NEDERLANDSE VERENIGING VOOR MATRIX BIOLOGIE

NVMB

Dutch Society For Matrix Biology

Newsletter of the Dutch Society for Matrix Biology
Nr 21 December 2012

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Preface

THE END OF 2012

The year 2012 is an interesting year. Some believe some cataclysm will happen on or after the 21st of December 2012 as the Mayan calendar is supposed to stop at that date. Others say that is a misinterpretation and the calendar will only enter a new phase of the so-called long count of it (both views do not address the question on which grounds the Mayans can be believed to have had prophetic views, by the way), and are happy that the planet earth may last another 5 billion years before the sun runs out of fuel. Anyhow, it is December 6th when I am writing this foreword to the Dutch Matrix Biology Society (NVMB) Newsletter, so I am more than comfortable with at worst 15 days to enjoy left and at best 5 billion years ahead.

The year 2012 has been an interesting year anyhow. Economically the situation has become grimmer and the Society is very happy that we are not rich enough to have an office of our own that we might need to sell. Getting research money is not becoming easier and pressure on the still existing funds can be predicted to become more intense in the foreseeable future. However, there are good developments as well. There is much, and increasing, interest in regenerative medicine and our work in matrix biology research is very closely related to regenerative medicine, either as providing the basis to it in a more fundamental sense, or in putting it in practice in a more applied way.

The Society is also doing well. We have 117 members now, which is well over the average membership we have had over the past 10 years. We had a successful meeting in Lunteren in May and the one-day symposium on epigenetics of last month was a scientific success too from which we received very good feedback. The attendance was disappointing in numbers, which probably had to do with both the unfamiliarity of many matrix researchers with the topic (which is, however, very relevant to matrix biology as well) and the late announcement, for which the Board apologises. We still think the format of a one-day symposium is good and shall continue with this initiative.

The Society is also participating in the organization of the 1st Matrix Biology Europe meeting that will be held in Rotterdam July 5-8th, 2014. This is a new name for what would have been the 24th meeting of the FECTS (Federation of European Connective Tissue Societies). The term

"connective tissue" is deemed outdated and "matrix biology" represents better what we are working on. There are, in the field of national and international Matrix Biology societies, important developments on the horizon about which we'll inform the membership in a later stage when things have taken more shape. These developments also demonstrate the growing importance of our area in the entire research field of (medical) biology.
We can conclude that, notwithstanding some adverse economical issues, we are lucky to be working in a rapidly expanding field that continues to provide scores of intellectual and practical challenges for our research. So, unless the apocalyptic exegesis of the ancient Maya calendar comes true (in that case, enjoy the next days!), our future looks bright and more than interesting. The Dutch Society for Matrix Biology hopes to contribute to the further development of our field and wishes you a healthy, successful and happy 2013!

René van Weeren, Chairman

NVMB epigenetics symposium (Het Paard, Utrecht, November 22, 2012)

The theme of this year's symposium was epigenetics. Though with a smaller audience than last year, the program was no less interesting, which was supported by the polls. Prof. Marianne Rots (UMCG) explained crystal clear how the epigenome is edited by cooperating systems that read and write marks on DNA and chromatin. Furthermore, it was exciting to learn that the epigenome and thus its regulated gene expression can be influenced. Further speakers such as prof. David Young (Newcastle), dr. Hendrik Marks (RUMC) and dr. Willem Voncken (MUMC) eluded to the entire range of epigenetics in a from bed to bench and back approach i.e. from the establishment of comprehensive databases for epigenome analyses via epigenome – matrix relationships to the influence of the environment on epigenomes. Dr. Frank Dekker (UMCG) discussed the development of tailor-made novel drugs that target specific epigenetic pathways. Two PhD students (Monika Maleszewska and Rutger Gjaltema, UMCG) complemented the successful symposium with presentations that showed that epigenetics is by no means simply studied, yet very fascinating. At the end of the day, the audience felt triggered to further explore the opportunities to include epigenetics in their research on extracellular matrix.

Marco Harmsen

Note the provisional date of our symposium on 'Microparticles' in 2013: November 14.

Board mutations

Leonie Los left the board during our meeting in May in Lunteren. At the same meeting, the board installed Debby Gawlitta as a new member of the board.

Annual meeting

We would like to invite your for our annual meeting on *May 23 and 24 2013* in *de Werelt in Lunteren*.

Presentations
For the (oral) presentations we would like to ask you to submit an abstract. Every abstract that is submitted, will be scheduled for an oral presentation. The abstract format can be found on our website. The abstract deadline will be announced shortly.
At the end of the second day of the meeting, the Pauline van Wachem award for the best oral presentation and Arnold van den Hooff award for the best contributor to the discussions will be presented among the AIOs/OIOs/AGNIOs/ technicians. Moreover, the Bertus Kemp award will be awarded to one of the researchers that have defended their thesis in the year 2011 (more information below).

The evening lecture will be given by Bruce Caterson, professor at the Cardiff School of Biosciences. Over the past 27 years Professor Bruce Caterson's research has focussed on the production, development and use of monoclonal antibody technologies for studies of connective tissue proteoglycan metabolism in health and disease. These studies have focussed on matrix proteoglycan metabolism in musculoskeletal tissues with a particular emphasis on studies involving molecular mechanism underlying the pathogenesis of degenerative joint diseases; i.e. osteoarthritis and rheumatoid arthritis.

Bertus Kemp award

Every year the SBBN, 'De Stichting ter Bevordering van Bindweefselonderzoek Nederland', awards the Bertus Kemp prize for the best thesis in the field of connective tissue research. On behalf of the board of the SBBN we invite you and your colleagues to submit the thesis, if defended in 2012, for the Bertus Kemp award 2013.

To be eligible for the 2013 award, you need to send your thesis together with a list of most recent accepted papers to every member of the committee (one set per member). The deadline for submitting your thesis is April 2 2013 and at least five theses should be submitted in order for the committee to reward the prize.

The Bertus Kemp prize will be awarded during the annual meeting on May 24, 2013. The winner is kindly asked to present his or her work during the meeting.

The committee consists of the following members:

Prof. W. van den Berg
Reumatologie, NCMLS
Geert Grooteplein 28
6525 GA Nijmegen

Dr. J. Cleutjens
Pathologie, UMCM
Postbus 616
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Prof. G. van Osch
Orthopaedie & KNO, Erasmus MC
Dr Molewaterplein 50, Room Ee1614
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PhD defences

November 5, TU/e.
Ana Soares (hondroc F. Baaijens, co-promotor C. Oomens)
"Modeling collagen hondrocyte in tissue engineered cardiovascular tissues"

Collagen is a crucial component of cardiovascular tissues, since it allows the tissue to withstand its highly demanding mechanical environment. In tissue engineer, conditioning protocols are used to stimulate the collagen synthesis. As the mechanical properties of the tissue constructs are not yet optimal, these conditioning protocols have to be optimized. However, the interaction between collagen hondrocyte and mechanical loading is complex due to their coupled nature. Structural mathematical models are thought to assist in studying this complex interplay. Recently, a model relating the changes in the collagen fiber architecture to the local mechanical conditions within the tissue was developed (Driessen et al., 2008). Although the model succeeded in predicting the typical helical fiber architecture found in the native arterial wall, it failed to describe the collagen fiber architecture of TE small diameter vessels developed under

static conditions. This is because under static culture conditions there is no external load to drive the collagen hondrocyte algorithm. Therefore, the objective of this work was to investigate collagen hondrocyte in native and TE conditions. First, a structure based model (Driessen et al., 2008) was applied to assess and evaluate the mechanical properties of pairs of aortic and pulmonary valves. The results from biaxial tensile tests were used to determine the model parameters. Our study showed that the pulmonary valve leaflets appeared to remodel by increasing their thickness and rotating their fibers towards the circumferential direction. Secondly, growth was incorporated in the model employing the volumetric growth theory and the model was used to investigate collagen hondrocyte of TE vessels under static loading conditions. Using this extended model, the distribution of the collagen architecture of tissue engineered vessels developed under static loading conditions could be successfully described. Afterwards, two models were integrated: the first one describing the mechanical hondrocy of collagen fibers and the second one the synthesis and degradation of α-actin stress-fibers in the cell and the active, contractile forces that also develop in the cells. The framework was then applied to study the collagen hondrocyte of tissue engineered constructs developed under static loading conditions. The model successfully described the experimental results of tissue engineered strips developed under static loading conditions. The model also successfully predicted the non-intuitive collagen orientation in tissue engineered small diameter vessels.

December 4, 16.15, Academiegebouw Utrecht.
Joris Bekkers.
"Towards one-stage stem cell based treatment and non-invasive evaluation of cartilage defects"
Link to thesis: http://www.e-pubs.nl/?epub=jorisbekkers

Focal articular cartilage lesions impose a serious socioeconomic burden and challenge the injured. The inability to participate in sports or even being hampered in activities of daily living, due to knee pain, swelling and locking, are huge restrictions that do not fit the overall active lifestyle of the decennia in life (patients range from 20-40 years) at which a focal lesion usually clinically presents. Several treatments can be applied to manage the defect and restore the articular surface to improve knee function and reduce pain. Among those, microfracture, autologous hondrocytes implantation (ACI) and osteochondral autologous transfer (OAT) are most frequently applied. As each treatment is based on a different principle it is reasonable to assume that their performance differs per type of patient cohort. Therefore, increasing knowledge on what factors determine clinical success per treatment type is essential to take full advantage of the potential of a specific technique. In addition, the fact that a treatment is clinically successful does not mean that further evolution is impossible. ACI, for example, has some generally acknowledged shortcomings, which, if solved, could possibly even further improve the clinical results. This also goes for the evaluation of cartilage treatment. The introduction and use of validated outcome tools that provide an idea of the clinical success as well as the quality of structural regeneration would be ideal.
Therefore the aim of this thesis was to improve the clinical outcome of patients with a focal articular cartilage lesion treated with autologous hondrocytes implantation, by improvement of the surgical technique, the development of specific treatment algorithms and the evaluation and validation of suited outcome tools.

Summer school on Regenerative Medicine

08 July 2013 – 19 July 2013: summer school on Regenerative Medicine in Utrecht. For advanced bachelors/beginning masters in the (bio)medical and life sciences. For information and registration see website.

Conferences

2013		
Annual meeting of the ORS	San Antonio, Texas	January 26-29
World Congress on Osteoarthritis / OARSI	Philadelphia, Pennsylvania	April 18-21
TERMIS-EU	Istanbul, Turkey	June 17-20
ICRS	Izmir, Turkey	September 15-18
NVMB symposium 'Microparticles'	TBD	November 14 (TBD)
NBTE	Lunteren, Netherlands	November 28-29
2014		
Matrix Biology Europe (FECTS)	Rotterdam, The Netherlands	July 5-8
2015		
4th TERMIS World Congress	Boston, MA, USA	TBD