

NEWSLETTER

Editor: Anayancy Osorio Madrazo, University of Bayreuth, Germany

E-mail: anayancy.osorio-madrazo@uni-bayreuth.de

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*Université Claude Bernard Lyon 1, Laboratoire Ingénierie des Matériaux Polymères
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Editorial

Although this Newsletter is published in 2025, it will be mainly dedicated to our last international event, the 14th International Conference of the European Chitin Society (EUCHIS), which was held together with the 1st Conference of the International Federation of Chitin and Chitosan Societies (IFCCS) in Siglufjörður, Iceland, from 11th till 14th September, 2023.

Three Poster awards were granted to the topics: "The Binding of YKL-40 to Heparan Sulfate is Regulated by Chitin Oligosaccharides" by Alexandra Grossdorf (page 17); "Synthesis of Macroporous Chitosan Sponges Using Trans-2-Hexanal" by Patricia Maria Esteve-Redondo (page 19); and "Chitotriazolan Derivatives for Antibacterial Activity" by Sankar Rathinam (page 21). The Prix Braconnot for outstanding PhD thesis in the field of chitin and chitosan research was recognized to Isabel Fraile Gutiérrez for "New devices from biomass of waste of aquatic origin for enzyme replacement therapy in hypolactasia" (page 23). Besides, EUCHIS gave financial support to Georgios Margoutidis, a young scientist from Italy, covering part of his expenses to travel to the conference (page 28). The conference program also included a Roundtable where the EUCHIS, the European Polysaccharide Network of Excellence (EPNOE) and industry (Heppe Medical Chitosan GmbH) discussed on polysaccharide research, applications and biomedical trends.

The Newsletter includes the Minutes of EUCHIS Board Meetings, General Assembly and newly elected Board members, the EUCHIS membership development of 2023 with a survey of members by country and status, as well as the announcement of coming events in the field of chitin and chitosan, for the different societies around the world which are members of the newly founded International Federation of Chitin and Chitosan Societies (IFCCS).

This Newsletter also reports about the Kickoff Meeting of the joint project Priority Program of the German Research Foundation SPP / DFG on the "Code χ – Chitin, chitosan and chito-oligosaccharides and their interaction with proteins of the extracellular matrix and cellular signaling (SPP 2416)", which was celebrated in Siegen, Germany 2024, with participation of many EUCHIS members as Principal Investigators and postgraduate students (page 40).

I wish you a good read and would like to thank to all who contributed to the content of the Newsletter.

Sincerely yours,

Anayancy Osorio Madrazo
Secretary of EUCHIS
Bayreuth, March 11th, 2025



Messages from the New President of EUCHIS, Prof. Laurent David

Dear EUCHIS members,

We publish this newsletter with a large delay after my election in September 2023. I hope 2025 will be a continuation for the full reboot of EUCHIS activities and influence.

First of all, I would like to thank the former and current EUCHIS Boards who prepared my election as the new President of EUCHIS. I am particularly indebted to Bruno Moerschbacher, Martin Peter and Katja Richer for their continued role and tenacity during the recent closure period, which was difficult for many learned societies. Hopefully, the new Executive Committee constituted by the President, Katja Richter as Treasurer, and Anayancy Osorio Madrazo as Secretary, will continue to work with the help and guidance of the previous team.

We had a wonderful EUCHIS meeting in Iceland, from September 11th to 14th, and again I thank Prof. Mår Måsson and his team for their vision and efforts in organizing the first EUCHIS meeting after the Covid period. It was very pleasing to see that delegates were so 'thirsty' for scientific discussion and exchange, which took place in an excellent atmosphere.

Nevertheless, a number of challenges remain. My first thoughts are with the youngest scientists in our community. They are the future of EUCHIS and we probably need to enrich our offer to them, in addition to the meeting scholarships, Braconnot and Poster prizes to recognize their work. Further, I hope to welcome young PhD and Post-Doc scientists to the first EUCHIS Summer School: *Characterization of ChitosanS*. It will be organized this time in Lyon, France from June 23rd to 27th, 2025.

My next announcement concerns the next EUCHIS meeting. It will take place in Murcia, Spain, from May 10th to 13th, 2026. It will be organized by Prof. Francisco M. Goycoolea and his team. After the success of the EUCHIS/ICCC/IFCCS meetings in Siglufjörður in 2023, in Sevilla in 2017, and in Münster in 2015, we are very confident that the EUCHIS' 2026 meeting will be a fantastic opportunity for new ideas and contacts. We decided to organize this meeting in 2026, since 2025 will also be animated by the 14th Asia-Pacific Chitin and Chitosan Symposium (14th APCCS 2025) that will be held from August 26th to 29th, 2025, at National Taiwan University, Taipei, Taiwan, and the Iberoamerican Chitin Society meeting, 16th International Conference on Chitin and Chitosan — 9th Iberoamerican Symposium on Chitin joint meeting that will be held in Hermosillo, Sonora, Mexico from October 26th to 29th, 2025.

Finally, I strongly encourage you to renew your subscription to EUCHIS this year (<https://euchis.org/>), whose fees have remained constant and very economic for years, and to encourage especially young researchers in your laboratories to become EUCHIS members.

Laurent DAVID,

President of EUCHIS



Messages from the Former President of EUCHIS,

Prof. Dr. Bruno M. Mörschbacher



Dear EUCHIS members, dear friends,

I am still filled with the wonderful experiences and memories of our conference in Siglufjörður in awesome Iceland. How good to finally meet some of you in person again – then only one realizes how much one has missed this direct interaction – touching people, laughing with them, eating and drinking together. As I mentioned in my Opening Remarks during the meeting, this was my first and only conference as President of EUCHIS, and that also made it special to me. I was literally busy day-round, with rarely five minutes of rest, and never more than four hours of sleep. It was the wonderful ice-cold – Icelandic-cold! – shower in the morning that started my day; the welcoming atmosphere our hosts had created and the smiling faces of you, our EUCHIS members, and the many guests who came to our meeting that kept me going through the day; and the magic of the Northern lights that brought calm to my soul for the night. I am grateful. It was a blessing.

All seemed well – but not all is perfectly well. Our society is still in good shape, both financially and with a membership of around 70 chitin and chitosan enthusiasts from Academia and Industry, from Europe and abroad. But given the crucial role polysaccharides will have to play in the ongoing transition from a wasteful petrol-based economy to a circular, sustainable bio-economy, given the extraordinary possibilities which chitins and chitosans offer for this transition, given the interest of politics and society in this transition and the growing interest of scientists and product developers in these fascinating, functional biopolymers, their poorly understood natural roles and their possible biotechnological applications – given all this, 70 is by far not enough!

Why is this so? Why do we not attract more members? One reason of course is the pandemic and the long gap in conferences – conferences are always opportunities to win new members, in particular doctoral and post-doctoral, young scientists. But I doubt this is the main reason. Our membership fee is low, almost ridiculously so, it has not increased since the starting days of EUCHIS, thirty years ago (we missed our thirtieth birthday last year when we had to postpone and relocate our planned conference in Russia – what a pity). This cannot be the reason, either. Perhaps, times have changed; perhaps, people have changed. We have no urge anymore to be a member of a society, a club, a political party, not even a church, simply for the fact of being a member, of belonging to a community. We are more individualistic. We are members of many organizations – but we want a profit, a benefit from being a member. So far, the only profit EUCHIS membership offers is a discount when joining our conferences – typically just slightly more than the two years membership fees required to be eligible for the discount. That is not enough of an incentive, especially if the conference fee is paid by the employer while the membership fees are paid privately. We have introduced Student Bursaries and Travel Awards for students but of course, they are few in number and small in amount, and not well advertised (my apologies here: I was made aware during the conference that there is too little information on our website, and that what is there, needs updating). We need to come up with more benefits. This is not a new idea, and we have discussed options to do so during the Board Meetings and

the General Assembly in Siglufjörður. It will be one of the most important challenges for the new Board and the new President, Prof. Laurent David from the University in Lyon, France. Laurent has been a member of our Society, and also of its Board, since many years, and he has been among the most active Board members during my tenure as a President. This is why I am happy he has agreed to take over, and I know he will take action. My wish would be that you, the members, support him – do send to him your ideas on how to increase our membership, on how to add benefit to being a member.

And why did we have more than 100 delegates at our meeting in Siglufjörður, but far less than 70 of them were EUCHIS members? Why did I meet only some, and not all of you in Siglufjörður? During the General Assembly, only eleven members were present, six of them members of the old Board, three of them members of the new Board. Where were all the others? Where were you? I think I do not need to tell you – but perhaps I do need to remind you, after the long years of the pandemic – that nothing, nothing compares to the experience of a scientific conference dedicated to the molecule that is closest to your researcher's heart. This is true for all of us, but even more vividly so for young researchers who during the pandemic, were deprived of the experience. If you were not there, you missed a lot. You missed exciting science and intense discussions, revealing insights and challenging ideas, big hugs and warm smiles, awesome days and magic nights, Northern lights and even a meteor... Make sure not to miss it again. Our next meeting will be in Murcia, in Spain (no Northern lights to be expected, but Southern nights), in 2026. I am already looking forward to it. And I am looking forward to you, all of you!

And then there is our Newsletter. Typically, twice a year, it is distributed via E-mail to all members, and openly published on our website – which is good as it is meant as an instrument of communication within our Society and, equally importantly, also to the world beyond (but of course, thus, it is not an incentive to become a member). The Newsletter is the responsibility of the Secretary, and I have been more than fortunate that during my tenure, this was Prof. em. Martin Peter from the University in Potsdam, Germany. Martin has not only made sure the Newsletter appeared regularly and conveyed the most important information to all of us, he also meticulously collected and published a list of publications from our members. However, there was little more than that in the Newsletters of late – because there was no input from you, our members. Of course, the Newsletter is not intended for scientific publications. Our Newsletter is intended as a means of communication, of exchanging ideas and opinions between us as members, and between us and anyone else in the world sharing our interest in chitins and chitosans. But it does not work. There is no exchange. During the pandemic, when the labs were closed, I asked my undergraduate students to perform a small survey on the quality of chitin and chitosan related publications – and even they, beginners in the field of science and not yet familiar with publication, were not convinced of what they found. Too many papers still appear without any information on the chitin or chitosan used in the study, making it impossible to reproduce the work and confirm – or disprove – the results. A waste of time and energy. We published these results, and our opinion regarding them, in the Newsletter, hoping to spark a discussion, but nothing happened. I was not surprised, but still disappointed. We have since performed a much more thorough meta-analysis on papers dealing with structure-function relationships of the antimicrobial activities of chitosans which we have published 'properly' in a scientific journal, hoping for more of a response. But perhaps, we can try to resuscitate our

Newsletter with more input from you, our members. Another challenge for the new Board and the new Secretary. When I asked Laurent whether he would be willing to act as EUCHIS president, I recommended that before accepting, he should make sure to find a potential Secretary with whom he can closely and trustfully collaborate. He asked Prof. Anayancy Osorio Madrazo, then at the University of Jena, and currently at the University of Bayreuth, both in Germany, and she immediately agreed. They know each other well, and I know both of them a little. I am sure they will be a strong and successful team. The Newsletter will now be Anayancy's responsibility. But she can only succeed with your support. Please, all of you, or at least some of you, do start contributing to our Newsletter. Perhaps start by sending the abstracts of theses produced in your group (you can modify them appropriately, if you do not want to share all of your secrets). And use it to exchange opinions, something that is missing in scientific papers where we publish results, not opinions.

My frustration over the still widespread ignorance of authors and editors concerning the need to give at least basic information on the source and structural properties of any chitin or chitosan used has been one of the driving forces for my ambition to revive the decade-old idea of founding an International Federation of Chitin and Chitosan Societies, IFCCS. As such, IFCCS could try and speak with one voice to editors of important journals, convincing them that papers dealing with chitin or chitosan need to follow certain minimal quality requirements. With the help of Martin Peter who has advocated this idea of an IFCCS repeatedly, but with little success in the past as the time apparently had not yet come for the idea, I easily convinced Prof. Hiroshi Tamura from the University of Osaka, Japan, the organizer of the last APCCS / ICCS in 2018, to invite as many Presidents and Chairs or Speakers of chitin and chitosan societies as possible to a meeting during the conference, in which we discussed the options for this idea. The attendance was very good, and the response to our initiative was very positive. Unfortunately, the pandemic has slowed down this activity, but we worked out a schedule for the international chitin and chitosan conferences EUCHIS, APCCS, SIAQ, and ICCS – as a consequence, the ICCS in Iceland was also the first IFCCS meeting, to be followed by the second IFCCS organized jointly with APCCS in Taiwan, in 2025, and the third IFCCS organized by SIAQ in Hermosillo, Mexico, also in 2025. We met again in Siglufjörður, in a much too short meeting. But we all know that such personal meetings serve to build trust and confidence much more than to do real practical work – this can then be done by mail. We will now have to define the legal status of IFCCS and draft Bylaws. I will continue working towards this goal, knowing to have the support of our new President as well as that of the colleagues from other societies who are equally interested in its success. But the success will again depend on initiatives of the members. As IFCCS, we will, hopefully, have more visibility and impact. But it does not come without effort, without activities – your activities.

I became painfully aware of the lack of impact we have, EUCHIS has, when I learned, in Iceland, that the authorities of the European Union in Brussels are currently working on a new Pharmacopeia for chitosan. Both the EU and the US pharmacopeias are old and need updating, no doubt. But the initiative, as usual, came from companies. Not surprisingly, thus, it was Dr. Katja Richter, CEO of Heppe Medical Chitosan GmbH in Halle, Germany, who brought up this topic during our conference. There is, of course, nothing bad about companies initiating the process of updating regulations that govern the registration of products for the markets. But this is also dangerous. The problem is that of course, any company tends to try and influence the

regulations in such a way that it profits maximally from them (and that competitors suffer maximally) – this is business, after all. But the regulatory agencies need to do their job independently, they need to take the needs of society and industry as a whole into consideration. You should think, then, or at least hope that the regulatory bodies would contact independent scientists to help them take knowledge-based, independent decisions. Would it not have been logical that they contact the European Chitin Society when discussing about how to update the European pharmacopeia on chitosan. Well, so far, they did not. But perhaps, we should not complain. We were aware that the pharmacopeia is old and needs updating, but we did not initiate this process with the authorities. We left it to companies. Shamefully, we were not even aware the process had been initiated. We need more communication between EUCHIS members from Industry and Academia. And we need to act. We need to contact the authorities. We need to make sure the new pharmacopeia reflects the current state-of-the-art in the science of chitins and chitosans, addressing the needs of chitin- and chitosan-related industry, but independent of any particular industrial interests. In Siglufjörður, we decided to do so. Another important job for the new President and Board.

I did not want to look back, but to look ahead. But when I do look back on my much too long six years of presidency, I do so with a little pride (to have been considered worthy of being President) and a lot more humility and modesty (for having achieved little and for leaving a lot to my successor). But mostly with gratitude. I am grateful to all members, old members who have been loyal to their society through the years without conference, and young members who have joined our society despite the lack of conferences. I am grateful to the members of the Board who have supported all efforts we tried: grateful to those who have since left the Board, Francisca Cabrera-Escribano, Thierry Delair, Vincent Eijsink, Massimiliano Fenice, Angeles Heras, Yuri Skorik, and Gregor Tegl (a special thank you for the idea to offer EUCHIS webinars, and for organizing them – we need a volunteer as a successor!); grateful to the Vice-Presidents, Inmaculada Aranaz and Svetlana Bratskaya (a special thank you for offering to organise, jointly with the Russian Chitin Society, the EUCHIS meeting in 2020, and then again in 2021 in Kazan, when we had to postpone due to Corona) on whose expertise and opinion I could always fall back; grateful to our Treasurer Katja Richter who certainly has the most demanding of jobs within the Board (for instance when having to remind us to pay our fees!); grateful to those who continue serving on the Board, Inma (who will continue being Vice-President) and Svetlana, Katja and Laurent, Oscar Goni, Francisco Goycoolea, Már Másson (who will now serve as Vice-President; a special thank you to accept organizing the magic EUCHIS meeting in Siglufjörður when we had to relocate it due to the Russian war against Ukraine), Marcin Struszczyk, and Gustav Vaaje-Kolstad; grateful most of all to our Secretary, Martin Peter. I had only accepted to be President when Martin promised he would be Secretary. He kept his promise to do all the work that needed to be done. I suggested to honour him by making him our Honorary President, the Board supported that suggestion, and you, the Members, during the General Assembly, then finally and unanimously agreed to it. It is against his will that he is now joining the row of eminent scientists and supporters of our Society – to Martin, titles are not important. Science is, and friendship is. Thank you, Martin, thank you all. See you in Murcia, at the latest,

Bruno

14th EUCHIS/ 1st IFCCS, Iceland 2023



Aurora EUCHIS' 2023, Siglufjörður, Iceland. *Courtesy of Laurent David, President of EUCHIS*

The 14th International Conference of the European Chitin Society (EUCHIS' 2023) in Siglufjörður, Iceland was the first joint event with the International Federation of Chitin and Chitosan Societies (1st IFCCS). The Chairperson was Prof. Már Másson of University of Iceland (new Vize-President of EUCHIS), who together with the Local Organizing Committee including the Universidad of Iceland, Ministry of the Environment, Energy and Climate, Iceland, companies like Primex Iceland and Genis focusing on chitin and chitosan production and product development, and the great support of the local community of Siglufjörður, organized a fantastic event. This “warmy” scientific meeting was accompanied of amazing social activities that only could happen at Iceland landscape including its fishery traditions. This international conference was also honored by the presence of personalities like the Rector of the Universidad of Iceland Prof. Prof. Dr. Jón Atli Benediktsson, and the Minister of the Environment, Energy and Climate, Iceland Guðlaugur Thór Thórdarson.





Conference opening by Chair of organizing committee Prof. Dr. Már Másson (l.), Rector of the University of Iceland Prof. Dr. Jón Atli Benediktsson (r.), and former President of EUCHEIS Prof. Bruno Mörschbacher.

The scientific program encompassed five Keynote Lectures, invited Talks and peer-reviewed Oral and Poster presentations, distributed in three nowadays relevant themes in the field of chitin and chitosan research. Three Poster Awards were granted as well as the Prix Braconnot for PhD thesis, and a conference Travel award. Besides, parallel symposia, General assembly and Board meetings of EUCHEIS and IFCCS took place during the event.

Keynote Speakers:

- 1) *Koro de la Caba* (Basque Country) talked about alternative biowaste sources to develop sustainable chitin- and chitosan-containing biocomposites.
- 2) *Anayancy Osorio Madrazo* (Germany) presented the biofabrication of chitosan / cellulose nanofibers hydrogels by 3D printing for the development of bioinspired, mechanically performant, biocompatible and biodegradable constructs for tissue engineering.
- 3) *Hiroshi Tamura* (Japan) discussed about the preparation and biomedical application of polysaccharide based PEC gel using chitosan base solution.
- 4) *Jayanta Haldar* (India) talked about unleashing the potential of chitin/chitosan derived glucosamines against drug-resistant microbes.
- 5) *Rangasamy Jayakumar* (India) presented about chitosan-based hybrid hydrogels in rapid bleeding control.

Here below are some memories with pictures of the invited Keynote speakers.





Memories of Keynote lectures by Prof. Anayancy Osorio Madrazo (*top-left*), Prof. Hiroshi Tamura (*top-right*), Prof. Jayanta Haldar (*bottom-left*), Prof. Rangasamy Jayakumar (*bottom-right*).

The invited and selected Oral presentations were given in thirteen sessions distributed along the three relevant themes:

Thema I: Chitin and chitosan to improve health and well-being

Thema II: Chitin and chitosan to support the circular economy and climate action

Thema III: Chitin and chitosan in the natural environment

Closer details to the conference moments will be given below in different sections, including two Personal Accounts of: (*i*) the former President of EUCHIS and (*ii*) the Chair of EUCHIS 2023; research Summaries and Bibliographies of winners of Poster Awards, of Prix Braconnot for PhD thesis, and of conference Travel Award.

A Personal Account of Former President about 14th EUCHIS/ 1st IFCCS in Siglufjörður, Iceland

When I close my eyes, I can still see her, magic, mystic, majestic – the aurora. For one week, we had no clouds in the sky, pure sun every day, from sunrise to sunset, and the most awesome, gorgeous, beautiful Northern lights until long past midnight every night. The organizers of our first post-pandemic meeting, the 14th International Meeting of the European Chitin Society EUCHIS' 2023 together with the 15th International Chitin and Chitosan Conference ICCS which was also the 1st meeting of the International Federation of Chitin and Chitosan Societies IFCCS, Prof. Már Másson and his team, supported by Sóti Summits, truly must have special connections to Odin or whoever is responsible for the weather in Iceland. But not only that. As the president of EUCHIS since six, mostly pandemic- and war-stricken years, I felt a special responsibility to help making this conference, the first and only one during my tenure which ended here, a success. And admittedly, I was a little nervous in between, being so far away in Germany from where the conference was going to be held – Siglufjörður. I shouldn't have been worried. Everything was just perfectly organized. Even travel to and from the end of the world, the Northernmost town in Iceland and, thus, almost in Europe, was less demanding than feared by many, and any irritation that may have occurred was wiped away the moment we arrived in small and charming Siglufjörður. Not only the welcoming little houses surrounding the fishing harbor, all painted in bright primary colors, in which our conference was going to be organized, would have lifted the mood in every weather; for us, they were competing with the brilliantly blue sea and sky, and with the fresh snow high up on the mountains in the distance, about who would be more shining in the sun. More importantly, we were welcomed like family, with a bright smile and a humor we hadn't expected in a country most of us had imagined as being rather harsh, cold, and dark. None of that! Not even during the social activities, such as a guided hike into the surrounding mountains, with vividly presented stories – some dramatic, some funny, but all of them guaranteed to be true to their core – about past and present life in Siglufjörður. Other colleagues returned from a boat tour with a proud smile on their face (even days later) after having caught their first fishes. And most of us joined the Tip of the Troll Peninsula bus tour in which more family secrets of Siglufjörður and its community, Fjallabyggð, were revealed.

Of course, the scientific program organized by our colleagues from Iceland, supported by an International Advisory Board, also contributed to the success of our conference. We were a little over 100 participants – thus increasing the population of Siglufjörður by almost 10%! Apart from a few tourists and locals, almost everyone we encountered in “town” was a colleague and participant in our conference; Siglufjörður being as small as it is, with the fjord on one side and the mountains on the other, allowed no-one to escape. But it was the warm hospitality along with the warm weather (10 °C in fact, but it felt like almost 20 °C) which established the bright mood of the conference from the start, and kept it alive throughout. Already the welcoming reception in the local brewery set the scene. Little by little, the delegates arrived in Siglufjörður and found their way to the reception, many of them our colleagues and some of them our friends for many years. We hadn't met for years, since before Corona, and

this had left us hungry for real-life meetings, and satisfying this craving contributed to the very special atmosphere of the conference. But we were equally happy about each and every new face, many of them young, some of them on their first conference ever, and all of them with high expectations and full of curiosity. I am convinced: they were not disappointed but rather, they were enthralled and excited, and they are now even more enthusiastic than ever to be part of the chito-family, this small but vigorous community consisting of an interdisciplinary mix of scientists from both Academia and Industry dedicated to unravel the wonders of chitins and chitosans, and to exploit their potential to the benefit of a more sustainable future for our planet, and ourselves. Our planet needs these young and eager scientists, and so does EUCHIS.

We had a busy scientific program. The sessions started at 8:30 in the morning, coffee breaks never lasted more than 30 minutes, lunch break a short hour. Apart from the opening and closing ceremonies, the greeting by the Minister of the Environment, Energy, and Climate of Iceland who also presented the poster prizes, a few plenary lectures and the final Round Table Discussion on “Polysaccharide Analytics: Challenges, Opportunities, and Future Perspectives in Research and Industry”, we had parallel sessions, so that I could listen to half the presentations only. But what I heard, was mostly very good, and not a single presentation was so poor that I would have regretted listening to it – and it has not always been like this in the past! There were two poster sessions, with one hour each both too short to really appreciate the many posters – admittedly, the room was so packed with people that I managed only short glimpses of some, and not even half of the posters. Perhaps it will be a good idea to ask the poster presenters as well as the oral presenters whether they are willing to make their presentations available on an internal, secured EUCHIS website accessible only to EUCHIS members. This conference being not only a EUCHIS meeting but at the same time an ICCC / IFCCS meeting, we had plenary presentations by EUCHIS members as well as by some distinguished international guests. And to begin the collaboration with the European Polysaccharides Network of Excellence EPNOE on which we had agreed during a recent zoom meeting between Board members of EUCHIS and EPNOE, the final Round Table discussion, expertly chaired by Prof. Már Másson, convened the EPNOE president Prof. Pedro Fardim from the University of Leiden, myself as (by then ex-) President of EUCHIS, and Dr. Katja Richter, CEO of Heppe Medical Chitosan GmbH and at the same time Treasurer of EUCHIS.

As President of EUCHIS, I personally had an even more demanding program than anyone else, I guess. Of course, I had to give the Opening Address on Tuesday morning –a real and heart-felt pleasure rather than a duty! During the lunch session on that day, I presided over the meeting of the outgoing Board, skillfully prepared by our Secretary, Prof. Martin Peter who, very unfortunately, was not able to join our meeting. It contained the Reports of the President, of the Secretary, and of the Treasurer, we prepared the General Assembly, and we discussed some issues, most importantly the venue for the next conference and the activities towards founding the IFCCS. On Wednesday, apart from giving my own scientific presentation and happily, proudly listening to those of two of my team members, we had the EUCHIS General Assembly during lunch. Apart from receiving and accepting the different reports and discharging the Board, the EUCHIS members elected the new Board which, as stipulated by our Bylaws, consists of half old and half new Board members. The main point of discussion during the General Assembly was the need to recruit new members as during the pandemic, we had too

few student members joining due to the missing conferences. We discussed ways to generate more benefits for members – such as the internal “members only” EUCHIS website which we could start *e.g.* by presenting the oral and poster presentations of our meeting. Another important suggestion was to organize Workshops for members, in particular student members, and we discussed that this might best be done in collaboration with the other societies which are going to be members of the IFCCS. Perhaps most importantly, the EUCHIS members enthusiastically applauded the suggestion of the old Board to make Prof. Martin Peter Honorary President of EUCHIS!

The General Assembly was immediately followed by the meeting of the new Board during which the members of the Committee of the Board were elected. First of all, Prof. David Laurent from the University in Lyon was elected president, making me finally ex-President! He will be supported by Prof. Anayancy Osorio from the University of Bayreuth as Secretary, as Prof. Martin Peter had announced that he would step down from this responsibility. We all – but most of all I myself – owe him so much for all his efforts for EUCHIS! Katja Richter from Heppe Medical Chitosan GmbH was confirmed as Treasurer, and I accepted to be Assistant Treasurer. Prof. Hans Merzendorfer will be Assistant Secretary, Prof. Inmaculada Aranaz will remain one of the two Vice-Presidents while Prof. Már Másson accepted to be the other Vice-President. We then continued the discussions on the venue for the next conference as well as the foundation of the IFCCS, to allow for a smooth transition from the old to the new Board. On Wednesday evening, after the trip of the Troll Peninsula bus tour, we met in the Herring Museum for a Reception with Champagne during which the local “Herring Girls”, the youngest one barely seven years old, enchanted us with some of the traditional songs the women had been singing during herring salting in the heydays of Siglufjörður. This award-winning museum is really something very special and worth visiting, not least as it embodies the decision of this town not to cry over the lost glory of the herring days when Siglufjörður was the Klondike of the Atlantic, but to proudly look back on their history while at the same time preparing for the future, and actively shaping it. Impressive and exemplary! Afterwards, during the Gala Dinner, I had the pleasure to be on stage again, to greatly thank all the organizers for their heavy work during the past year in preparing and during the past week in running this extraordinary conference. I also informed the participants of Prof. Martin Peter’s election to Honorary President of EUCHIS, then handed over officially –with a sigh of relief and a little melancholy – the presidency of EUCHIS to Prof. Laurent David. I was too exhausted to really appreciate the excellent music by a local band, and to dance away the night as others, mostly younger chitinists and chitosanists did.

But then, on Thursday during lunch, I had invited Prof. Hiroshi Tamura from Kansai University, Prof. Shinsuke Ifuku from Tottori University, both in Japan, and Prof. Rangasamy Jayakumar from the University in Cochin, India, as speakers for the Asia-Pacific Chitin and Chitosan Symposium APCCS, as well as Prof. Inmaculada Aranaz from the University in Madrid and Prof. Francisco Goycoolea, then at the University in Leeds, UK, and currently at the University of Murcia in Spain, as representatives of the Ibero-American Chitin Society SIAQ, along with some members of the new EUCHIS board, most importantly the new President Prof. Laurent David, to discuss the next steps towards founding the IFCCS. We spent most of our much too short time in discussing the schedule for future chitin and chitosan conferences so that we had

to postpone the decision on who would be in charge of drafting Bylaws for IFCCS to future, online meetings. All these meetings kept me very busy and a bit tense, while nonetheless happy and excited. Still, after having discussed with the other panelists during the final Round Table, I was happy to simply sit in the audience when our new President announced the winner of the Braconnot price for an excellent PhD thesis – Dr. Isabel Fraile from the University in Madrid, and gave the Closing Remarks for this year’s conference, inviting everyone to the next EUCHIS meeting in Murcia, Spain, in the Spring of 2026.

Perhaps you will ask: How on earth did they come up with the idea to hold a meeting in Siglufjörður, of all locations? And how did they know it would be such an extraordinary, stunning, breathtakingly beautiful location for a EUCHIS / ICCS / IFCCS meeting, how did they dare to believe it could compete with former venues such as Sevilla, St. Petersburg, Lyon, Porto, Venice, and even Münster? Well, Iceland had been my suggestion, a boyhood dream after an Aunt of mine had visited the island in the 60s and brought back pictures of volcanoes and geysers. But Siglufjörður was the decision of our Icelandic colleagues and main organisers of the conference, Prof. Már Másson from the university in Reykjavik, an expert in chitosan derivatives, and Dr. Héléne Lauzon from the chitosan producing company Primex located in – Siglufjörður! Believe it or not, this little town does not only have a splendid past as the herring capital of Iceland, it is also reinventing itself with a fledgling tourist industry, and a small, but firmly established biotech industry. Next to Primex, there is also Genis – both among the three platin sponsors of our conference (alongside the fishing company Ísfélag, also located i.a. in Siglufjörður) – which is biotechnologically converting chitosans from Primex into successful food supplement products. Both of these companies owe their foundation and growth to some extent to Prof. em. Martin Peter, former president, (now also former) Secretary of EUCHIS, and now the new Honorary President of EUCHIS. And so, partly thanks to chitin and chitosan, entrepreneurial former students of Martin are helping to give Siglufjörður a future – what better reason could we have to meet there.

That our choice had been a good one, I think all the participants will enthusiastically applaud. And even the Gods approved: they sent a meteor streaking right through our first aurora, brightly illuminating the sky and glowing for what seemed endlessly long seconds. What a sight, and what a sign! Siglufjörður – we’ll see you in our dreams...



A Personal Account of the Chair of EUCHIS' 2023 and Organizing Committee, about 14th EUCHIS/ 1st IFCCS in Siglufjörður, Iceland

The 14th International Conference of the European Chitin Society (EUCHIS 2023) & The 15th International Conference on Chitin and Chitosan (15th ICCS) / 1st Conference of the International Federation of Chitin and Chitosan Societies was held in Siglufjörður, Iceland, from September 11th to 14th, 2023. This marked the first European and International in-person conference since the 13th Euchis Conference in 2017 in Seville, Spain, and the 14th ICCS conference in Osaka in 2018.

The six-year gap between the 13th and 14th EUCHIS conferences, significantly shaped by the COVID pandemic, brought profound changes to scientific communications and education through the widespread adoption of web-based tools, electronic meetings, and the use of electronic lectures. This period also revealed the limitations of these tools. While electronic conferences offer low cost and convenience, the absence of personal contact and in-person interaction is a severe drawback, limiting the value of such events. The prolonged isolation and minimal travel caused by the pandemic underscored the significance of the 14th EUCHIS conference but also presented a challenge as the landscape in scientific communication had evolved.

Initially, the conference in Iceland was planned as the 15th conference for 2024. However, following the cancellation of the meeting in Kazan in spring 2022, the Icelandic EUCHIS members from the University of Iceland and Primex ehf were requested by the EUCHIS Board to reschedule the Icelandic conference to 2023. The organizers faced challenges due to the typically required two-year organization timeframe and the changes brought by the pandemic, including the uncertainty of participation and the need to adapt to an environment where electronic communication plays a more prominent role.

Our first task was selecting the most suitable venue. After careful consideration, we chose the fishing town of Siglufjörður in the North of Iceland over the usual location in the capital city of Reykjavík. Siglufjörður was selected partly because it is the location of Primex and the production site for chitin and chitosan in Iceland and partly because of its unique geographical and historical significance. The town, situated in a small, narrow fjord on Tröllaskagi, forming the northern tip of Iceland, was historically only accessible by sea in winter until the construction of modern road tunnels.

Despite its previously inaccessible location, Siglufjörður played a significant role in Iceland's economic history due to its proximity to major fishing grounds. This history, along with the town's recent growth and its importance in the marine biotechnology sector, particularly with companies like Primex and Genis focusing on chitin and chitosan production and/or product development, presented a unique backdrop for the conference.

The organizing committee, including myself (Már Másson), Dr. Hélène L. Lauzon, Sigríður Vigfúsdóttir, Guðrún Sif Guðbrandsdóttir from Primex, and Ólöf Ýrr Atladóttir from Sóti

Summits, faced considerable challenges in logistics, accommodation, and ensuring a memorable experience for attendees. The small size and isolation of Siglufjörður, however, helped create an instant community among conference guests, facilitating personal contact and communication.

Announced in January 2023, the conference set a submission and registration deadline for April, ultimately drawing 120 participants from 18 countries. The program was meticulously designed to align with the United Nations Sustainable Development Goals, highlighting three pivotal themes: Chitin and Chitosan to Improve Health and Well-Being, Chitin and Chitosan to Support the Circular Economy and Climate Action, and Chitin and Chitosan in the Natural Environment. This thematic structure allowed for a comprehensive exploration of the material's applications across diverse fields. Keynote addresses were delivered by Professors Koro De La Kaba, Anayancy Osorio-Madrado, Rangasamy Jayakumar, Jayanta Haldar, and Hiroshi Tamura, whose insights were very well received by the participants. The program featured 45 lectures across 13 sessions and showcased 29 posters, collectively highlighting groundbreaking advancements in chitin and chitosan research—from isolation and manufacturing processes to applications in biology, analytics, chemistry, material science, and sectors like medicine, agriculture, nutraceuticals, and construction. The attendees' positive feedback reflected the scientific program's high level and concentrated focus. Furthermore, the conference program included a European Polysaccharide Network of Excellence (EPNOE) round table on polysaccharide analytics. This session, featuring Dr. Katja Richter, Bruno Moerschbacher, and Professor Pedro Fardim as panelists, addressed challenges and opportunities within the field. The round table also initiated a closer collaboration between EUCHIS and EPNOE to advance polysaccharide research.

At the closing ceremony, the Minister of the Environment, Energy and Climate, Mr. Guðlaugur Þór Þórðarsson, honored us with his presence and presented the awards for the best posters. The first poster prize was awarded to Alexandra Großdorft for her work titled "The Binding of YKL-40 to Heparan Sulfate is Regulated by Chitin Oligosaccharides." The second prize was bestowed upon Patricia Maria Esteve-Redondo for her poster "Synthesis of Macroporous Chitosan Sponges Using Trans-2-Hexanal", and Sankar Rathinam claimed the third prize for "Chitotriazolol Derivatives for Antibacterial Activity." The Prix Braconnot for outstanding PhD thesis in the field of chitin and chitosan research was granted to Isabel Fraile Gutiérrez for "New devices from biomass of waste of aquatic origin for enzyme replacement therapy in hypolactasia". These awards and all presented posters and lectures recognized the innovative research within our community and underscored the diverse applications of chitin and chitosan. Concluding the ceremony, an address by the newly appointed President of EUCHIS, Professor Laurent David, alongside Professor Francisco M. Goycoolea and Inmaculada Aranaz Corral, introduced Murcia, Spain, as the venue for the upcoming 15th EUCHIS conference.

To conclude, EUCHIS 2023 delivered a fulfilling experience for everyone involved, setting the stage with anticipation for our next gathering in Murcia, Spain.

Már Másson

Vice-President, EUCHIS

EUCHIS' 2023 Poster Awards

1st Poster Prize

THE BINDING OF YKL-40 TO HEPARAN SULFATE IS REGULATED BY CHITIN OLIGOSACCHARIDES

Alexandra Großdorf^{a*}, Tobias Obser^a, Ewa Wladykowski^a, Bruno M. Moerschbacher^b,
Anayancy Osorio-Madrado^c and Christian Gorzelanny^a

^a University Medical Center Hamburg-Eppendorf, Department of Dermatology and Venereology, Hamburg, Germany

^b University of Münster, Institute for Biology and Biotechnology of Plants, Münster, Germany

^c University of Bayreuth, Chair of Additive Processes Tissue Reconstruction – Organ Printing, Bayreuth, Germany

E-mail: a.grossdorf@uke.de



Ceremony of poster award. *f.l.t.r.*: H el ene L. Lauzon (Organizing committee), Guđlaugur Th or Th ordarson (Minister of the environment, energy and climate, Iceland), Alexandra Grossdorf (First poster award).

Depending on its molecular properties such as the degree of acetylation or pattern of acetylation, chitin and chitosan is thought to have inflammatory or tissue regenerative properties in humans. Chitinases, highly conserved enzymes expressed by most organisms, including mammals, seem to be fundamentally involved in the recognition and processing of chitin and chitosan. It is generally known that the acidic mammalian chitinase and chitotriosidase are capable of cleaving chitin, whereas other members of the family such as Chitinase-3-like protein 1 are enzymatically inactive and only able to bind chitin. Chitinase-3-like protein 1 is also known as YKL-40. Previous research has shown that the expression levels of YKL-40 are increased in various diseases such as asthma, Alzheimer's disease, and cancer. In addition to its potential function as a biomarker indicating disease severity, YKL-40 can regulate inflammatory processes such as immune cell recruitment, cell migration and angiogenesis. These biological functions have been linked, at least in part, to the ability of YKL-40 to interact with heparan sulfate. Heparan sulfate is a linear polysaccharide exposed by

proteoglycans on most mammalian cell surfaces and involved in growth factor or cytokine signaling. Recent molecular dynamics simulations suggest that YKL-40 has two distinct binding sites for chitin and heparan sulfate.

In the present study, we aimed to confirm the existence of the two binding sites and to determine whether the interaction with heparan sulfate is affected by the simultaneous binding of chitin oligosaccharides. We used single-molecule force spectroscopy and fluorescence spectroscopy to characterize the interaction of YKL-40 with various chitin/chitosan oligosaccharides and heparan sulfate. In control experiments, we used YKL-40 mutants lacking the putative binding sites for heparan sulfate or chitin.

Our data suggest that chitin or chitosan oligosaccharides can be used to regulate the biological function of YKL-40 and that they might have the potential to tune YKL-40-mediated pro-inflammatory processes. Further studies with human cells will be conducted to prove the biological relevance of our findings. We anticipate that these experiments will provide new insights into the role of YKL-40 during inflammation and could lead to the development of new drugs for related diseases.

Alexandra Großdorf earned her bachelor's degree from Gottfried Wilhelm Leibniz University Hannover in 2021 and received a Master of Science degree in 2023 at University Hamburg. In the early stages of her academic journey, she earned her 1st Poster Prize at EUCHIS' 2023 in Iceland, where she presented data derived from her master's thesis. Subsequently, Alexandra began her PhD, becoming a member of Christian Gorzelanny's research group at the University Medical Center of Hamburg-Eppendorf, Germany. Her current research is embedded into the Priority Program SPP 2416 (CodeCHI) funded by the DFG German Research Foundation.

2nd Poster Prize

SYNTHESIS OF MACROPOROUS CHITOSAN SPONGES USING TRANS-2-HEXENAL

Esteve-Redondo, P*, López de Dicastillo, C., Gavara, R., Hernández-Muñoz, P.

Instituto de Agroquímica y Tecnología de Alimentos (IATA-CSIC), Paterna, Spain

E-Mail: pesteve@iata.csic.es



Ceremony of poster award. *f.l.t.r.*: Hélène L. Lauzon (Organizing committee), Gudlaugur Thór Thórdarson (Minister of the environment, energy and climate, Iceland), Patricia Esteve-Redondo (Second poster award).

Hydrogels constitute a growing field of research on the uses of chitosan for different applications ranging from food packaging to tissue engineering [1]. Glutaraldehyde has been commonly used to obtain chemical hydrogels of chitosan; however, this aldehyde has a certain degree of toxicity. In this framework, trans-2-hexenal, a natural volatile responsible for the green odor of plants, can be a green alternative to obtain chitosan hydrogels.

The aim of this research has been to investigate the formation of chemically cross-linked hydrogels by covalent linking of chitosan chains using trans-2-hexenal as a heterobifunctional crosslinking agent. As far as known, this aldehyde has not yet been used for that purpose. Carbonyl groups of trans-2-hexenal react with primary amines of chitosan giving rise to condensation products as imines or Schiff bases. In addition, being an α,β -unsaturated aldehyde, trans-2-hexenal can undergo 1,4-nucleophilic addition of primary amine groups of chitosan acting as a bridge between chitosan chains (Figure 1).

Different amounts of trans-2-hexenal were incorporated in 4 % (w/v) chitosan acetate solutions (4:0.125, 4:0.25, 4:0.5, 4:0.75 and 4:1 CS:CHO weight ratio), observing the rapid in situ gelation of chitosan. Formation of new bonds in the chitosan matrix was observed by RMN after hydrogel lyophilization. The quantification of aldehyde covalently bonded to chitosan was determined by elemental analysis. Aldehyde incorporation increased from 21% for

chitosan : aldehyde weight ratio of 4:0.125, to 59 % for a weight ratio of 4:1. The effect of trans-2-hexenal concentration on the gelation properties and mechanical strength of the gel was also studied; low gelation times and stronger hydrogels were obtained increasing aldehyde concentration. Lyophilized hydrogels presented a macro-porous structure as observed by SEM. Sponges were stable in pH 3 and retained a great amount of water (1600 % (g of water/ g dry polymer for 4:0.125 CS:CHO weight ratio). The obtained sponges are suitable for different applications such as tissue engineering scaffolds, sustained release systems and absorbent pads.

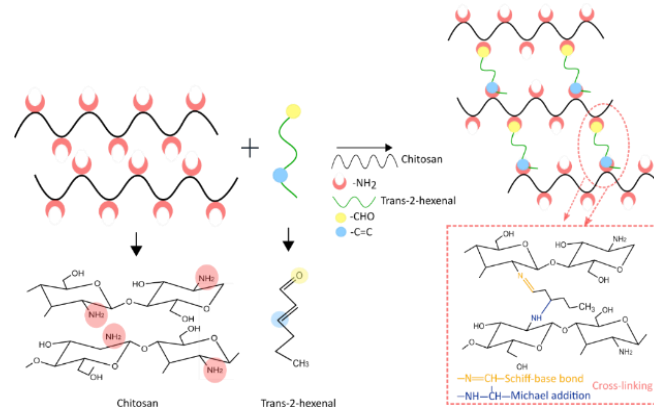


Figure: Chemical crosslinking of chitosan chains with trans-2-hexenal.

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Patricia Esteve-Redondo graduated with a degree in Food Science and Technology in 2017 and earned a Master of Science degree in Food Science and Engineering in 2018 from the Polytechnic University of Valencia. She is currently pursuing her PhD as a member of the research group led by Pilar Hernandez and Rafael Gavara in the AIMaT group at the Institute of Agrochemistry and Food Technology. Her current research is part of the project “Sustainable antimicrobial packaging based on stimuli-responsive biopolymers for postharvest products”, funded by the Spanish Ministry of Economy and Competitiveness.

3rd Poster Prize

CHITOTRIAZOLAN DERIVATIVES FOR ANTIBACTERIAL ACTIVITY

Sankar Rathinam*^a, Martha Á. Hjálmarsdóttir^b, Mikkel B. Thygesen^c, Már Mátsson^a

^a Faculty of Pharmaceutical Sciences, University of Iceland, Reykjavík, Iceland

^b Department of Biomedical Science, University of Iceland Reykjavík, Iceland

^c Department of Chemistry, University of Copenhagen, Denmark

E-mail: sankar@hi.is



Ceremony of poster award. *Left:* Gudlaugur Thór Thórdarson (Minister of the Environment, Energy and Climate, Iceland); *Right:* Sankar Rathinam (Third poster award).

In recent years, the "Click chemistry" reaction has garnered substantial interest because of its remarkable efficiency, specificity, and high yield. Among the most widely utilized click reactions is the copper-catalyzed azide-alkyne cycloaddition (CuAAC). This particular reaction involves the interaction of an azide and an alkyne in the presence of a copper catalyst, proving to be extremely versatile with applications spanning drug discovery, materials science, and bioconjugation. Chitosan, a naturally abundant biopolymer, is known for its remarkable biomedical properties, including biocompatibility, biodegradability, and non-toxicity. There are few studies have investigated the modification of chitosan via click chemistry to produce triazoles, enhancing its utility and functional properties.

In this study, the synthesis of a new class of chitosan derivatives, termed chitotriazolans, is described. This involves the transformation of all C-2 primary amino groups into aromatic chito-1,2,3-triazoles. Additionally, common chitosan derivatives such as trimethyl chitosan (TMC), N-(2-hydroxypropyl)-3-trimethylammonium chitosan chloride (TAC), hydroxyethyl chitosan (HTC), hydroxypropyl chitosan (HPC), and carboxymethyl chitosan (CMC) were partially substituted, allowing the remaining primary amino groups to be converted into triazoles via the CuAAC reaction. To characterize these derivatives, infrared (IR) and nuclear

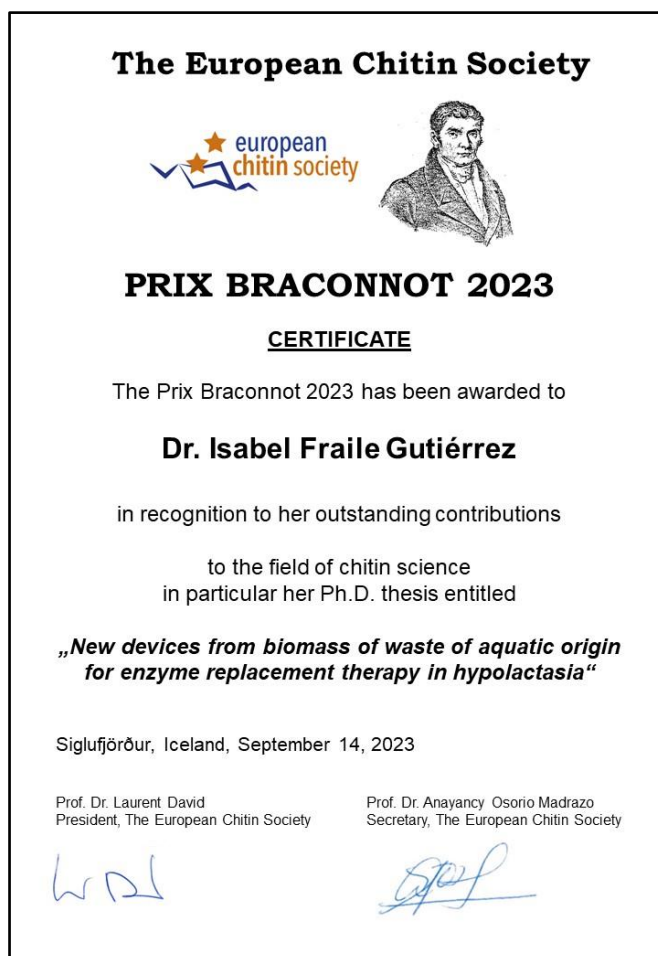
magnetic resonance (NMR) spectroscopy were employed, while size exclusion chromatography was used to determine their molecular weight.

Two approaches were employed to synthesize the chitotriazolan products: one involving the protection of hydroxy groups with tert-butyldimethylsilyl (TBDMS) and one without such protection. Previous studies indicated that chitosan could not be converted more than 40% from amine to triazole using N-azidated chitosan. However, this study successfully synthesized water-soluble chitotriazolan derivatives and chitotriazolans with partially substituted common derivatives, achieving a degree of azidation to 1,2,3-triazole of over 90%, as confirmed by ¹H-NMR.

Sankar Rathinam earned his MSc. in Chemistry from Madurai Vivekananda College in Tamil Nadu, India. He started his research career as a Junior Research Fellow under Prof. Harinath Chakrapani at IISER Pune, India. He also gained industrial experience in medicinal chemistry at Sai Life Sciences Pvt. Ltd in Pune, India. In 2017, he moved to Iceland to pursue his PhD and successfully received his doctoral degree in 2022 from the Faculty of Pharmaceutical Sciences at the University of Iceland, under the supervision of Prof. Már Másson. After completing his PhD, he continued his research as a post-doctoral fellow at the Már research group. He was honored with the Third-best poster award at EUCHIS' 2023 in Iceland where he presented his PhD research work.

Prix Braconnot

The renowned Prix Braconnot 2023 of the EUCHIS society for an excellent PhD thesis was awarded to Isabel Fraile Gutiérrez from the Complutense University of Madrid, Spain.



It was handed to Ms. Fraile Gutiérrez at the closing ceremony of EUCHIS' 2023 in Iceland, by the new President of EUCHIS Prof. Laurent David.



Ceremony of Prix Braconnot 2023 awarded to Isabel Fraile Gutiérrez, presented by Laurent David (President of EUCHIS). Background: fishing town of Siglufjörður, Iceland (conference place).

Here below is the summary of the awarded PhD thesis.

Summary of PhD thesis (Prix Braconnot)

“New devices from biomass of waste of aquatic origin for enzyme replacement therapy in hypolactasia”

by Dr. Isabel Fraile Gutiérrez

Supervisors: Dr. Florentina Niuris Acosta Contreras and Dr. Julia Revuelta Crespo

Lactose intolerance is known to be a common condition caused by a decreased ability to digest lactose, a sugar found in dairy products, with a global prevalence estimated at 70% [1]. The most common option for treating this digestive problem is to eliminate lactose from the diet. However, as dairy products are an essential food group, eliminating them could lead to insufficient intake of calcium and vitamin D, for example, which in turn can lead to osteoporosis, osteomalacia, and hypertension [2]. An interesting alternative to this is enzyme supplementation with lactase from non-human sources. However, oral administration of exogenous lactase still has significant limitations, such as its inactivation during gastrointestinal passage due to low pH and the presence of pepsin, resulting in a short-lived effect, and dosage, which is highly dependent on consumption and also varies from patient to patient [1,3]. In this context, the development of chitosan-based systems has shown that they can increase the activity and stability of these enzymes [4]. However, there are very few examples of the use of CS to produce β -Gal containing formulations for therapeutic use in lactose intolerance.

Based on the above, this doctoral thesis has the goal of developing a CS -poly(ethylene glycol) hydrogel [5] as a carrier for β -Gal with potential application in enzyme supplementation therapy for lactose intolerance. This innovative carrier was prepared by an *in situ* copper-free azide-alkyne click reaction between azide-functionalized chitosan and previously functionalized three-armed poly(ethylene glycol) containing ester-alkyne groups. The use of a three-armed PEG provided an effective route for covalent bio-conjugation of the crosslinker with an azide-functionalized β -galactosidase prior to hydrogel preparation (**Fig. 1**).

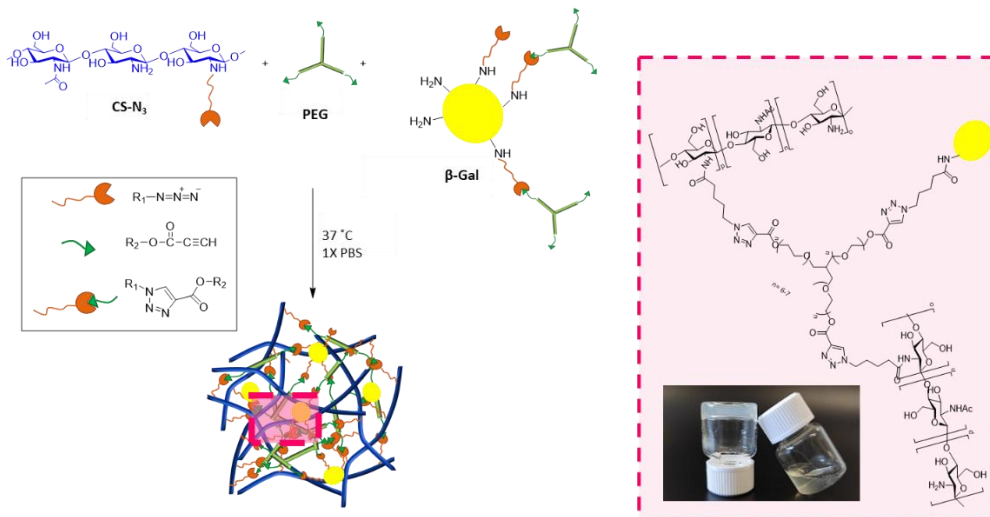


Figure: Schematic representation of crosslinking between chitosan, PEG and β -galactosidase.

Stability and efficiency studies of the new hydrogels have demonstrated high *in vitro* stability of the enzyme under simulated gastric fluid (SGF) and simulated intestinal fluid (SIF). Thus, by encapsulation in the CS-PEG hybrid hydrogels, β -galactosidase is protected from degradation in the stomach and shows activity under intestinal conditions after simulated gastric passage (>70% remaining enzyme activity).

In addition, post-functionalization of the hydrogel surfaces with thiols (**Fig. 2**) has been shown to improve the mucoadhesive properties of the hydrogels by 20% and increase the residence time of the hydrogels in the small intestine, which could avoid the frequent administrations required by conventional commercial preparations.

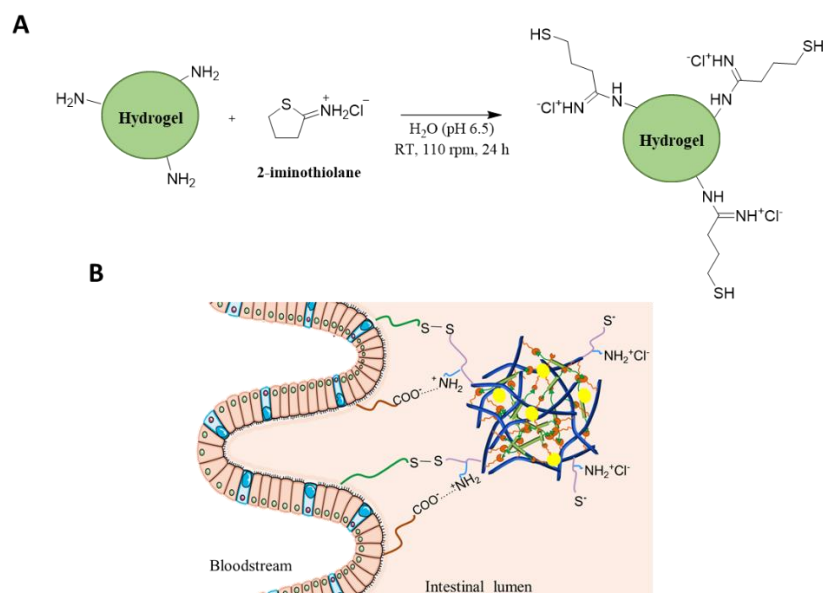


Figure: A: Surface modification of the hydrogel with a thiolating agent; **B:** Binding of the thiol-modified hydrogel to the intestine.

Finally, we investigated a potential enteric coating of hydrogels with the pH-sensitive polymer Eudragit® to develop a β -galactosidase-containing formulation that can be taken without food and remains stable in gastric fluid when the stomach is empty.

Therefore, this work should be of interest to a wide audience and should have application not only in lactose intolerance but also in treating diseases caused by enzyme deficiency.

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Bibliography of Prix Braconnot Winner

Dr Isabel Fraile Gutiérrez

Birth: 23/01/1996 in Torrico, Toledo, Spain

Contact details:

Complutense University of Madrid

P.º de Juan XXIII 1, 28040 Madrid, Spain

At present: University of Bayreuth,

Chair of Organ Printing , 95445 Bayreuth, Germany

Email: Isabel.Fraile-Gutierrez@uni-bayreuth.de



Education:

- **Since 2024** Postdoc, Chair of Organ Printing, University of Bayreuth, Germany
Mentors: Prof. Dr. Anayancy Osorio Madrazo & Prof. Dr. Inmaculada Aranaz Corral
- **2020-2023** PhD in Pharmacy, Complutense University of Madrid
Thesis title: New devices from biomass of waste of aquatic origin for enzyme replacement therapy in hypolactasia.
Supervisors: Prof. Dr. Florentina Niuris Acosta Contreras & Dr. Julia Revuelta Crespo.
- **2018-2020** Master in Industrial and Environmental Biotechnology, Complutense University of Madrid
Master's thesis title: Dressings and bandages based on chitosan and other biopolymers with hemostatic and antimicrobial properties.
Supervisors: Prof. Dr. Inmaculada Aranaz Corral & Prof. Dr. Florentina Niuris Acosta Contreras.

External Internship title: Purification of chitosan and obtaining chitoligosaccharides.

Supervisor: Prof. Dr. Florentina Niuris Acosta Contreras.

- **2014-2018** Bachelor's degree in Biochemistry, Complutense University of Madrid
Title of final bachelor's degree project: Comparative proteomic study of the secretome of two strains of *Staphylococcus aureus* (MSSA and MRSA).

Publications:

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Main communications:

- **Fraile-Gutiérrez, I.** Chitosan-based Oral Hydrogel for Enzyme Replacement Therapy in Hypolactasia. 14th International Conference of the European Chitin Society (EUCHIS` 2023) and the 15th International Conference on Chitin and Chitosan (15th ICC), Siglufjörður, Iceland, September 11th – 14th, 2023. Oral presentation.
- **Fraile-Gutiérrez, I.** New devices from marine biomass for enzyme replacement therapy in hypolactasia. Instituto Pluridisciplinar, Madrid, España, October 26th, 2022. Oral presentation.
- **Fraile-Gutiérrez, I.** New devices from marine biomass for enzyme replacement therapy in hypolactasia. Jornadas Científicas del Instituto de Química Orgánica General-CSIC, Madrid, España, May 2022. Oral presentation.

Travel Awards EUCHIS' 2023

Georgios Margoutidis

Istituto Italiano di Tecnologia (IIT)
16163 Genova
Italy



Georgios Margoutidis (Travel Award EUCHIS' 2023)

Georgios Margoutidis has completed his green chemistry education with an MSc from the University of York, UK (2011) and a PhD from Memorial University of Newfoundland, Canada (2019). He has worked as a predoc researcher in the Catalan Institute for Water Research (ICRA), Spain in 2011, the Centre for Sustainable Chemical Technologies (CSCT), UK in 2016, and as a trainee in the European Chemicals Agency (ECHA), Finland in 2012. He is currently a postdoctoral researcher in Istituto Italiano di Tecnologia (IIT), Italy.

The presentation “Fibers of α -chitin dissolved in freezing $\text{NaOH}_{(\text{aq})}$ ” described a rapid freeze/thaw method of $\text{NaOH}_{(\text{aq})}$ which produces predictable dissolution results for high crystallinity/Mw α -chitin fibers without exceeding a 50 °C difference from room temperature. The polysaccharide’s intermolecular hydrogen bonding network is characterized by powder XRD and FT-IR while kinematic viscosity measurements reveal the polymers’ stretched exponential solution dynamics for solubilities greater than 97%. The method opens the way for homogeneous chitin deacetylation as well as convenient production of promising films with high degree of deacetylation (DA).

After completing my PhD in “Mechanochemical transformations of α -chitin”, I realized that there is a lack of interest in chitin literature regarding the temperature effect on alkali-based solvents. Having published “Dissolution studies of α -chitin fibers in freezing $\text{NaOH}_{(\text{aq})}$ ” on *Cellulose*, it was only natural for me to contribute my knowledge on polysaccharide solubility to a more specific audience like that of the European Chitin Society. Luckily, the outgoing Secretary and currently Honorary President of EUCHIS Prof. Dr. Martin Peter explained to me the application process for the Travel Award, and it was easy for me to get motivated since advances on homogeneous chitin deacetylation might benefit from a rapid dissolution in $\text{NaOH}_{(\text{aq})}$.

Having recently started my postdoc project, which is unrelated to chitin, I did not know what to expect from the conference. Despite my ignorance, even from the program’s kick-off, I was surprised to see all the people taking part in the conference, especially the ones that were closely involved in organizing it, unravelling a remarkable team spirit, working persistently and patiently towards bringing together the chemical and biological areas of chitin/chitosan

research. I consider myself privileged to have had the chance to keep up with the latest advances in chitosan characterization and have a feeling of the analytical methods to determine the dispersity of the fraction of acetylation. Muchmore, I was amazed by the enthusiasm and cooperative energy of the young research team which investigates the relationships between the different chitosan production approaches and their patterns of acetylation. These efforts along with the technological developments of chitosan-based nanocomposites as well as scalable solvents like ionic liquids and high-temperature water can surely transform the dream of market applications into a lasting reality for the circular economy.

During the conference, I had the chance to discuss further advances in my research at the laboratory scale as well as opportunities at the industrial level. I was happy to see that mutual interest has started developing, so I look forward to further talks within the chitin community. Moreover, with memories of the resonance between the presidents of EUCHIS and EPNOE, regarding the challenges of publication of chemical characterization results, as well as Professor Már Mátsson's curiosity on nature's reason for the extra biosynthesis step to go from cellulose to chitin, I believe we all have excellent inspiration to be more purposeful. Maybe Italian governance could promote some actions to valorize the blue crab invasion in Italian waters (<https://www.politico.eu/article/italy-blue-crab-invasion-eat-them/>) which could stimulate future research on cellulose/chitin based sustainable biomaterials (e.g. 3D scaffolds for ex vivo tissue culture). With several ideas in mind, I look forward to collaborating on proposals for projects which will utilize the knowledge of scientists on both the biological and chemical areas of chitin/chitosan research.

EUCHIS Board Meeting

12th September 2023, Siglufjörður, Iceland

MINUTES

Present: Bruno Moerschbacher (Chair, BM), Inmaculada Aranaz (IA), Már Másson (MM), Katja Richter (KR), Laurent David (LD), Francisco Goycoolea (FG)

Apologies: Martin Peter (Secretary, MP)

Minutes: Francisco Goycoolea (FG)

The meeting agenda had been submitted to all members of the Board in time for approval, and there were no objections or amendments.

Agenda

1. Opening
2. Keeping of minutes
3. Report of the President
4. Report of the Secretary
5. Report of the Treasurer, 2022
6. Membership figures 2023
7. General Assembly
8. Nomination of new Board members
9. Next EUCHIS conference
10. Any other business

23/1.-3. Report of the President

BM opened and thanked the attending Board members. He commented on the regrettable absence of Martin Peter, who despite his best efforts, could not attend the conference. In absence of MP, BM invited a volunteer to keep the meeting notes and draft the minutes, to which FG agreed. Activity in the Society during the pandemics period and subsequent paucity in conferences was substantially disrupted. To mitigate for this, online seminars were launched during 2021 and were coordinated by Gregor Tegl. EUCHIS student bursaries were also introduced and are now published in the website. Several Board meetings and one General Assembly were organized online. One outcome of these meetings was that the current Board and Committee remained on duty until the next EUCHIS meeting (i.e., this one) during which new Board and new Committee members would be elected. BM has made major efforts to discuss with SIAQ and representatives of Asian countries (Japan and India), to coordinate efforts to consolidate the formation of the International Federation of Chitin and Chitosan Societies (IFCCS), as agreed upon in Osaka in 2018 during the APCCS/ICCC there. Now, the Guidelines for IFCCS need to be defined and agreed upon. Among its mission to be declared in the Guidelines, the IFCCS must lay out rules for the characteristics of chitin, chitosan and derivatives to be

communicated to editors of scientific journals, and it must harmonize the organization of international conferences; the legal status must be declared and in addition, rules for membership, the Presidency or Chair and number of members to be part of the IFCCS board, as well the mechanisms for decisions making need to be defined. Action: if IFCCS team agrees during the meeting on Thursday, BM to draft Guidelines of IFCCS and circulate among potential members.

23/4. Report of the Secretary

Prepared by MP to be read at the General Assembly.

Three Newsletters (# 48 – 50) appeared on a regular schedule during 2021 - 2023. They were uploaded to the website of EUCHIS and distributed to all members by e-mail. Members are invited to contribute more actively to the Newsletter, especially with a focus on completed PhD theses and ongoing non-confidential research items.

Other tasks of the Secretary were maintaining the membership database, assisting the President in correspondence and preparation of documents for decisions, including planning of conferences, performing correspondence with members, including sending out notes for annual subscriptions and receipts for payments, and compiling annual records of members bibliography.

The cooperation with EPNOE proceeded smoothly and successfully. EPNOE is represented in this conference by the President, Professor Pedro Fardim.

23/5. Report of the Treasurer 2022

KR presented the financial report. The Society bank account was transferred from Deutsche Bank to Sparkasse. A total positive balance of 10.000 Euro. The Society contributed with 5.000 Euro to the organization of EUCHIS` 2023 conference. A total income of 2.000 Euro from renewal of memberships is expected, hence the estimated final balance for 2023 is 8.000 Euro. MM commented that the conference finances seemed healthy and may be able to return the 5.000 Euro to the Society. KR informed about the increasing red tape and hurdles associated with maintaining the bank account in Germany, as according with French law, only societies with more than 200 members, can be considered non-profit organizations. In Germany, the situation is not fully clear, and even when bank account (in Sparkasse?) can still be maintained, this has become increasingly challenging due to the need of an official statement of the Society's status as a non-profit organization in France. An informal legal consultation regarding this issue in France would be in order. In case that the situation turns out more complicated in France, KR proposed to consider the possibility to move the legal registration of the Society to a different country, where it can be register as a non-profit organization regardless of the number of members. IA informed about the impossibility to recover the surplus balance

from the organization of EUCHIS` 2017 conference in Seville from the conference organizing company that went in insolvency after the pandemics. KR asked for a member of the board to handle the process of discharging her during the General Assembly, in the absence of the Assistant Treasurer (Francisca Escribano). IA agreed to request the General Assembly to discharge the Treasurer. KR suggested that we should consider increasing the membership fees that have never been adjusted since the creation of EUCHIS. She emphasized the importance of the advantages that the membership must offer. The general opinion was that the membership fees should be revised. Action: LD to consult with a legal entity in France about the situation. All: come up with ideas for membership benefits

23/6. Membership Figures 2023

The first membership figures of 2023 were presented in the last Newsletter (# 50).

Presently, EUCHIS has 71 members, which means an increase of nine since January 2022, due to 16 successful new applications, while seven members cancelled or lost the membership.

Membership development

2022-01-27 til 2023-05-31

	collective	donor	associate	active	student	total
26.01.2022	5	7	5	37	8	62
terminated	-1	0	-1	-3	-1	-7
new	0	2	6	6	1	16
balance*	-1	2	5	3	0	9
31.05.2023	4	9	10	40	8	71
* Includes 1 change from active to donor						

	collective	donor	associate	active	student	total
Belgium	1	1				2
Canada			1			1
France	2	2		2		6
Germany		2		12		14
Greece				1		1
Hungary	1					1
Iceland				2		2
India			3			3
Ireland			1	1		2
Italy				5	1	6
Japan					1	1
Netherlands					1	1
Norway				3		3
Poland				3		3
Portugal					1	1
Romania				1		1
Russia		1		4	1	6
Spain				3	2	5
Sweden				1		1
Thailand			1			1
Turkey		1				1
U.K.		1	1	2	1	5
U.S.A.		1	2			3
U.A.E.			1			1

EUCHIS General Assembly

13th September 2023, Siglufjörður, Iceland

23/7.-8. General Assembly and Nomination of New Board Members

The nomination of new Board members happened online, the list is now closed. Also, election by EUCHIS members occurred online, a second ballot will be required during the General Assembly concerning the decision between two nominees who have received equal votes. New functions in the Committee of the Board will need to be decided by the new Board after the General Assembly (President, two Vice-Presidents, Secretary, Assistant Secretary, Treasurer, and Assistant Treasurer). BM will ask the General Assembly to confirm the current practice to grant Donor member status to members who donate the equivalent to ten annual membership fees. BM will also propose the General Assembly to honor the many contributions of Prof. Martin Peter to EUCHIS by electing him Honorary President, as approved in a previous online meeting of the Board.

Elected New Board:

Laurent David (LD), President Université Lyon 1 Ingénierie des Matériaux Polymères IMP 15, bd Latarjet, 69622 Villeurbanne Cedex FRANCE laurent.david@univ-lyon1.fr	Martin Peter (MP), Honorary President Professor Emeritus University of Potsdam Natural Products Chemistry GERMANY martin.peter@uni-potsdam.de	
Inmaculada Aranaz (IA), Vice-President Complutense University Biofunctional Research Studies Institute Paseo de Juan XXIII, 1, 28040 Madrid SPAIN iaranaz@ucm.es	Már Másson (MM), Vice-President School of Health Sciences University of Iceland Hagi, Hofsvallagata 53, 107 Reykjavík ICELAND mmasson@hi.is	
Anayancy Osorio-Madrado (AO), Secretary University of Bayreuth Chair of Additive Process (Organ Printing) Universitätsstr. 30, 95447 Bayreuth GERMANY anayancy.osorio-madrado@uni-bayreuth.de	Hans Merzendorfer (HM), Assistant Secretary Universität Siegen, Institut für Biologie Adolf-Reichwein-Str. 2, 57068 Siegen GERMANY merzendorfer@chemie-bio.uni-siegen.de	
Richter, Katja (KR), Treasurer Heppe Medical Chitosan Heirich-Damerow-Str. 1, 06120 Halle GERMANY k.richter@medical-chitosan.com	Bruno Moerschbacher (BM), Assistant Treasurer University Münster, IBBP Schloßplatz 8, 48149 Münster GERMANY moersch@uni-muenster.de	
Francisco Goycoolea (FG) University of Murcia Department of Cell Biology and Histology 30100 Murcia SPAIN fm.goycoolea@gmail.com	Luminita Marin (LM) Petru Poni Institute of Macromolecular Chemistry 41A Grigore Ghica Voda Alley, 708487 Iasi ROMANIA lmarin@icmpp.ro	Struszczyk, Marcin (MS) Institute of Security Technologies 3, M. Skłodowskiej-Curie Str. 90-505 Lodz POLAND mstruszczyk@moratex.eu
Svetlana Bratskaya (SB) Institut of Chemistry FEBRAS Laboratory of Sorbtion Processes 159, ave 100-letiya Vladivostoka 690022 Vladivostok RUSSIA s.bratskaya@gmail.com	Carla Caramella (CC) University of Pavia Dept. of Drug Science Viale Taramelli 12 27100 Pavia ITALY carla.caramella@unipv.it	Luca Casettari (LC) University of Urbino Carlo Bo 6, Piazza del Rinascimento 61029 Urbino ITALY luca.casettari@uniurb.it
Véronique Coma (VC) LCPO, UMR CNRS 5629 – IPB/ENSCBP Biopolymers & Bio-based Materials 16 Avenue Pey Berland, 33607 PESSAC Cedex FRANCE veronique.coma@u-bordeaux.fr	Oscar Goni (OG) Institute of Technology Tralee, N/A V92CX88 IRELAND oscar.goni@staff.ittralee.ie	Gustav Vaaje-Kolstad (GV) Norwegian Univ. of Life Sciences Fac. Chemistry, Biotechnology & Food Science, 1432 AAS NORWAY gustav.vaaje-kolstad@nmbu.no

23/9. Next EUCHIS Conference

To be discussed at the new Board meeting after the General Assembly.

23/10. Any Other Business

Agreement to consider organizing a new Summer School. Other possibilities such as as applying for a COST action and to intensify partnerships with EPNOE and other pertinent Societies were also voiced.

Nominations for the Braconnot prize were coming in very late, but as there has not been a EUCHIS conference and, as a consequence, the Braconnot prize has not been awarded since 2017, BM and MP had agreed to accept the two late nominations and to involve all Board members (with the exception of IA and FG who were involved in the defense of one of the nominees), to act as referees and to send their electronic votes to MP who conveyed them to BM. However, this did not yield a clear result, final discussions are needed and the awardee will be announced during the closing ceremony by the new President.

Ref	Actions	By Whom	Timescale
23/01	BM to draft guidelines of IFCCS and circulate among potential members.	BM	ASAP
23/03	LD to consult with a legal entity in France about the situation.	LD	ASAP

EUCHIS New Board Meeting No.1

13th September 2023, Siglufjörður, Iceland

MINUTES

Present: Bruno Moerschbacher (Chair, BM), Inmaculada Aranaz (IA), Már Másson (MM), Katja Richter (KR), Laurent David (LD), Francisco Goycoolea (FG), Anayancy Osorio Madrazo (AO), Hans Merzendorfer (HM)

Agenda

1. Keeping of minutes
2. Obligatory process with the Prefecture in Lyon
3. Composition of the Committee of the Board
4. Any other business

23/ 01 Keeping of minutes
FG volunteered to take notes and draft the minutes.

23/ 02 Obligatory process with the Prefecture in Lyon
Protocol of General Assembly, details of new Board members, election of the Committee of the Board, and minutes of the meeting to be registered at the Prefecture in Lyon within three months. Fill in information for new board, including information for the Society's bank account.

Actions:

KR to contact members by email.

LD: Legal procedure at French Societies office.

23/ 03 Composition of the Committee of the Board

BM jointly by consultation with MP, proposed LD to become the new President, to which the Board agreed. LD accepted to assume the President of EUCHIS, initially for the next period of two or three years, i.e. until the next General Assembly meeting during the next EUCHIS conference. LD suggested Anayancy Osorio Madrazo (AO) to become the Secretary, the Board agreed, and she accepted. KR was re-elected as Treasurer. The other roles agreed by the Board were: MM Vice-President, IA (re-elected) Vice-President, HM Assistant Secretary, BM Assistant Treasurer.

23/ 04 Any other business

Decision of where to organize next EUCHIS: FG proposed to host the next EUCHIS in Murcia, Spain, either in 2025 or in 2026. The possibility of a shift to 2025, contrary to the schedule agreed upon by the IFCCS team, will need to be discussed during tomorrow's IFCCS meeting. This conference can be organized with the support and under the auspices of the University of Murcia, where FG will be taking a new position as of 1st December 2023. If the meeting is held in 2025, subject to decisions from IFCCS and SIAQ to co-organize the meeting together with EUCHIS, FG mentioned the possibility to bid also for the "Gums and Stabilisers for the Food Industry" conference that can take place in tandem, e.g. with an overlapping day of shared sessions. G&S conference is to be held in 2025, and the Food Hydrocolloids Trust is currently in the process of accepting bids to host it. The advantages of having these meetings in tandem can be manifold, given the overlap around chitin and chitosan in the two meetings.

EUCHIS New Board Meeting No.2

May 24th, 2024 (online meeting)

Agenda:

1. Preparation of the EUCHIS Meeting in 2026
2. Proposal of a Summer School in June/July 2025
3. Finalization of the EUCHIS Newsletter
4. Other issues.

Present: L. David (President), K. Richter (Treasurer), F. Goycoolea, V. Coma, L. Marin, M. Peter (Honorary President), S. Bratskava, M. Masson (Vize-President), M. Struszczyk, C. Caramella, G Vaaje-Kolstad, I. Aranaz (Vize-President), B. Moerschbacher. All participants may be designated with their initials below.

Excused: Anayancy Osorio Madrazo (Secretary), Hans-Michael Merzendorfer

1. Francisco Goycoolea presents a proposal for the organization of the next EUCHIS Meeting in 2026 in Murcia (Spain). The university of Murcia has a 'Social Center' with amphitheater able to contain 332 people, an Agora place (meals), an exhibition Hall and several rooms for poster sessions.

*The final proposed dates are: from May 10th to 13th, 2026, for about 180 delegates.

*Murcia is easy to reach, from Madrid or from Alicante.

*LD would like that the fees of the EUCHIS Meeting should be well chosen, in particular there should be a significant difference from members from non-members (VC: how much would be this difference? IA: more than 100€, possible more than 200€), LD: and the link for EUCHIS member registration should be accessible directly from the EUCHIS Meeting registration website.

*MM insists on having a good support from a specialized company able to develop the website of the meeting, the collection and edition of the Abstract, and a good audio/video system for the conferences themselves. He has leftovers from the last EUCHIS meeting in Iceland, which he would like to transfer to EUCHIS for the organization of the Murcia congress. (after discussion, I. Aranaz advised to pay the taxes needed to the money transfer). Such funds would be useful for the organization, since there are many expenses to perform in advance.

*BM asks for the interest of a hybrid organization with possibility to organize a videoconference retransmission offering to listen online.

A discussion started about this point with a majority of negative opinion (MM, FG, LD, KR, IA, CC, VC) based on the following arguments:

- This necessitates further investment and organization efforts, for limited benefit
- The strength of the meetings is to contact people face to face, Visio conference do not offer this contact
- Another interest of the meeting is the social program, unavailable to distant audience

*FG suggest we could organize a Young Researcher session (either at the end or at the beginning)

The Board unanimously entrusted Francisco Goycoolea with the responsibility of organizing the next EUCHIS Congress in Murcia from May 10th to 13th, 2026.

2. Summer School on Chitin/Chitosan Science

Laurent DAVID proposes to organize a Summer School in Lyon in June or July 2025.

Such event would be an intermediate activity, before the Murcia event. There is a strong demand on academic and industrial levels for information and formation on chitosanS.

This year, the targeted audience would be Post Docs and PhDs. In the next Summer schools, we could address to industrials (adjusting the fees).

The program should cover extraction, preparation of different chitosans, characterization, materials and processing, applications (biomedical, water treatment, agriculture etc..)

The largest difficulties to overcome is to find accommodation for the PhD/Post-Docs. The board is invited to participate in this Summer School to give lectures, either face-to-face or distance learning. Laurent DAVID will provide a more detailed lecture program.

The UCBL University may help for the organization of the Summer School (5 k€), and funds can also be obtained from Region Rhone Alpes (in particular funds to help foreign students to come to Lyon)

*FG expresses an interest in practicums. LD replies that practicals should be included, SEC (molar mass distributions), NMR (mean DA), X-rays could be implemented with small turning groups. The attendees could bring samples with them.

*IA reports on her experience in ULM 20 years ago. There were 60 persons, in a hotel. The organization of the School was possible with some grants, and the social program was important.

*MM: Thinks it is a good idea, in particular it would provide an intermediate activity before the Murcia meeting. The chemical modification of chitosans and regulatory issues should be included in the formation. This was agreed.

*BM: we should organize this Summer School on a regular basis, but it should be organized in different places with rotation across the different countries represented in EUCHIS. This was agreed.

*KR: was interested in the regulatory issues for chitosans applications in medical devices.

*CC: July could be a better time to organize the Summer School, since the rooms of students are easier to obtain at this period. LD will check this with CROUSS in LYON.

3. EUCHIS Newsletter

We are a very late for the publication of the newsletter. Mar MASSON and Katja Richter are kindly but firmly asked to reply to Anayancy Osorio to complete it (ex: report of last EPNOE and APCCS meetings, list of members).

*LD reminds that the publication of the meeting is mandatory for EUCHIS.

*FG: The Newsletter should inform of the dates of the next EUCHIS meeting, maybe also the next SIAQ and APCCS in 2025.

4. Other issues

*MP asks if a new web responsible was found. LD replies that indeed, a new administrator is found: philipp.lemke@uni-muenster.de.

*KR: please send me info if you have news to publish on the Linked-In website of EUCHIS as well.

*LD: FG will organize meetings to further organize the Murcia event, LD will organize technical meetings to organize the Summer School.

Membership Development 2023

As displayed below, in the whole year 2023, the EUCHIS society had 77 members, which means an increase of 8 since the last analysis end of May 2023. They are 12 Students, 42 Active, 9 Associate, and 2 Collective members. Besides, the EUCHIS society had a donation record of +10 donors in 2023. We work in improving the scope of EUCHIS for young students and early-career researchers interested in the field of chitin and chitosan research. We encourage postgraduate and undergraduate students to become members of this community and network, where Schools, Workshops, Travel grants and several scientific Awards are specially addressed to students.

Table: Membership development, 01-12/2023.

Donor	9
Donor associate	1
Active	34
Active east	8
Associate	9
Collective	4
Students	12

Table: Membership development per country, 01-12/2023.

Country	Donor	Collective	Active	Active east	Student	Associate	Members in 2023
Austria			1				1
Belgium	1	1					2
Canada						1	1
Dubai						1	1
France	2	2	2		1		7
Germany	4		11		1		16
Hungary		1					1
Iceland			2				2
India					1	3	4

Ireland				1		1	2
Israel			1				1
Italy			7		1		8
Japan					1		1
Netherlands					1		1
Norway			2				2
Poland				2	1		3
Portugal					1		1
Romania				1			1
Russia	1			4	1		6
Spain			4		2		6
Sweden			1				1
Thailand						1	1
Turkey	1						1
UK			3		1		4
USA	1					2	3
SUM	10	4	34	8	12	9	77

Kick-off Meeting DFG SPP "Code CHI", Germany 2024

Code χ : A Priority Programme for innovative Chito-based research funded by the German Research Foundation

In 2023, the German Research Foundation (DFG) established a new priority programme (SPP 2416) entitled "Code χ - Chitin, Chitosan, and Chito-Oligosaccharides and their Interaction with Proteins of the Extracellular Matrix and Cellular Signaling Pathways." The main aim of this transregional programme is the development of joint multi-angled approaches to understand the formation of natural chitin/chitosan (C/CS)-based structures, which largely vary in their physicochemical properties, their degradation, and the bioactivities of C/CS-based materials. In nineteen individual, joint, associated and service projects, scientists in the consortium are addressing the structural tenets determining the immense range of physicochemical properties of C/CS structures, but also aspects involving C/CS modification and degradation as well as chitooligosaccharide (COS)-based communication. Their findings are intended to decode the "Code χ " that determines the structure and properties of C/CS-based frameworks and COS-based communication. For example, it is being investigated which exact C/CS patterns are detected by receptors of the human immune system and how this knowledge can be used to grow human tissues such as the cornea in tissue culture for transplantation. Other projects investigate how insects synthesize and orchestrate the assembly of the C/CS-based extracellular matrix in the integument or form C/CS-based intestinal infection barriers exhibiting distinct properties in different gut regions. Projects from the field of plant science, in turn, aim to clarify how plants detect and protect themselves from pathogens based on C/CS/COS pattern recognition or how certain CS particles can be used in plant protection.

A major goal of the priority programme is to bring together scientists from different research areas including disciplines from Life Sciences, Chemistry and Materials Sciences. Fostering the exchange between these disciplines will lead to tangible interdisciplinary cooperation, knowledge transfer between project partners, and to the creation of synergies within the consortium. This is achieved through establishing an international advisory committee for the programme and organizing diverse scientific events, including annual retreats, project-specific workshops, and summer schools. To address both the public and industry, a Code χ Exhibition Day is planned in 2025, which will create contact sites for scientists from the fields of chito-based research with industry representatives.

Ultimately, the knowledge provided by this priority programme will advance the know-how for the development of chito-based materials for wide-ranging applications in Life Science and Technology.

Code χ in Numbers:

- The programme is designed for a total of 6 years, divided into **2** funding periods of **3** years each.
- The first funding period includes:

- **23** Principal Investigators from **19** different universities/research institutions in Germany.
- **8** postdocs and **13** PhD students (as of March 2024).
- **14** funded research projects, **3** central service projects, and **2** associated projects.
- The Kick-Off Meeting of the programme was held in Siegen on February **1st-2nd, 2024**.

This priority programme is a great opportunity to harness the collective expertise and synergy of scientists to propel forward in their shared mission of advancing chitin-related research. The programme committee consists of 5 renowned scientists in the field of chito-based research and the programme is coordinated by Prof. Dr. Hans Merzendorfer from the Institute of Biology at the University of Siegen. For more information about Codechi, please visit the website <https://codechi.de/> or reach out to Dr. Ehab El-Awaad (ehab.elawaad@uni-siegen.de) from the coordination office of the programme.



Announcements for Future IFCCS Conferences

- **2025: 14th APCCS Asia-Pacific Chitin and Chitosan Symposium**

The 14th APCCS Asia-Pacific Chitin and Chitosan Symposium (which is the 2nd meeting of the International Federation of Chitin and Chitosan Societies IFCCS) will be held from August 26th to 29th, 2025 at National Taiwan University, Taipei, Taiwan, organized by Prof. Trong-Ming Don. More details can be followed at the conference website: <https://www.apccs2025.org/>.

- **2025: 9th SIAQ Ibero-American Chitin Society Conference / 2nd IFCCS**

The Iberoamerican Chitin Society is proud to announce that the upcoming 16th International Conference on Chitin and Chitosan ICCS (which is the 3rd meeting of the International Federation of Chitin and Chitosan Societies IFCCS) will be held jointly with the Ibero-American Chitin Symposium 9th SIAQ next year in Mexico, organized by Prof. Waldo Argüelles Monal. The venue will be the city of Hermosillo, Sonora, from 26th to 29th October 2025. The state of Sonora is in Northwestern Mexico, bordering the state of Arizona, USA. More details will be informed soon at the website of the conference: <https://chitin2025.org>.

- **2026: 15th EUCHIS European Chitin Society Conference**

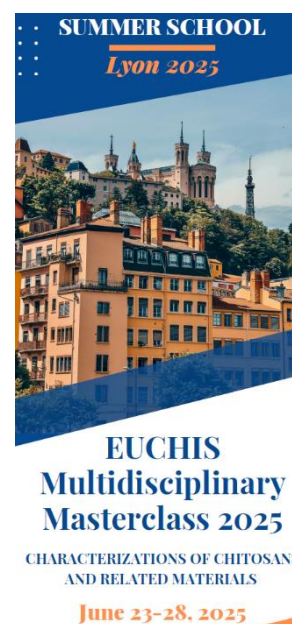
The EUCHIS' 2026 will take place from May 10th till 13th in Murcia, Spain. It will be organized by Prof. Francisco M. Goycoolea and Dr. María del Mar Collado González. More details are coming soon at our EUCHIS website: <https://euchis.org/>.



Next EUCHIS' 2026 to take place in Murcia, Spain announced by Prof. Francisco M. Goycoolea and Dr. María del M. Collado González (left, middle) at the EUCHIS' 2023 Closing ceremony chaired by Prof. Laurent David, President of EUCHIS (right).

Announcement for EUCHIS Summer School 2025

The EUCHIS Summer School 2025 will take place from June 23rd to 28th, 2025 at the Institute of Polymer Material Engineering IMP/ CNRS UMR 5223 at the Claude Bernard University of Lyon 1 in Villeurbanne Cedex, France. The Chairperson of the EUCHIS Summer School 2025 is the President of EUCHIS, Prof. Laurent David. Young researchers (PhDs, Post-Docs) interested in learning or deepening their knowledge on application-oriented fundamental research on chitin and chitosan, especially on different advanced methods used to characterize chitosan macromolecular structure and physico-chemical properties, are welcome to attend. Lectures, Seminars, Laboratory practical sessions will be offered to the participants. More details are coming soon in the web at <https://euchismasterclass.org/>.



Edited by:
Prof Dr. Anayancy Osorio Madrazo