

THE LIFE SCIENCES VOICE

The Georgia Bio Industry E-Newsletter

Newsletter Issue: December 2018

Table of Contents

Letter from the President	2
Georgia Session Kicks Off in January	3
Interview with Robert J. Woods: Computational Modeling and Glycobiology	4
Experts Converge on Atlanta to Discuss Future of Vaccines	6
STEM Professionals in the Classroom	7
Atlanta Science Festival: Save the Date	7
Everything You Wanted to Know About JPM Week 2019	7
Featured New Members	8
Upcoming Events	8
Welcome New Members	8

Georgia Bio Newsletter Credits

Layout & Distribution: Kristen Pappaterra, Georgia Bio

National Life Sciences Partners



AdvaMed
Advanced Medical Technology Association



Letter from the President



As Georgia Bio enters its 30th year, we look back on an innovative year for our industry and its work bringing life science products to the market to better serve patients. Our membership has grown in all sectors over the last 365 days, but most importantly, we have added many new Core members so that we can better represent the breadth of this industry.

Our primary goal for 2018 was to improve the value of your membership. I hope you feel that we have helped your organization, but there is always more to do. Under the direction of Russell Allen, who we thank for his outstanding leadership, we increased participation in our discount purchasing programs and added new benefits to membership, and we plan to continue focus on and expand those benefits in 2019. Georgia Bio convened top bioscience minds at the Georgia Bio Innovation Summit in October where we welcome 500 attendees. Additionally, we hosted and partnered on over 35 events throughout the year, including webinars, industry tours, a newly launched career fair, and BioBash happy hours.

The Georgia BioEd Institute hosted in partnership with UCB our first ever summer teacher training camp where teachers received real-world training in the life sciences which they can now pass down to their students. Lastly, the GaBioEd Equipment Depot impacted nearly 5000 students in 2019 supplying classrooms with the tools needed to teach bioscience. Thank you to our VWR and Fisher partners for their support.

2019 will prove to be an even more exciting year for our association as we move into new areas of the industry, including Digital Health, AgBio and Industrial Biotech. We will be issuing a survey in the first part of January to gauge your interest in several industry specific roundtables, including a MedTech and Digital Health Roundtable; and C-Suite Dinner Roundtable. As we look to our national partners for guidance, Georgia Bio will explore how it can lead the Southeast region in setting organizational policy and recommendations for members around Diversity and Inclusion in life sciences. If you are interested in taking a leadership role in any of these areas, please let me know.

The Georgia Bio staff has undergone changes in recent months to better serve our members. We welcomed Kristina Forbes in November, in the new role of Senior Director of Member Engagement. Kristina brings some innovative ideas to better serve our members which we look forward to executing on in 2019. She will help ensure that you are getting the most from your membership, so please drop her a line sometime to go over all of our features and benefits. In early January, we will welcome another team member who will be leading External Affairs and Business Development. This new role will allow the organization to better develop our chapters around the state, and enhance our work at the state capital in addition to better harnessing our relationships with our DC partners BIO, AdvaMed and PhRMA. Of course, Kristen and I remain available to you and we look forward to working with you in the new year.

As I mentioned earlier, there is always more to do, and we rely on your feedback and advice to continue advancing our organization and this important industry. Please complete the member survey when it goes out in early January.

In closing, I encourage you to join us on **Friday, February 8th for our 30th Anniversary Gala & Helix Awards Ceremony at the Hyatt at Villa Christina**. The event will very different from past years, celebrating our past and forecasting our future as an organization, and one of Georgia's most innovative industry's. Be sure to bring your dancing partner and shoes for the post-dinner live band dance party! [More here.](#)

Have a wonderful holiday season and a Happy New Year!

Sincerely,
Maria Thacker Goethe
Acting President & CEO, Georgia Bio and the Georgia BioEd Institute

Save the Date

Friday, February 8, 2019
5:30 - 10 p.m.
The Hyatt at Villa Christina
Awards | Dinner | Dancing

(Attire: Business Elegant)



Georgia Session Kicks Off in January

By: Sally Kilpatrick, Cornerstone Government Affairs

Georgia's General Assembly will convene the 2019 legislative session on Monday, January 14 and swear in Governor-elect Brian Kemp as Georgia's 83rd Governor. The November elections bring many new faces to the State Capitol with more than 30 newly elected legislators taking office as well as Lieutenant Governor-elect Geoff Duncan assuming his leadership position over the State Senate.

Georgia Bio will remain focused on advancing its legislative agenda by working with the new administration and elected leaders on important issues shaping the life science industry including workforce development, economic development and patient access. [Click Here to View the 2019 Legislative Agenda.](#)

It's critical that member companies of all sizes engage and participate on the Georgia Bio Policy & Advocacy Committee so that our industry has a strong voice with our elected leaders. Please email Maria Thacker at mthacker@gabio.org if you would like to get involved.

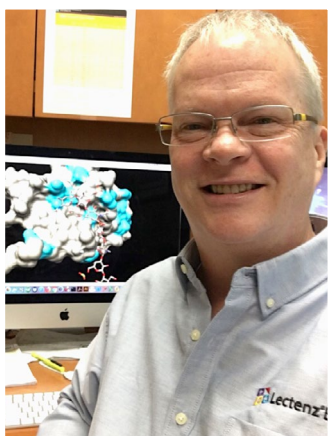


Senator Kay Kirkpatrick & Representative Rick Jasperse joined our legislative panel at the Summit. Also pictured: Joe Zorzoli, UCB; Holly Snow, Amgen; Maria Thacker, GaBio; and Kallarin Mackey, Emory University.

Computational Modeling and Glycobiology: How modeling sugars can advance medicine and streamline success

An interview with Robert J.
Woods, PhD, FRSC

*By Joshua Renfroe, MPH, PhD and
Hannah Bass*



The field of computational biology has grown tremendously in the last three decades, and its contribution to medical applications and drug discovery is just beginning. Rob Woods of University of Georgia's Complex Carbohydrate Research Center has worked in molecular modeling for 30 years and shares his experience and insight in the field, its current progress, and future directions.

What is computational biology and how did the field get to where it is today?

Computational biology is concerned with developing models of biological processes, to allow predictions of molecular conformation and interactions. The field had a rocky start. Some of the first work performed in the 80's garnered much excitement among researchers, but was considered to be overpromised and underdelivered. These early models could not account for the complexity of proteins and biological systems, primarily due to lack of computing power. The problem was (and is) that modeling proteins and their interactions with other proteins or small molecules accurately requires considerable amount of computing power because they are dependent upon shape, movement, and conformation.

Limited computational power has been the major challenge in the field for a long time, but about ten years ago computational processing power increased tremendously thanks to demand in computer gaming performance. We now have Graphical Processing Units (GPUs), which has allowed computational power to characterize larger proteins and more complex interactions.

The last ten years were important. Where do you see this field in the next ten years?

We started off modeling small peptides, then tertiary structures, and then domains. We are now able to model either a small protein for a long time or a large protein for a short time – there's a trade-off. In the near future, we should be able to model larger proteins for longer periods.

But biology is complex and modeling a single protein and its interaction with another protein or molecule may not be enough. These molecular events do not occur in isolation – they occur in a complex cellular environment that may involve transmembrane proteins, varied intercellular environments, and a cascade of signaling events involving other proteins and molecules. As we start to do more with computational modeling, people ask bigger questions. According to Moore's Law – that computational power doubles every 18 months. This has not yet plateaued and as long as it doesn't, we will be able to continue to model increasingly complex systems, such as cell membranes or even entire cells.

That's very exciting because being able to predict and screen these events will certainly reduce time and costs associated with drug development. How easy will these tools be for non-experts to use?

The idea is to develop tools for non-experts to do their work and our group here at the Complex Carbohydrate Research Center is developing tools for just that. However, there is some pushback from the computational biology community. The thought among some is that non-experts may do something silly, generate invalid data, and blame the modeling software – and we will have the same problem we had back in the 80's where people lost confidence in the field. But it is similar to when you buy a reagent – if you don't follow the protocol, you don't get good results. So our work is to develop robust interfaces and SOPs, limit number of user options, keep it simple, and allow non-experts to use these tools. You shouldn't need an expert to interpret your data and individuals studying a specific protein or system are often very familiar with nuances of the system and can come to the right conclusions on their own. We just want to make it easy for them.

How will these tools best help groups in industry?

We've worked with industry groups in the past to address issues in the development of vaccines. Carbohydrates, attached to proteins, are prone to movement and characterizing this behavior will greatly improve predictions involving antibody-antigen interactions. Another way that computational modeling would benefit industry is in development of glycomimetic drugs – drugs that mimic sugars. Many diseases could be treated or prevented by blocking recognition of a sugar on the pathogen by a host receptor protein (or vice versa) or by preventing formation of the sugar by blocking an enzyme that synthesizes the sugar in vivo. A molecule that binds better to the receptor than the sugar itself, may be a good drug candidate. Some work has been done in this area, but not using computational tools. We are currently looking at blocking the recognition of host cell surface sugars by proteins on the influenza virus, and using computational modeling, have improved the affinity of the lead glycomimetics by 20-fold over the native cell surface receptor sugar. Our group is working on software to screen thousands of candidates and modifications quickly to predict a drug candidate most likely to have the desired effect. Others are looking at carbohydrate-based drugs for sickle cell anemia, which blocks a sugar protein interaction. But to help the field, we are developing a tool that can help predict how sugar modifications might turn it into an inhibitor.

Best example using computational modeling that led to a recent drug?

Computational development has been used in predicting the structure and these tools have allowed chemists to predict the shape and design drugs, but the area of computationally screening a library of carbohydrate-protein interaction is still under development. And for sugars, computational predictions are even more complicated. Currently, a transferase inhibitor, PUGNAC, has been modeled based to its structural biology and crystallography. The field of computational modeling is still very much under active development.

Will computational modeling for carbohydrate-based drug discovery be commonplace in the next 10 - 20 years?

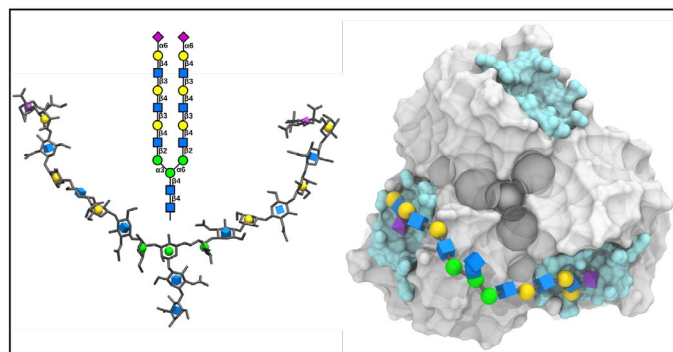
We are hoping to move in that direction. Right now, in order for this field to grow, there is a need for simpler tools that enable computational scientists to overcome their 'fear' of modeling carbohydrates. Compared to proteins and other molecules, the differences between sugars are extremely subtle, which makes modeling them more difficult. Chemical differences between sugars are due to the strengths of the hydrogen bonds and hydrophobic interactions, but these primarily arise from differences among monosaccharide stereochemistries instead of from chemical diversity. This is in stark contrast to amino acids that differ principally in chemical makeup, but not stereochemistry. Sadly, carbohydrates are often out of the comfort zone of many scientists, and we hope that by simplifying the myriad complexities, the skills of a diverse range of scientists can be brought to bear on the development of new glycomimetic drugs.

How does this information relate to the work of your company Lectenz Bio?

So far, I have been discussing the ability to use computational biology to modify sugars to do what you want them to do. However, on the flip side, computational biology can also be utilized to modify enzyme or receptor proteins to change the ability of sugar recognition and strength of that recognition. At Lectenz Bio, we are using computational biology to develop unique reagents for detecting sugars. Through the use of computational modeling, we've developed a platform based on the directed evolution of inactivated glycan-processing enzymes for detecting specific sugars, and are using it to develop a class of novel reagents (Lectenz®) with potential for many biomedical and basic research applications. Basically, we're aiming to make glycobiology simple for bench researchers.

Do you have any recommendations to young researchers who might benefit from the use of molecular modeling tools?

The best way to start using these tools is to gain hands on experience either through an internship in a lab that is already using the tools or through taking a hands-on-course, such as we provide at the University of Georgia. Collaboration with a local group or professor that already understands the tools is also helpful, but can be less hands on. An initial method to start developing a better



understanding of computational biology tools is to search on Google and YouTube just to see what is out there and possible. More exposure can also be gained by attending conferences and looking at posters that are out of your comfort zone. Once you want to start using the tools, there is free software online for structure visualization and simple modeling. For carbohydrate modeling, our online tools can be accessed as www.glycam.org. Usually, individuals within the physical science workspace who think in terms of 3-D structures can pick up these tools quickly. Surprisingly, it is often organic chemists who are the slow to adopt modeling tools because their first instinct is not to think of the 3-D shape of structures. However, modeling is a very useful when trying to figure out why a certain reactions do not run as planned.

Wouldn't it be beneficial for vaccine companies to collaborate with labs that use computational biology?

Yes, we and others have shown that computing can be used to rationalize why one antigen does not bind to a particular antibody (specificity), or why two re more antibodies may react with the same antigen (cross-reactivity). Many chemists working in vaccine companies see the need for this collaboration and understand the benefits of bringing computational biology into their lab. However, many vaccine companies tend to be conservative, leading to upper management being unsure about the value of such a collaboration. The main obstacle for forming a commercial-academic collaboration is making sure that both sides are on the same page and clearly understand each other's expectations and capabilities. A clear, well-defined question with black and white goals also needs to be created, which can be challenging. In many interdisciplinary collaborations, there is a language barrier than needs to be overcome between the theoretical side and the experimental side of an experiment.

When your students go into industry, what kind of work are they doing?

Many students are either working with small molecule development to develop drugs or are working with protein engineering. Future employers expect candidates to be able to use the software; this has become a requirement for the job more than any additional skill. But more than that, they need to be able to assess the likelihood that a particular predicted result is correct. This requires a good deal of understanding of biophysics and computational biology. Ideal candidates can go beyond software use and can communicate with experimentalists as well as automate their work.

Employers are looking for the candidate's ability to understand the limitations in their calculations, explain any underlying assumptions, and anticipate errors or uncertainties. Automation via scripts is another useful skill that helps to standardize calculations by reducing typographical errors and increasing throughput.

As students go through Ph.D. program, do they spend more time computing or in the lab?

In my group, the distribution of time spent computing versus in the lab is split between 60/40 and 70/30. Many students come to my lab wanting to do computational work because that is what our lab has a reputation for. However, with the addition of the Biochemistry Department to the Integrated Life Sciences (ILS) program, the types of students coming into the graduate program here has become more diverse. Due to the diverse backgrounds and strengths of the students, there is a split between inclination towards computation and an inclination towards the lab. A few exceptional students excel in both areas.

Experts Converge on Atlanta to Discuss Future of Vaccines

Claire L Jarvis, PhD, Freelance Medical Writer

The International Society for Vaccines (ISV) 2018 Congress, held Oct. 28-30 in Atlanta, brought together researchers and policy makers from across the global vaccine community to share their latest advances in the field, and discuss ways to combat anti-vaccine sentiment amongst the general public.

This was the first time in its 13-year history that the Congress was held in the Southeastern United States.

"Vaccines have been a staple of modern medicine since Edward Jenner's pioneering work with smallpox in 1796, but it is relatively recently that a professional society was formed to support the vital work done by vaccinologists," explains Ted Ross, Co-Chair of the ISV 2018 Congress, from the UGA Center for Vaccines and Immunology.

The 2018 ISV Congress brought 360 attendees to Atlanta Marriott Marquis: 94 were from Georgia institutions and companies; 85 came from outside the States.

Atlanta is home to numerous research institutions that focus on global health and vaccines, including the CDC, Carter Center and Task Force for Global Health. Emory University and the University of Georgia also have strong research programs devoted to vaccination research. GeoVax is a local biotech company with 12 clinical-stage vaccine products in development.

Julie Gerberding, Executive VP Communications, Global Policy, and Population Health at Merck delivered the Congress opening keynote address. Gerberding highlighted barriers surrounding universal vaccine acceptance. Although vaccine refusal is a growing issue in the US and abroad, a greater proportion of the public experience vaccine hesitancy. Studies show that a third of parents delay scheduled vaccinations for their children, while less than 2% refuse all vaccinations.

In her keynote, Gerberding stressed that improving public trust in vaccines is the responsibility of scientists and policy makers everywhere, and social media is a powerful tool for shaping the conversation.

Another focus of this year's Congress was the prevention of influenza, with several panels and plenaries devoted to the topic. 2018 marks the centenary of the Spanish flu pandemic, which killed 50 to 100 million people. As the speakers stressed, the origins of the 1918 pandemic are still debated, and scientists need to understand historical pandemics to prepare for future global outbreaks. Atlanta-based institutions such as the CDC would lead the response to such a pandemic.

In addition to infectious and tropical diseases, scientists shared their progress towards vaccines that protect against cardiovascular disease and cancer. Many of these vaccines are still in the early preclinical development phase, not yet tested in humans.

Presentations and posters covered every stage of vaccine development, from the initial laboratory testing of biological samples to multi-year analyses of vaccinated patient populations. Much of this research is conducted in collaboration with researchers at the CDC, Emory, UGA and Morehouse.

The International Society for Vaccines is independent not-for-profit scientific society focussed on vaccines and immunisations "from bench to bedside." Founded in 1992, the society has over 600 members in 44 countries.



STEM Professionals in the Classroom

MARCH 7. ONE DAY. ONE HUNDRED CLASSROOMS. IMAGINING THE FUTURE.

What are the unanswered questions in science? What are the unsolved problems facing our community? How can students envision themselves addressing the challenges of our future through STEM literacy and via local STEM careers?

On March 7, 2019 local STEM professionals will visit metro area classrooms to give students a real sense for how science is done, who scientists are, and what questions remain unanswered. The classroom visits, by researchers, technicians, engineers, entrepreneurs, and others whose career involves the application of STEM learning, will inspire students to imagine themselves shaping the future as the STEM-literate professionals of tomorrow.

Registration for STEM Professionals for March 2019 classroom visits is now open! [Learn more and register here.](#)

Save the Date: Atlanta Science Festival

The Atlanta Science Festival is a celebration of local science and technology held March 9-23, 2019. Scientists and educators from local colleges, museums and companies will uncover mysteries and explain discoveries in hands-on activities, facility tours, stimulating presentations, and riveting performances for adults and children of all ages. [One hundred events](#) will occur across the metro area culminating with the [Exploration Expo](#), Atlanta's biggest interactive science event on March 23 at Piedmont Park. Curious? Watch a 60-second [VIDEO](#).

The Festival is seeking [sponsors](#) to support the STEM ecosystem in our community, [volunteers](#) to help produce and promote the events, and STEM professionals to visit [K-12 classrooms](#) and inspire our youth. Sponsorship includes exhibit space at our March 23 [Exploration Expo](#), which reached 25,000 people last year. We invite you to join the 200,000 people who have attended the Festival in past years to celebrate our region's STEM successes and opportunities.

For more information visit AtlantaScienceFestival.org. Stay connected by subscribing to the [newsletter](#) or following on [Facebook](#) and [Twitter](#) to receive the latest updates on events and opportunities.

ATLANTA SCIENCE FESTIVAL™

Everything You Wanted to Know About JPM Week 2019

Join BIO, Big3Bio, and MacDougall Biomedical Communications as they review the numerous receptions, conferences, and co-located events happening during JPM Week. Plus:

- Learn how to use the BIO One-on-One Partnering™ system to schedule meetings during JPM Week
- Hear about BIO's competitively priced meeting space offering in downtown San Francisco
- Discover how Big3Bio's "BioWeekSF" premium attendee resource can optimize your JPM experience
- Gain insight into best practices for navigating JPM Week

Even if you can't make the webinar, RSVP and we'll send you a recording of what you missed!

[RSVP HERE](#)

BIO is offering complimentary access to BIO One-on-One Partnering during JPM week to make it easier and more affordable to partner in downtown San Francisco from January 6 - 10, 2019.

In addition, you can schedule meetings in BIO's dedicated meeting space at the San Francisco Marriott Marquis (4th & Mission) at competitive rates. You can use the system to schedule meetings in your own meeting space or in public space for free.

[APPLY FOR PARTNERING](#) | [RESERVE SPACE](#)



LOCK IN YOUR DISCOUNT FOR BIO 2019
Open Now Through January

LEARN MORE →

Featured New Core Member: **iChek**

iChek is developing a proprietary tear film technology in the active contact lens space. The company is looking to address the issues related to glucose monitoring for those with diabetes and is also developing a contact lens for electrolytes and hydration monitoring.

[Learn more here.](#)

Featured New Supporting Member: **Medline Industries**

Medline is the largest privately held manufacturer and distributor of medical supplies uniquely positioned to provide products, education and support across the continuum of care. The ability to bring best practices from one care setting to another is what sets them apart.

[Learn more here.](#)

Upcoming Events

[Women in Bio Presents: 2018 Holiday Potluck Party](#)

December 9, 2018

[Member Benefits Webinar ft. Scientist.com](#)

December 11, 2018

[Small Dinner with Manoj Karamchandani of MPECT Inc](#)

December 11, 2018

[Webinar: On Your Mark: Your Comprehensive Guide to JPM Week](#)

December 13, 2018

[Biotech Showcase™](#)

January 7-9, 2019

[Digital Medicine & Medtech Showcase 2019](#)

January 7-9, 2019

[Industry Tour and Networking Happy Hour at Slingshot](#)

January 17, 2019

[4th Annual Biomarker and Companion Diagnostics Conference](#)

February 7-8, 2019

[Awards Dinner 2019](#)

February 8, 2019

[2nd Annual Georgia Clinical & Translational Science Conference](#)

February 28 - March 1, 2019

[Molecular Med Tri-Conference](#)

March 10, 2019

[Bio-IT World Conference & Expo](#)

March 10-15, 2019

[2019 BIO Legislative Day Fly-In](#)

April 3-4, 2019

[GA Bioscience & Health IT Career Fair](#)

April 12, 2019

[World Vaccines Congress Washington](#)

April 14-17, 2019

Welcome New Members

- Bravado Pharmaceuticals
- Health Strategies & Food Solutions LLC
- iChek
- Marpe Therapeutics
- Medline Industries
- Reprotox Biotech

2018 Champion Sponsors



KING & SPALDING

EVERSHEDS
SUTHERLAND



2018 Premier Members

Alimera Sciences
Arnall Golden Gregory
Avanos
Kennesaw State University
Mercer University
Metro Atlanta Chamber
MiMedx
MiRus
Quest Diagnostics
Recro Gainesville
Fisher Scientific
UPS