

NEWSLETTER

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Message from the President

A most memorable Münster meeting

For EUCHIS' internal history 2015 will be remembered as the Münster year because this friendly and beautiful Westphalian city hosted last summer our bi-yearly EUCHIS meeting and the triennial ICC. Münster introduced moreover a new appointment in our agenda, namely a Young Researcher Symposium that should be mandatory from now.

Young people was actually a pervasive and auspicious phenomenon of the meeting: a large number of student attendees, an incredibly kind and efficient troupe of Professor Mörschbacher's young collaborators and many young researchers attending the first symposium devoted to "junior" chitin and chitosan marked the whole event.

Even if it was given for granted an impeccable organization of the event the result was above expectations: congratulations to Professors B. Moerschbacher, F. Goycoolea and all their collaborators!

Last year the Society has also been making a thorough updating of its instruments: a new webpage, a new data base, an actualization of membership and budget, a modernized Newsletter can enhance EUCHIS chances for internal communication and for an external dialogue with academia and business.

The Münster meeting had also time to remember our immediate past upon which present and future are built: we have paid a deeply felt homage to former presidents of our Society, some of them present at the meeting and fortunately still active and collaborative.



Prof. Angeles Heras (right), President since 2013, presenting a small token "To Professor XX in due recognition of her/his Presidency of the European Chitin Society". From left: Prof. Kjell Vårum, President 2004 – 2009, Prof. Sevda Senel, President 2009 – 2013, Prof. Martin Peter, President 1999 – 2004.

To sum up, we have seen in Münster a new generation of researchers taking the torch from the hands of the former one to go on working in a new generation of chitosans for the enlargement of knowledge and the benefit of worldwide consumers.

The next 13th EUCHIS' meeting will be held in June 2017 in Spain in a "joint venture" between Madrid and Seville in conjunction with the 8th SIAQ. In this way the Ibero-American and the European Chitin Societies will share calendar and venues for the first time; a tribute to the linking property of these biopolymers!

Angeles Heras
President of EUCHIS

Editorial

Probably all of our readers were looking eagerly for another EUCHIS Newsletter. Indeed, just two editions appeared in the last two years, No. 34 (July 2013) edited by Malgosia Jaworska, Secretary until September 2013, and No 35 (August 2015), issued by Angeles Heras, President of EUCHIS. A new Board was elected in September 2015. We will do our best to issue Newsletters at least twice per year, according to the Statutes of EUCHIS.

Most sadly, we heard about the passing away of Professor Saburo Minami. An obituary is presented by Professor Hideo Kusaoke, President of Japanese Society for Chitin and Chitosan (p. 4). We will remember Professor Minami as an always cheerful, enthusiastic colleague and a very active, outstanding scientist in the field of biomedical applications of chitosan.

This Newsletter appears after the very remarkable joint ICCCE/EUCHIS Conference in Münster, Germany, September 2015, perfectly organized by Bruno Mörschbacher and his team (p. 8).

The culinary highlight was the conference banquet. Participants were invited to enjoy a most delicious menu and wine in the highly renowned, High Society "Zwei Löwen Club". Prof. Angeles Heras took the opportunity to recognize the services of the former EUCHIS Presidents for their work and great contribution to the Society.

The conference and all events were attended by a large number of young students and scientists from all over the world. Six of them were supported in part by EUCHIS travel awards (p. 10).

The *Braconnot* Prize was awarded to a young scientist from India, acknowledging his contribution to chitin/chitosan science with his PhD thesis, "Structural and mutational analysis of transglycosylation by chitinase-D from *Serratia proteamaculans*" (p. 13). His work was also presented in a plenary talk as the "Braconnot Lecture". Congratulations to Dr. Jogi Madhuprakash!

The three best out of the some 200 posters presented in Münster won EUCHIS poster awards (p. 14). Another award was the *AAPS PharmSciTech* Poster Prize, donated by the American Association of Pharmaceutical Scientists (p. 16). Congratulations to Professor Sevda Senel and her team!

This Newsletter contains also the Minutes of the General Assembly (p. 17) and of the Board Meeting (p. 19) during which the Committee of the Board for the period September 2015 – August 2017 was elected.

The EUCHIS Newsletter is a very essential instrument of communication within our Society. We invite all of our members to contribute. Make yourself known in the Chitin World! Here is the forum for publishing abstracts of thesis, your opinion about particular aspects of chitin and chitosan, highlight the most important articles which recently caught your attention, debate about critical issues in chitin/chitosan science, and report what is going on in your laboratories.

Send us your criticism about the Newsletter and the Society, and also your compliments. We all need feedback for what we are doing. Write it here!!! Send your contributions, including JPG or other graphics and texts as WORD or RTF or PDF files to the Secretary (s.bratskaya@gmail.com) and/or to the Assistant Secretary (Martin.Peter@uni-potsdam.de).

We wish you all a peaceful, prosperous New Year, good health and personal as well as professional success and rewards!

Svetlana Bratskaya, Secretary
Martin G. Peter, Assistant Secretary

In Memory and Honor of Professor Saburo Minami



On May 22nd this year, I received the sad news that Professor Saburo Minami passed away. I was greatly shocked, because I had lunch together with him and his wife in Tottori in November last year. At that time he looked healthy and was talkative, energetic and cheerful as usual. Of course I had known that he had been under medical treatment for a few years, but I didn't think that he was so seriously ill. I heard that the condition of his disease took a sudden turn for the worse. He died of liver cancer at the age of 67. The lunch with him in Tottori happened to be the last dinner for us.

As you know, in October in 2013, the 10th APCCS was held in Yonago City in Tottori Prefecture in Japan. Professor Minami was responsible for the conference as a chair and took an active part in it. Five months before the conference, in May in 2013, 12th EUCHIS was held in Porto in Portugal. At that time he did his best to make much propaganda of the 10th APCCS which would be held in Japan. His image at that time still comes up in my memory now and then as if it were very recent. Also, he was the president of Japanese Society for Chitin and Chitosan from 2011 to 2013.

We respect Professor Minami as one of the eminent and excellent researchers in the world. He did many biomedical studies such as wound healing effects of chitin and its derivatives and on enhanced healing of cartilage injuries by oral administration of glucosamine. He made presentations at the international conferences. I think that his presentation in fluent English attracted the audience and created a strong impression on them. He always spent a great effort to make his presentation easy to understand, preparing very interesting illustrations. His speech was always full of wit and humor not only when he spoke in Japanese but when in English. The data of his experiments were excellent and persuasive. The number of his published reports is more than 200. I believe he is a real man of conviction and I love and respect him as our leader.

I took part in the 13th ICCC and the 12th EUCHIS in Münster this year, my wife was accompanying me. It was her second participation in the international conference, because we took part in the conference in Mexico this April. She was very looking forward to seeing Professor Minami and his wife in Mexico, for we had an opportunity to see them and had a really good time in Fukui in 2012. We were very sorry, however, we were very happy to see many nice people from all over the world, some of whom we were able to see again after a long time. Thanks to the efforts of many people, it was decided in the 13th ICCC and the 12th EUCHIS held in Münster that the 14th ICCC and 12th APCCS 2018 will be held in Osaka in Japan. It was Professor Minami's strong desire to hold the ICCC and APCCS 2018 in Japan. I believe he is now happy to know the news. I hope to see all of you in Osaka in 2018. I really appreciate all of my friends living on the globe.

October 13th, 2015

Dr. Hideo Kusaoke
President of Japanese Society for Chitin and Chitosan
Professor of Fukui University of Technology, Japan

Professor Saburo Minami

BIRTHDAY: 1948.02.16

DEGREE

Doctor of Veterinary medicine, 1984, University of Azabu

Master of Agriculture, 1972, Graduate School of Agriculture, Tottori University

PROFESSIONAL EXPERIENCE:

2013-2015 Emeritus professor, Tottori University

2013-2014 President of Tottori veterinary medical association

1998-2013 Professor, Livestock Surgery, Tottori University

2001-2005 Head of Animal Hospital, Tottori University

1986-1997 Associate Professor, Tottori University

RESEARCHES

1. Study on wound healing effects of chitin and its derivatives
2. Study on enhanced healing of cartilaginous injuries by oral administration of glucosamine
3. Study on enhanced healing of cartilage injuries by oral administration of collagen peptide, fucoidan, and sulfated amino acids

PROFESSIONAL ACTIVITIES

2014 Honorary member of Japanese Society for Chitin and Chitosan

2011- 2013 President of Japanese Society for Chitin and Chitosan

2009- 2012 President of Association for Glucosamine Research in Japan

2013 Chair of 10th Asia-Pacific Chitin and Chitosan Symposium (APCCS), Yonago Japan

1972 Chair of 147th Japanese Society of Veterinary Medical Science conference, Tottori, Japan

1998-2012 Member of directors, Japanese Society of Veterinary Anesthesia and Surgery
Member of directors, Japan Livestock Animal Veterinary Association

Selected Publications (2001 – 2015)

- Azuma, K., M. Nishihara, H. Shimizu, Y. Itoh, O. Takashima, T. Osaki, N. Itoh, T. Imagawa, Y. Murahata, T. Tsuka, H. Izawa, S. Ifuku, S. **Minami**, H. Saimoto, Y. Okamoto and M. Morimoto (2015). "Biological adhesive based on carboxymethyl **chitin** derivatives and **chitin** nanofibers." *Biomaterials*, **42**, 20-29; <http://dx.doi.org/10.1016/j.biomaterials.2014.11.043>.
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- Azuma, K., T. Osaki, T. Inagawa, T. Tsuka, Y. Okamoto, S. Ifuku, H. Saimoto and S. **Minami** (2013). "Effects of **chitin** nanofibrils on experimental mouse model for ulcerative colitis (UC)." *Kichin, Kitosan Kenkyu*, **19**, 5-11.

- Ohnishi, A., T. Osaki, Y. Matahira, T. Tsuka, T. Imagawa, Y. Okamoto and S. **Minami** (2013). "Correlation of plasma amino acid concentrations and chondroprotective effects of **glucosamine** and fish collagen peptide on the development of osteoarthritis." *J. Vet. Med. Sci.*, **75**, 497-502; <http://dx.doi.org/10.1292/jvms.12-0241>.
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Conference Report

12th EUCHIS / 13th ICCC

Münster, Germany

From Sunday, August 30th, to Wednesday, September 2nd, the “Who’s who” of chitin and chitosan research and business met in Münster, Germany, for the 12th International Conference of the European Chitin Society EUCHIS, which was combined with the 13th International Chitin and Chitosan Conference ICCC. ICCC is held every three years, in turn organized in conjunction with the meetings of EUCHIS, the meeting of the Ibero-American Chitin Society SIAQ, or the Asia-Pacific Chitin and Chitosan Symposium APCCS. After Taipeh, Taiwan, in 2009 and Fortaleza, Brazil, in 2012, it was EUCHIS’s pleasure this year. At a turning point in the research and business of chitosan, when well-defined “second generation” chitosans with reliable performance are becoming available on an industrial scale to allow the development of novel chitosan-based products, EUCHIS/ICCC 2015 convened perhaps the largest community of chitosan researchers ever, to discuss recent developments and future options.

The local organizing team around Bruno Moerschbacher and Francisco Goycoolea from the University of Münster, reinforced by ex-EUCHIS president Martin Peter from University of Potsdam, the current EUCHIS president Angeles Heras from University of Madrid, and Katja Richter from Heppe Medical Chitosan in Halle, was supported by a large and strong International Scientific Advisory Board. Together, they decided to put an emphasis on making this conference an ideal platform to foster networking, between young researchers and experienced experts, as well as between scientists from Academia and Industry. For the first time, EUCHIS/ICCC started with a half-day Young Researchers’ Symposium, organized by André Nordhues and Shoa Naqvi from Münster, Tonimar Senra and Jorge Delezuk from São Paulo, Brazil, and Kazuo Azuma from Tottori, Japan, and reserved for PhD students and young post-doctoral researchers only. This setup allowed for lively and fruitful discussions and we think it might be continued in future meetings.

Three brilliant Plenary lectures highlighted hot topics in the field: Hermann Ehrlich (Germany) on "Chitin of Poriferan Origin, from Discovery to Application in Biomedicine and Technology", Caroline L. Schauer (USA) on "Electrospinning of Chitosan Nanofibers", and Jogi Madhuprakash (India), winner of the Braconnot Prize, on "Structural and Mutational Analysis of Transglycosylation by Chitinase-D from *Serratia proteamaculans*".

During the conference, ample opportunities for meetings and exchange were also given, starting with a conference picture wall where (almost) all participants posted their photo and name, for others to more easily identify them. A Match Making hour was organized powered by a conference app in which each participant could choose other participant for a “speed date” type of meeting. The app was sponsored by the European Research Project Nano3Bio on biotechnological chitosan production and will be available to future meetings, too. If we continue this type of interaction, it might become even more successful than in Münster when it was new to everyone. Extended poster sessions gave plenty of time for discussions, too, and happy hours with free cocktails kept people inside the tents where the posters and the industrial exhibition took place. And of course, the gala dinner which was heavily sponsored for student attendees and even more so the following party lasting into the wee hours of the morning offered more opportunities for social and scientific interactions.

The Speed Talks Session gave ten poster presenters - selected by votes from all participants - to present their work to the plenary auditorium which then, again using the conference app, voted for the three poster prizes. The idea was to emphasize the interactive poster sessions as the core of the conference where everyone is actively involved. The quality of the posters was clearly as high as that of the talks given, and naturally more diverse, underlining again that presenting a poster was as valid and valued a contribution to the success of EUCHIS/ICCC 2015 as giving a talk.

Another highlight of the conferences was the central plenary session on “The Future of ChitosanS: New Sources, New Applications, New Markets”. Here, experts mostly from both Academia and Industry gave an insight into what we can expect to happen on our way from second to third generation chitosans, and from scientific research to applied development. Topics were Alternative Sources for Chitin and Chitosans, Lessons to be Learned from Other Polysaccharides, Chitosan-Based Product Development and Registration, and Upcoming Markets for Chitin and Chitosans. Together with the display of different chitosans and chitosan-based products from around the world, and the fledgling industry exhibition which we hope will grow over the conferences to come, this gave an impressive insight into what a versatile family of compounds chitosans are.

The conference was followed by three parallel post-conference events: a half-day Workshop on Chitosan Analysis organized by Nour Eddine El Gueddari, Münster, a one-day Symposium on Mucoadhesive Chitosans organized by Carla Caramella, Pavia, Italy, and Francisco Goycoolea, and a two-days COST Workshop on Chitosan Electrospinning organized by Gustavo Rivera, Münster, and sponsored by the COST Action MP1206 on Electrospinning. All three satellite events were well visited and gave deep insights into new developments in the chitosan field which will open new opportunities in future: analytical tools have paved the way for the revolution of second generation chitosans and will continue to play a central role on our way towards next generation chitosans; mucoadhesion is one of the more recently appreciated bio-relevant properties of chitosans that reveal a huge new potential for biomedical applications; and chitosan is one of the prime candidates for electrospinning, a method with a clear potential for scalable nanoformulation of biopolymers. Watch out, there is more to expect from novel chitosans!

We, the organizers of EUCHIS/ICCC 2015, are still happily looking back to a very stressful, but also tremendously rewarding time. We are extremely grateful to all participants who have contributed to the wonderful atmosphere we had, and of course also for the high quality of the scientific contributions – poster and oral presentations, discussions and exhibitions. We were particularly pleased to see that the plenary Future of ChitosanS sessions were well attended, and that the poster sessions combined with the industrial exhibition really turned into the core of the conference. Our sincere thanks go to the companies who have contributed to this success with sending or bringing their exhibits, and a very special thank you of course goes to the sponsors who supported the conference also financially. If you care for a taste of our conference, check out the picture gallery at <http://chitin2015.eu/photos>. Even better: join one of the next chitin/chitosan conferences, 2016’s APCCS in India, 2017’s EUCHIS in Spain, or 2018’s APCCS/ICCC in Japan - or best: all of them!

Bruno and Francisco and the whole organizing team

EUCHIS Travel Awards

Shakeela Sayed

Department of Chemistry
University of Cape Town, South Africa



My interest in the sciences stemmed from an early age which greatly influenced my field of study. It was my desire to study chemistry which led me to the decision to study further, the University of Cape Town seemed the natural choice as it is the top university in Africa and conveniently located near my home. I spent the early part of my studies obtaining an Undergraduate and Honours Degree in Chemistry and later went on to graduate with my MSc. (with distinction). Unable to leave the sciences just yet, I registered for my PhD. While I have been exposed to many interesting research areas, I have developed a special interest in polymer science. I am partial to the application of the biopolymer chitosan, owing to its many interesting properties. In my master's project, I applied chitosan and derivatives thereof in the removal of certain contaminants from water. In addition, I tested the antimicrobial properties of selected chitosan derivatives synthesized. The focus of my doctoral project is to investigate 'greener', more efficient methods of synthesis of the diamino derivative of chitosan. In addition, the polymers synthesized will be applied to various real life applications such as hair care and other selected biomedical applications.

EUCHIS Conference Travel Grant report

Having received a travel grant from the European Chitin Society, I was awarded the pleasure of attending the 12th International Conference of the European Chitin Society/13th International Conference on Chitin & Chitosan in Münster, Germany.

This was my first trip to Europe and I felt that my high expectations were met, with a truly international event with participants from over 30 countries from both industry and academia. The researchers attending ranged from various disciplines from biochemistry to engineering, thus giving a broad overview of the different topics related to these polymers. The conference also provided me with insight into the current research topics in the field of biopolymers limited not only to chitin and chitosan. Topics which were highly relevant to my project were presented, providing me with a new perspective on the literature that I had previously researched.

The 3 plenary lectures presented by leading experts giving an overview of diverse chitin and chitosan related topics were very informative. What I found impressive, was that 30 mini symposia ran in parallel effortlessly, with up and coming researchers presenting their work. My only regret is that I could not attend all the talks so I was forced to choose those most relevant to my research. I found that the match making event and presentations from various companies all involved in the distribution and application of these biopolymers very constructive. This allowed the participants to actively engage. The two poster sessions with more than 170 posters presented by students and academics were very thought-provoking. During these sessions, I was able to present my work in a poster format to an audience of my seniors and peers who contributed to a better understanding of my research topic. This opportunity presented me with practical experience in terms of clearly communicating my work thereby providing me with the skills necessary to grow professionally. It also provided a perfect opportunity to network amongst scientists on a global platform.

I also attended the technical workshop offered by the conference, which targeted researchers interested in understanding basic and advanced techniques of chitin and chitosan analysis. This workshop addressed some of my concerns which arose while working with these biopolymers. This enabled me to interact, assist and learn from individuals who had faced similar issues with their research. By attending this conference, I have gained a clearer understanding on what the focus of my project should be and how to achieve my previously set goals in order to complete my PhD.

This was by far the most well organized conference that I have attended where special emphasis was placed on the development of students and young researchers. In addition, great effort was made to involve industry to facilitate the transfer of ideas from the benchtop to the market. It was encouraging and motivating to hear from fellow researchers and students working with chitin and chitosan.

I would like to take this opportunity to thank EUCHIS for the financial support which made this trip a success.

Jesus Rojas Osnaya

Universidad Autonoma de Mexico
Itztapalapa, Mexico City



I am 27 years old, and a student studying for my doctorate in Biotechnology at the UAM University Campus Itztapalapa. My master's thesis was that which I presented at the congress, namely the production and purification of chitinases from *Lecanicillium lecanii*, in order to prove whether or not they are capable of transglycosylation activity.

Attending the congress in Germany was one of the most emotional experiences of my life because it allowed me to gain and experience and confidence in myself in preparation for the next stage of my professional career. This was my first time attending an international congress with great significance in the sphere of biotechnology. Furthermore, the congress happened in Germany, a country that I had the opportunity to visit previously, although I had not visited Munster. My participation in this congress consisted of presenting a poster that I had presented, although never in English. This helped me to socialize and practice the English language which is fundamental and indispensable to acquire and transmit knowledge.

I especially enjoyed the punctuality, formality, and attention to detail which we encountered during the congress. I wish to thank the event's organizing committee for bestowing the EUCHIS scholarship, and which has helped to inspire me to continue with my studies. I hope that many other students have the opportunity to experience this stimulation and to be motivated to continue to achieve their goals. My time in this city was very pleasant, and I got to know friendly people, try the delicious cuisine of this city, and to appreciate anew the German architecture, which is so distinct from my country. I was very interested in the ecological consciousness of the German people, such as utilizing bicycles for public transport thus reducing atmospheric contamination. I would like for the Mexican people to have this same consciousness in order to improve our quality of life and to care for our environment.

During the congress I came to know individuals from many different countries who are developing their skills in fields related to mine, and I owe them a debt of gratitude for sharing with me their advice and experience which will be of great help to me in the future. Professionally, my attendance at this congress was very important because I was able to establish

relationships with people from much of the world. This will help me to explore and discover new techniques as I develop.

Traveling to another country left me with the desire to dedicate myself to the investigative branch, and in this way to come to know and develop from the science of other parts of the world and enrich my knowledge. Personally, this congress left me with the desire to better myself and to learn more so that, in the not too distant future, I may pass on wisdom to students who like me desire to contribute to the scientific society of their country.

Elisa Sánchez Quesada

Universidad Complutense
Madrid, Spain



I am 26 years old, and I work in the research group of Dr. Angeles Heras Caballero as a researcher. I have been graduated in Biology and Biochemistry and I made a Master in Biotechnology. After seven years of scientific learning I realize the social responsibility that is required for the professional work of all those who want to pursue science. In the summer of 2010, I had the opportunity to do my first internship. During my stay, I realized that my calling was to help people through science. Also I developed the ability to work in teams and cross-teams. In my opinion, this interdisciplinary helps professional effectiveness. The advancement of science shows that progress is based precisely on joint work between different knowledge so teamwork is essential to open new horizons in scientific progress and EUCHIS conference made this possible. Sometimes things are not so obvious, and the achievement of scientific certainty is not always easy. This difficulty promotes personal and professional conduct in the workplace, and that adversity requires rigor and the growing desire for truth.

Two years ago I had the opportunity of made my master thesis in the research group of Dr. Angeles Heras Caballero and was the first time that I started to work with chitosan. It was a new element in my life with a lot of interest to me. At the end of the master thesis, Angeles Heras gave me the opportunity to join with her research group. These years until now, give me a lot of personal satisfaction and a lot of new knowledge in science and more in deep in chitosan. My last satisfaction was our last publication in Marine drug about encapsulation of chitosan microspheres loaded with olive leaf extract (Acosta, N.; Sánchez, E.; Calderón, L.; Cordoba-Diaz, M.; Cordoba-Diaz, D.; Dom, S.; Heras, Á. Physical Stability Studies of Semi-Solid Formulations from Natural Compounds Loaded with Chitosan Microspheres. *Mar. Drugs* **2015**, *13*, 5901- 5919).

I have received a travel grant from the European Chitin Society and I was awarded the pleasure of attending the 12th International Conference of the European Chitin Society/13th International Conference on Chitin & Chitosan in Münster, Germany. This conference was the first one in my live and all my expectations were overtaken and also give me the opportunity to present with a poster my recent results of my research project. One of the main points of the EUCHIS Conference was the organization of all the volunteers, that resolve any doubt of any participant with a lot of attention and education. The conference inspired an emotional and family environment and made all participants feed as home. Another goal of the conference that I need to remark is the variety of research areas and topics and the new applications of different polymers specially chitosan that were news for me. Also the amounts of companies that work in chitosan development were important in the conference that makes it possible. In this conference I realize the big world of chitosan and chitosan derivatives; I had the opportunity to meet people for different countries with the same professional concerns. With this conference I learn a lot, I

improve some skills and I meet wonderful people that they have enriched me as personally and professionally. I would like to take this opportunity to thank EUCHIS for the financial support which made these possible and let young researches the possibility to pursue science.

The European Chitin Society

PRIX BRACONNOT 2015

Structural and mutational analysis of transglycosylation by chitinase-D from *Serratia proteamaculans*

PhD Thesis

By **Jogi Madhuprakash**

University of Hyderabad.

Supervisor: Prof. Appa Rao Podile



Abstract

Serratia proteamaculans chitinase-D (*SpChiD*) has a unique combination of hydrolytic and transglycosylation (TG) activities. TG activity of *SpChiD* can be used for large-scale production of chito-oligosaccharides (CHOS). To gain insights into the unprecedented catalytic properties of *SpChiD* the crystal structure was determined at 1.49 Å resolution, which showed the presence of loop, Asn30-Asp42, at the substrate-binding cleft apart from few unusual dual conformations for the residues Ser110, Asp151 and Met220. The multiple activities (hydrolytic and/or chitobiase activities and TG) of *SpChiD* appear to be strongly influenced by the substrate-binding cleft. Here, we report that the residues Tyr28, Val35 and Thr36 control the chitobiase activity whereas, the residues Trp160 and Trp290 are crucial for TG activity of *SpChiD*. Mutants with reduced (V35G and T36G/F) or no (*SpChiD*Δ30-42 and Y28A) chitobiase activity produced higher amounts of the quantifiable even-chain TG product with degree of polymerization (DP)-6, indicating that the chitobiase and TG activities are inversely related. Unlike other chitinases, the single modular *SpChiD* showed dual unfolding transitions. Ligand-induced thermal stability studies with the catalytically inactive mutant of *SpChiD* (E153A) showed that the transition temperature increased upon binding of CHOS with DP2–6. Isothermal titration calorimetry experiments revealed the exceptionally high binding affinities of E153A to CHOS with DP2–6. These observations strongly support that the architecture of *SpChiD* substrate-binding cleft adopted to control chitobiase and TG activities, in addition to hydrolysis. The divergent *SpChiD* substrate-binding cleft generated elicitor-active CHOS by hydrolyzing chitosan with a degree of acetylation (DA) of 61%.

Acknowledgements

This work was carried out under Deutsche Forschungsgemeinschaft (DFG) (Germany) and UGC (India) – supported International Research and Training Group on “Molecular and Cellular Glycosciences” between University of Munster and University of Hyderabad. Part of the work done was supported by the European Union’s Seventh Framework Programme for research, technological development and demonstration under Nano3Bio consortium agreement n°613931.

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EUCHIS Poster Prizes

1st Prize (300 €)

Structural analysis of chitin oligosaccharide deacetylases – the “subsite capping model”

X. Biarnes Fontal¹, H. Aragunde¹, D. A. Albesa-Jové², M. Guerin², A. Planas¹

¹Universitat Ramon Llull, Spain; ²Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain



Chitin deacetylases (CDAs) catalyze the hydrolysis of the acetamido group in GlcNAc residues of chitin, chitosan, and chitooligosaccharides (COSs). A major challenge is to understand how CDAs specifically define the distribution of GlcNAc and GlcNH₂ moieties in the oligomeric chain. The particular acetylation patterns of natural COSs dictate their role in cell signaling and other biological activities.

We present here the structural bioinformatics analysis of this family of enzymes that lead us to the proposal of a model to rationalize the de-*N*-acetylation specificity exhibited by different CDAs: the “subsite capping model” [1]. According to this model, the acetylation pattern exhibited by different CDAs is governed by critical loops that shape and differentially block accessible subsites in the binding cleft of these enzymes.

Acknowledgement. The research leading to these results has received funding from the EU 7th Framework Programme ([FP7/2007-2013]) under grant agreement n°613931.

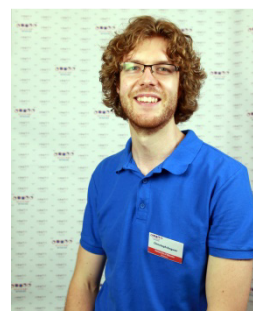
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2nd Prize (200 €)

Mesoscopic gelation of chitosan and genipin at below critical concentrations

C. Engwer¹, R. Loy¹, I. S. Chronakis², A. C. Mendes², F. M. Goycoolea¹

¹University of Münster, Germany; ²Technical University of Denmark, Denmark



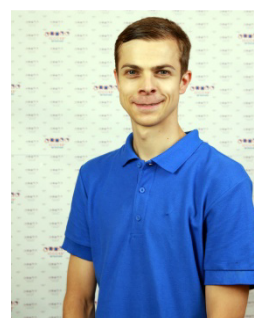
Hydrogels crafted from chitosan are promising for their application as scaffolds for tissue engineering, bacteria immobilization and drug release. The natural crosslinking agent genipin offers a better performance compared to traditional ones such as glutaraldehyde in terms of biocompatibility and toxicity. Yet, little is known about the gelation kinetics of chitosan and genipin. We used dynamic light scattering and small deformation oscillatory rheometry to measure the critical crosslinking and gelation of chitosan with genipin. To this end, we investigated the behavior of chitosans of varying characteristics (molecular weight of 26 to 543 kDa and degree of acetylation from 1.5 to 32 %). In the general theory of gel formation, gelation occurs above a critical concentration. This concentration is thought to be in the verge of the semi-dilute to entangled regime which corresponds to the change in the slope of a log-log plot of viscosity versus concentration. However, we found that gelation of chitosan and genipin occurs below this critical concentration as determined by microviscosimetry. This new phenomenon of mesoscopic gelation of chitosan and genipin will help to understand better the gelation process in this system. Moreover, this offers new potentials to produce low cost chitosan hydrogels and soft hydrogel-based platforms.

3rd Prize (100 €)

Quantitative mass spectrometric analysis to determine the subsite specificity of chitin and chitosan hydrolyzing enzymes

S. Cord-Landwehr¹, P. Ihmor^{1,2}, H. Luftmann¹, B. M. Moerschbacher¹, M. Mormann¹

¹University of Münster, Germany; ²ETH Zürich, Switzerland



Chitosans, a family of fully or partially deacetylated chitin derivatives, are the only known natural occurring polycationic polymers, with potential applications in medicine, agriculture, and cosmetics. The different biological activities of chitosan polymers and oligomers strongly depend on their degree of polymerization (DP), their degree of acetylation (DA), and most likely also on their pattern of acetylation (PA). Chitin and chitosan hydrolyzing enzymes such as chitinases and chitosanases can be used to produce better defined chitosan oligomers as compared to the relatively broad mixtures of oligomers obtained upon partial chemical hydrolysis. The DP, DA and especially the PA of enzymatically produced chitosan oligomers depend on the characteristics of the polymer used as a substrate, most notably on its DA, and on the specificity of the chitinase or chitosanase used. Today's methods for the determination of the subsite specificities of these hydrolases require rather large amounts of enzyme and substrate to produce enough products for size exclusion chromatography followed by NMR. Here, we show a fast quantitative LC-MSⁿ based method that allows the ng-scale analysis of DP, DA and PA of chitosan oligomers using internal stable isotopic labelled standards. We used ChiB from *Serratia marcescens*, the presently best described chitinase, and well defined chitosan polymers with different DAs as substrates. Quantitative determination of the chitosan oligomers generated at different time points of enzymatic hydrolysis allowed accurate determination of the subsite specificities of ChiB that were similar to those described in literature, and revealed additional features of the enzyme not known previously.

AAPS PharmSciTech Poster Prize

AAPS PharmSciTech is proud to announce that the poster prize for the ICCS / EUCHIS 2015 12th International Conference of the European Chitin Society and 13th International Conference on Chitin and Chitosan was awarded to Ayben Işılray Doğan, Gulcin Akça, and Sevda Şenel from Hacettepe University for their work on *Chitosan based formulations of atorvastatin for periodontal delivery*.

The prize to the best poster in the Pharmaceutical Technology area was chosen by a team of pharmaceutical scientists, including Dr. Angeles Heras Caballero (Spain), Dr. Carla Caramella (Italy), Dr. Marianne Hiort (Norway), Dr. Martin Peter (Germany), Dr. Francisco Goycoolea (Germany), and led by AAPS PharmSciTech Associate Editor Claudio Salomon (Argentina).

The committee evaluated all the posters according to the following criteria: quality of the research in terms of theoretical and methodological aspects related to Pharmaceutical Technology themes, excellence and innovation of the work presented, and added value of the research in terms of final formulation development.

The awardees received an invitation to submit their full paper on this topic to AAPS PharmSciTech for peer review and a one year e-subscription to AAPS, which includes access to all four AAPS journals—*The AAPS Journal*, *AAPS PharmSciTech*, *Pharmaceutical Research*, and *AAPS Open*—the *AAPS Newsmagazine*, the AAPS book discount code, archived webinars, e-posters from recent AAPS meetings, and more!

Congratulations to the AAPS PharmSciTech Poster Prize winners!

Dr. Claudio J. Salomon
Associate Editor AAPS PharmSciTech

Chitosan based formulations of atorvastatin for periodontal delivery

A. Işılray Doğan¹, G. Akça², S. Şenel¹

¹ Hacettepe University, Faculty of Pharmacy, Department of Pharmaceutical Technology, Ankara-06100, Turkey

² Gazi University, Faculty of Dentistry, Department of Medical Microbiology, Ankara-06510, Turkey

In recent years, statin group drugs are investigated for the treatment of periodontal diseases due to their anti-inflammatory effect. The efficacy of statins can be enhanced by local administration into the periodontal pocket by appropriate delivery system. The aim of our study was to develop a bioadhesive delivery system for atorvastatin for local treatment of periodontal disease. Due to the low solubility of atorvastatin, solid dispersions were prepared using different types of chitosan. 2 % atorvastatin was loaded into the formulations. The solid dispersions were then incorporated into chitosan gels. The viscosity and mucoadhesive property of the formulations was investigated in absence and presence of the drug. Release and permeation studies were performed in vitro. The compatibility and anti-inflammatory effect of the developed formulations was investigated using fibroblast cell lines.

Viscosity of the formulations was found to be suitable for application into the periodontal pockets. Both water soluble and base chitosan gels showed similar mucoadhesive properties. The release of atorvastatin was found to increase in presence of chitosan. Decrease in inflammation was found to be higher in presence of chitosan when compared to that with atorvastatin alone.

Acknowledgements: This study was supported by TÜBİTAK-SBAG-1001 program (114S758). Authors are thankful to Koyo Company, Japan for their generous gift of chitosan.

Minutes of the General Assembly of the European Chitin Society

A General Assembly of the European Chitin Society was held on 1st September, 2015 in Muenster University.

Topics

1. Minutes of the General Assembly 2013
2. President's Report
3. Secretary's Report
4. Treasurer's Report
5. Election of Members of the Board
6. Proposal for EUCHIS 2017
7. Various

President's Report:

Prof. Angeles Heras, the President of European Chitin Society, presented information on the Society activity during 2014-2015 related to introduction of the new logo and the web-site, travel awards for young scientists and the Braconnot Prize. Prof. Heras has also announced resignation of the EUCHIS Secretary Dr. J. Desbrieres due to his overwork.

The Jury formed by Prof. Caramela, Prof. Varum and Prof. Pintado has selected - out of 3 applicants - Dr. Jogi Madhupakash from Hyderabad (India), to receive the Braconnot Prize.

The Jury formed by Prof. Cabrera, Prof. Senel and Dr. Bratskaya has selected 6 awardees for travel grants - Michał Benedykt Kaczmarek (Poland); Elisa Sánchez Quesada (Spain); Espadin Dávila, Andrés Uriel (Mexico); Carmen Guadalupe Hernandez Valencia (Mexico); Shakeela Sayed (South Africa); Jesus Rojas Osnaya (Mexico).

Prof. Angeles Heras has emphasized importance of recognition of the former Presidents of the EUCHIS for their work and great contribution to the society. The ceremony would take part during the conference Dinner.

Prof. Angeles Heras announced that Proceedings from EUCIS conference in Porto 2013 will be issued soon. Prof. Manuela Pintado (Portugal) commented that the delay resulted from long procedure for receiving ISBN for the issue. Several articles were published in special Section in "Chitin and Chitosan Science, Vol. 1, pp. 197 – 259 (2013). URL: http://www.aspbs.com/jcc/contents_jcc2013.htm#v1n3.

Secretary's Report:

The secretary, Prof. Desbrieres, had asked earlier to relieve him of his duties because he could not attend the meeting due to an overload of work. Newsletter No. 34 was published in July 2013, edited by Prof. Jaworska, and No. 35 in August 2015, edited by Prof. Heras.

Treasurer's Report:

Prof. Francisco Goycoolea, presented the results of the status quo of the membership of EUCHIS, both by type of members and by country. At the present moment there are 139 active members of EUCHIS. Prof. Goycoolea commented that the overall number of members has not changed substantially from the data of 2013, although it dropped significantly from 2011 (176 members), so urgent actions are needed to increase the membership.

The financial record was not presented during General Assembly, since Prof. Francisco Goycoolea could not have it ready on time due to the organization of the EUCHIS conference. Prof. Goycoolea committed to prepare it in the nearest future and publish in the next Newsletter.

Prof. Goycoolea also asked the General Assembly to name two auditing members to approve the Financial Report. Katja Richter and Laurent David volunteered to audit the financial report. The General Assembly approved both candidates.

Prof. Goycoolea has pointed out to the General Assembly that the currently used process of keeping updated the membership data base and invoicing the annual fees is very inefficient and highly prone to human mistakes. Proposal of Prof. Goycoolea that a more automatic (perhaps online) method for both, keeping updated the data base and invoicing should be used was approved by the Assembly.

The Treasurer has informed the Assembly that the tendency of the finances of EUCHIS is following a downwards trend. He attributed this to the non-updated data base and to the inefficient invoicing. He commented that the platform used for the ICCC/EUCHIS 2015 conference, called "ConfTool" was very good and that perhaps it can be adapted for the purposes of the Society. He committed himself to explore this possibility and other options and obtain a price quote.

Prof. Francisco Goycoolea acknowledged the great help of Stefan Hoffmann, PhD student of his Group, who has taken the role of maintenance of the new website, of organizing the data base and helping with the Accounting.

Election of Board Members

According to the statute of the EUCHIS, Section III, part of the members of the Board of Directors must be elected every four-year period. This year five members stepped down from service: Prof. David (France), Dr. Desbrieres (France), Dr. Verena Seidl-Seiboth (Austria), Prof. Varlamov (Russia), and Dr. Suzana Vilchez (Spain).

As new members of the Board were proposed: Prof. Delair (France), Prof. Eijnsink (Norway), Prof. Moerschbacher (Germany), Prof. Peter (Germany), Prof. Sarmiento (Portugal), Prof. Skorik (Russia). The General Assembly voted unanimously for all nominations and re-elected Dr. Bratskaya, Prof. Caramella, Prof. Eroglu, Dr. Escribano, Prof. Goycoolea, Prof. Heras, Prof. Jaworska, Prof. Pintado, Mrs. Richter, and Prof. Simunek (Czech Republic) for period Sept. 2015 until Aug. 2017.

EUCHIS 2017 Conference

Prof. Heras suggested that the next EUCHIS conference shall be organized and take place in Spain, jointly with the next SIAQ meeting. The Language of the conference will be English. The Assembly has supported this proposal. Place and the date of the conference will be announced on EUCHIS website by the end of 2015.

Various

The proposal to change policy of separate collection of registration fee for EUCHIS conferences and membership fee was discussed. The Assembly has approved idea to introduce an option to include EUCHIS membership fee into invoice for the EUCHIS conferences registration payment.

Minutes of the Meeting of the Board

The meeting of the Board of the European Chitin Society was held on 1st September, 2015 in Muenster University, immediately following the General Assembly.

The only topic was election of the Committee of the Board. It was agreed that the election would be not by secret and votes would be by hand sign.

The Board reelected the President and two Vice Presidents of EUCHIS and elected the Secretary, Assistant Secretary, and Assistant Treasurer. Nominations for the President were suggested by members of the Board. Nominations for the Committee of the Board were suggested by the President. All nominations were approved unanimously. Therefore, the Board of EUCHIS for the period Sept. 2015 – August 2017 is as follows.

Committee of the Board

1. President: Angeles Heras (Spain)
2. Vice-President: Malgosia Jaworska (Poland)
3. Vice-President: Manuela Pintado (Portugal)
4. Secretary: Svetlana Bratskaya (Russia)
5. Assistant Secretary: Martin Peter (Germany)
6. Treasurer: Francisco Goycoolea (Germany)
7. Assistant Treasurer: Katja Richter (Germany)

Board Members

8. Francesca Cabrera Escribano (Spain)
9. Carla Caramella (Italy)
10. Thierry Delair (France)
11. Vincent Eijsink (Norway),
12. Hacan Ereglu (Turkey)
13. Bruno Moerschbacher (Germany)
14. Bruno Sarmiento (Portugal)
15. Jiri Simunek (Czech Republic))
16. Yuri Skorik (Russia)

Forthcoming Meetings

11th APCCS (Asian-Pacific Chitin-Chitosan Symposium)

shall take place in 2016 in India.

Further information will be published in due course in the web.

13th EUCHIS / 8th SIAQ Conferences (European Chitin Society / Sociedad Iberoamericana de Quitina)

shall take place jointly in 2017 in Madrid, Spain.

Further information will be published in due course in the web.

14th ICCS / 12th APCCS (International Chitin-Chitosan Conference / Asian-Pacific Chitin-Chitosan Symposium)

shall take place jointly in 2018 in Osaka, Japan.

Further information will be published in due course in the web.