Society and as such, any discussion of membership fosters discussions about other aspects, e.g. finances, affiliations with scientific journals, etc. Also, although it would be friendlier to be inclusive rather than exclusive, it would not serve the purposes of the Society to have little or no membership criteria. Finally, the biggest issue of having a strong membership is that of providing services that are valued by members. Some of the services discussed at this meeting were more convenient internet-based member services (e.g. information databases, administration, finances, etc) and focused workshop/summer school courses. Although many of us have our own personal views on current and future services, what are the views of our members? This goal will certainly require much work, but it will help to ensure the success of our Society, and we hope that you may help us in this task.

Eindhoven, 14th March, 2003

ESB_Forum mailing list

On March 12, the ESB_Forum mailing list was launched. From now on, it will be the official mailing list of the European Society of Biomechanics and it is part of a larger initiative of the ESB to promote electronic communication within the Society. By now, each ESB member should have received an e-mail to announce his or her automatic subscription to the mailing list, i.e. if the ESB has your updated e-mail address. If this is not the case, you are invited to become a member to the ESB_Forum mailing list, simply by sending an empty message to esb_forum-subscribe@yahoogroups.com. This will also allow us to update our information on ESB members' e-mail addresses. If for some reasons you do not want to be a member of the list, you can unsubscribe by sending an empty message to esb_forum-unsubscribe@yahoogroups.com. However, please consider that the Council expects this electronic mailing list to become an important instrument in the life of the Society.

Some useful information concerning the list's policy, which was also distributed through the mailing list by Marco Viceconti, is summarised below:

- The mailing list's official language is English, so please do not post any message in other languages.

- Subscription is limited to ESB members only. After sending an empty message to esb_forum-subscribe@yahoogroups.com, your subscription will be held pending until we have verified that the applicant is a rightful member of the ESB. If this is not the case, you should first apply for ESB membership (see: http://www.utc.fr/esb/esb/membership.htm)
- Messages are posted to the list, by sending them to esb_forum@yahoogroups.com. Currently the list is not moderated, i.e. everything you post to the list is sent to every list member without any further checking. Thus, we rely on your sense of responsibility; in doubt please contact the list owner at this address: esb_forum-owner@yahoogroups.com. Please notice that only list members can post messages, which gives us the advantage to be protected from spamming and other trouble.
- The messages posted on the list will be sent to the e-mail address that was used for subscription. If you want to change address the easiest thing is to first unsubscribe and then subscribe, both with your new address.
- As a list member if you register to the Yahoo Groups server you can take a look at the archives of posted messages, change your account profile, or use the additional services that the Yahoo Groups server provides. Some of these additional services are interesting for the Society (i.e. the electronic polls) so we invite you to register to the Groups server, although the procedure is a little bit cumbersome (see: http://groups.yahoo.com/group/esb_forum).
- Currently e-mail attachments are allowed. However, since the list is not moderated we strongly advise you to use this feature with great care and to limit the number and size of your attachments.
- The list is currently maintained by Marco Viceconti and his co-workers in Bologna.

Announcements

7th Conference of the European Society for Engineering and Medicine (ESEM)

The biennal ESEM Conference will be organised in Halle (Saale), Germany from September 18th until 21st, 2003. More information can be found in the included flyer or on the conference website http://www.medizin.uni-halle.de/esem-esao-2003/.
The Conference is endorsed by the ESB and will include contributions from the ESB focus groups: ESB satellite symposia on the topics of the focus groups will be organised (see 'preliminary scientific programme' and 'meeting of the ESB focus groups' in the Conference flyer):

- Ultrasound and bone biomechanics (Marie-Christine Ho Ba Tho)
- Tissue Engineering and Mechanobiology (Patrick Prendergast, Keita Ito)
- Dental Biomechanics (Michel Dalstra)
- Biofluid Mechanics (Dieter Liepsch, Pascal Verdonck)
- Implant fixation (Georges Van der Perre, Hannu Aro)

All ESB members are invited to submit an abstract on these topics or on the following topics: musculoskeletal biomechanics, sports biomechanics, occupational and safety biomechanics. Abstract submission deadline is April 18th, 2003.

IASTED International Conference on Biomechanics – BioMech 2003

BioMech 2003 will be held from June 30 to July 2, 2003, in Rhodes, Greece, and is supported by the ESB. For more information, see Conference website: http://www.iasted.org/conferences/2003/greece/biomech.htm. Abstract submission deadline is April 1st, 2003.

EC Liaison committee: call for participation

As announced in the previous Newsletter by Marco Viceconti, the ESB has started an EC Liaison Committee. In response to the 6th Framework Program of the European Commission, the Committee will promote biomechanical research at the European level, by increasing its visibility and by establishing international research networks (which in the long term should result in a 'European Research Area' for Biomechanics). In the last Council meeting the following members were appointed in the EC Liaison Committee: Marco Viceconti, Marie-Christine Ho Ba Tho, Jos Vander Sloten, Romuald Będziński and Nikos Stergiopulos. Members interested in helping with this Committee should contact Marco Viceconti (viceconti@tecno.ior.it).