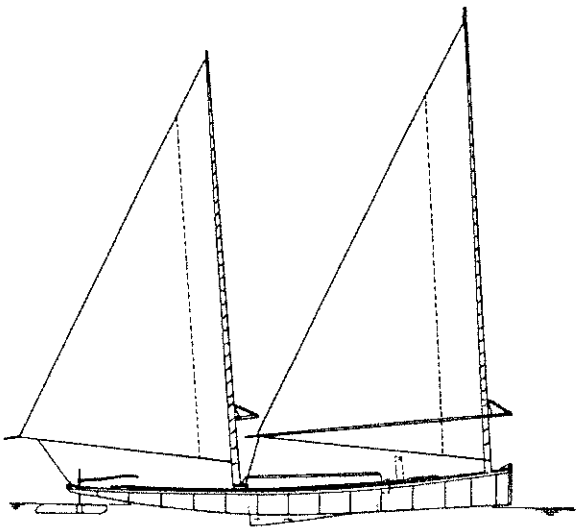

The Sound School

60 South Water Street, New Haven, CT 06519

The Sound School Regional Vocational Aquaculture Center
60 South Water Street
New Haven, CT 06519

A Regional Agriculture Science and Technology Center
Testimony for the Appropriations Committee of the Connecticut General Assembly
Legislature Office Building Room 2C
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Public Hearing – Hartford, CT

Please increase funding for agriscience programs by adopting the ECS Task Force School Choice Funding recommendation into the Governor's Proposed Budget

Students –

1. Kyrstyn Devlin
2. Elina Petrashkevich
3. Jake Colavolpe
4. Christina Samela
5. Jasmine Ayers
6. Nicole Ginter

Teacher –

George Baldwin

Members of the Legislative Appropriations Committee

Good evening ladies and gentlemen. My name is Kyrstyn Devlin and I am a student of the Genetics and Biotechnology 2 class at The Sound School. I am here today to discuss the importance of the Genetics and Biotechnology course and why it is essential to increase its funding.

The Sound School is one out of the small handful of high schools to offer such an advanced course. Many people do not believe in teaching such an advanced subject to high school students because they feel the course itself may be too challenging and do not have the proper support and curriculum to teach them. However, they obviously have not seen the work of the high school students in the Genetics and Biotechnology class at The Sound School. We are proof that teaching such a course to high school students is possible.

The Sound School is an institution that fosters scientific curiosity, values challenging young minds and has a lot of faith and trust in its students. All the teachers provide the necessary support and preparation in order for their students to excel in the field of science. That is the main reason why we are capable of excelling in the Genetics and Biotechnology course. It is extremely challenging, but thanks to the help and support of our teacher, we have been able to comprehend the information with ease and apply it to the world around us.

This class has introduced me to a field of science I had no prior knowledge or interest in. As a matter of fact, not many people know about the world of Biotechnology and the major contributions it has made to society. Thanks to the class, I know about this hidden world and have a better understanding of life around me. We have covered topics such as Genetically Modified foods, Microbiology, Agricultural Biotechnology, Evolutionary Biology, the Human Genome Project, how to properly use certain lab equipment/conduct certain lab procedures, etc. Not only do I have a better understanding of the world around me, but I teach others about what I have learned. I have such a great grasp on the subject; I have even tutored other students in AP Biology classes around New Haven. The class definitely sparked my interest in the field of science and lab work. It even gave me the opportunity to intern at the Yale School of Medicine.

I am currently interning as a Student Research Assistant at the Yale School of Medicine. The experience I have obtained interning at Yale has been invaluable. From more lab experience to important life skills, this internship has laid the foundation for my future. I now conduct PCR, genotype, and other lab procedures with ease. On a regular day, the lab manager will give me a long list of jobs to complete. I have even built up enough trust that she now allows me to complete these assignments independently. This alone has made me a more responsible individual. It means a lot to be given so much responsibility over important research projects, especially ones that may one day be published in a scientific journal. I have also developed patience through the particularly long and monotonous duties. Every day I attend my internship, I feel as though I am getting a bigger glimpse of my future in a laboratory. If nothing else, this

has solidified my decision to pursue a science career. I am currently interested in becoming an Oncologist or Medical Geneticist.

Without the knowledge and preparation gained from the Genetics and Biotechnology class and the internship I was given, I would not have found something I was so passionate about nor been capable of excelling in this internship itself. It has been a tremendous opportunity to be part of such a class and I do not know where I would be today without it.

The Genetics and Biotechnology course at The Sound School absolutely deserves to receive more funding. It is a unique class that has been nothing but beneficial. The work we are doing is more advanced than some of the AP Biology classes and we have gone above and beyond what anyone believed we would. We need the extra funding to conduct more experiments and prepare even more students for their futures in a lab setting. There are more students than internships available. By supplying the course with more funding, everyone will have more opportunities to discover what their passions are and what they see themselves doing for their future careers. Nobody should miss out on these opportunities because we do not have enough funding. We have excelled in the class itself; imagine what else we will be capable of with more funding.

As you can see, the Genetics and Biotechnology course at The Sound School is extremely important and beneficial to us. Please increase funding for the agriscience programs by adopting the ECS Task Force School Choice Funding Recommendation into the Governor's Proposed Budget. I know this is not an easy decision to make, but please, keep the Genetics and Biotechnology course at The Sound School into consideration. Thank you for your time and the opportunity to present these comments this evening.

Kyrstyn Devlin- New Haven, Connecticut

Dear members of the Committee,

Thank you for giving me the honor of representing my Vocational school at this conference today. My name is Elina Petrashkevich, and I am representing Sound School in New Haven, a place that gives the students an opportunity to pursue a unique, out-of-the-ordinary High School experience. I am in my senior year and am enrolled in a second year course of Biotechnology. It is a challenging science course that reaches far beyond a classroom education. New Haven is known as the first town to offer High School Vocational Experiences and I say that with a lot of pride in me. Having hands on experience has not only made learning much more engaging, it has also provided me with a clear path of what I would like my future to be like. After the first course, I became very interested in genetics. Conducting experiments with electrophoresis gel gave me an outlook of what I might be doing in the future. Electrophoresis is used to isolate and sort DNA based on size. An agarose gel is placed into an apparatus and the DNA fills wells. The DNA can then be extracted and analyzed. This is a simple experiment, but an informative one. It is also what had caught my interest in genetics in the first place. It was interesting to see how DNA can be manipulated and isolated. This methodology is practiced by universities and labs around the world. However, the equipment is very expensive. A simple blotting system may be around five hundred dollars not to mention the cost of the gel. If my school had the opportunity to get updated equipment or more materials, not only would more experiments be conducted, but there would be a stronger desire to learn and would better prepare us for careers in an ever-growing field. My classmates and I share a belief that learning can be difficult, but it is made easier by experiential learning.

Needless to say, money is an issue and might always be, however with increased funding, this program can blossom and provide students with inspiration and education at the same time. Please increase funding for agri-science programs by adopting the ECS Task Force School Choice Funding recommendation into the Governor's Proposed Budget. Our School truly needs to uphold the opportunities that it has been providing from the turn of the century. Thank you for this opportunity to present my ideas and proposal to help better my school and its future students. I hope you truly consider this idea.

Sincerely,

Elina Petrashkevich

Good Evening,

Thank you for the opportunity to appear before the appropriations committee today.

My name is Jake Colavolpe and I am a junior at The Sound School in New Haven.

I am here to talk to you tonight about how my place in my school's biotech program has been vastly important for me.

I am currently an intern at the Connecticut Agriculture Experiment Station (CAES) lab working specifically on fungal pathology under Dr. Wade Elmer. While the work being done here is not only new to me, but also to the field, foundations acquired in my biotech class allowed me to begin working in the lab on the first day, something that many would not be able to do.

These foundations; lab technique, sterile procedure, and even a passion for science, would not have been acquired without the hands on experience in our school lab. From the first day, we began learning aseptic technique and pure culture. From then, our skills developed producing not only educated, but also capable students; students who are able to complete experiments in the lab with such comprehension that can only come with experience. It is these incredibly important career skills, if nothing else, that exhibit the necessity of funding for our, and others' VoAg programs.

Undoubtedly, all of these hands-on experiences are costly. With an increased budget, these experiments to gain highly important life and career skills can be continued as well as broadened, to produce a college and work-force ready group of students.

Personally, these opportunities have prepared me for Connecticut's growing biotech industry. Expanding our budget will in turn help us to expand our experiences and education, to keep up with the rapidly increasing job market. My future, the future of the students in this room, as well as those to come, all rely on first-hand experiences.

I ask you, on behalf of these students, to provide funding for agri-science programs by adopting the recommendation into the Governor's Proposed Budget. Thank you.

To members of the appropriations committee,

My name is Christina Samela and I attend The Sound School Regional Vocational Aquaculture Center in New Haven, CT as a junior. Thank you for providing the opportunity to present information pertaining to the proposed legislation regarding the importance of funding a well-developed Biotechnology curriculum to high school students. I chose to take Biotechnology because I have an interest in the material and I was impressed by what I had heard about the quality of the curriculum. Throughout the course we were taught many aspects of Biotechnology such as DNA replication, extraction, and cloning, viruses, conjugation, and genetically modified organisms (GMOs), and also proper lab technique for utilizing equipment such as micro-pipetters, vortexes, an autoclave, electrophoresis boxes, and spectrophotometers. One of the experiments we conducted was extracting DNA from wheat germ and measuring the quantity and purity of its precipitate. We used a variety of the pieces of laboratory equipment stated previously throughout this experiment, and we were fortunate that this was possible and that we had such equipment available to us. However, the school has had this equipment for many years, and it may no longer have the aptitude to function at its prime. The Sound School is a comprehensive town-funded high school which houses the VoAg program. Due to this, minimal funds are allotted to the Biotechnology program each school year, and that amount is not enough to cover the costs of purchasing and maintaining enough optimally functioning equipment to provide students with a thorough understanding of concepts of Biotechnology.

Please increase funding for the agriscience programs by adopting the ECS Task Force School Choice Funding recommendation into the Governor's Proposed Budget. I appreciate this opportunity to appear and I hope you will take time to consider my comments.

To the members of the Appropriations Committee:

My name is Jasmine Ayers and I am a junior at the Sound School in New Haven. When I joined the Sound School, I had no idea what I wanted to do with my life. But this school and its unique curriculum, namely the biotech concentration, led me to what started out as an interest but became a fascination and potentially my future career.

I had never thought about microbiology prior to this program. It's an obscure field of study, especially for one that so greatly impacts every human being alive on the planet. My first exposure was via reading a book, *The Hot Zone,* which I just happened to find in the library (I later became aware that this book was only present in the library because our biotech teacher had ordered several copies for a reading assignment he gave to his class.)

It was *The Hot Zone* that made me sign up for biotech, and I am indelibly grateful. What the book made a vague interest, the class made something I could actually see myself doing. Biotech class is so compelling to me because it includes a huge amount of hands on learning. The equipment the Sound School has, which is as far as I can see is unique to us among New Haven high schools, allowed my class to perform labs such as the genetic transformation of bacteria. We inserted jellyfish genes into E. coli, creating bacteria modified to fluoresce green. This and other experiences were fascinating and of course perpetuated my interest in the field. They also gave me lab skills, things like sterile technique, plating bacteria, pippetting, microscope use, and autoclave procedures, which are obviously attractive qualities in a prospective intern or employee in a microbiology lab. The skills I learned in this class are already working for me; I have found an internship in a Yale lab working on using modified viral proteins to increase cellular resistance to the HIV virus. I am unbelievably excited to spend a summer doing what I love- and even more pleased to be doing work that could realistically have a big impact on medicine and maybe save lives before I even graduate high school.

I believe that giving students the opportunity to participate in biotech programs like the Sound School's is immensely important. Not only because I want everyone to be able to discover something they genuinely can't wait to join the workforce and start doing like I have, but also because society at large needs more people educated in and committed to this field. As I said before, microbiology and biotech in general are perplexingly obscure. Many, if not most kids don't even think of careers in this field as a viable option for them. But the need for us is only growing- mankind will always be plagued by infectious diseases that need vaccines, treatments and cures. Droughts, pests, and plain population growth will always cause famines, famines that can be prevented or at least reduced by engineering hardier, more efficient crops. The list goes on. Programs like the Sound School's offer amazing opportunities for the students enrolled in them, but they also provide opportunities and benefits for everyone else by bringing new minds into a field that will affect and can improve quality of life for everyone.

Please increase funding for biotech and other agriscience programs by adopting the ECS Task Force School Choice Funding recommendation into the Governor's Proposed Budget.

I greatly appreciate the opportunity to present this testimony to you and I hope you find it helpful during your budget discussion.

Nicole Ginter

My name is Nicole Ginter and I am a junior at The Sound School Regional Vocational Aquaculture Center. I appreciate the opportunity to present some information about our VoAg funding. In the future I would like to go into the medical field, specializing in Nursing. In class we've worked on how genetics make up the human body. In biotech class this year I learned about all the different types of mutations. For example, in a frameshift mutation, the genetic code gets all jumbled around, which throws off the genetic code. These kinds of mutations can cause infertility. Some labs that we have done include DNA extraction from wheat germ, DNA fingerprinting and sampling bacteria into cultures to grow them out. We used micropipetters, weighing tables and votrexs. The micropipetters are used o measure small amounts of liquid. Vortexes are machines that vibrate when you apply pressure to completely mix the test tubes. All of these materials and utensils cost a lot of money and are important for biotech experiments. Something I'd like to see is more experiments to do with DNA so I can expand my knowledge on DNA and genetics. Please increase funding for AgriScience Programs by adopting the ECS Task Force School Choice Funding recommendation into the Governors Purposed Budget. I appreciate this time to present this information and I hope it goes into consideration. Thank you.

To the members of the Appropriations Committee:

My name is George Baldwin and I teach Genetics & Biotechnology at the Sound School Regional Aquaculture Center in New Haven. In our classes, we learn about subjects such as genetics, microbiology, DNA and protein synthesis, and recombinant DNA technology. Students in my labs perform skills such as electrophoretic analysis (DNA fingerprinting), aseptic technique and pure culture of bacteria, gram staining, micropipetting, measurement, microbiology media preparation, plate streaking, lab reports, autoclaving and genetic transformation of bacteria.

I've placed students into internships at Yale University, working on genetic causes of congenital heart defects, hormonal influence on obesity and the role of Hox genes in embryonic development. I've placed student interns with the National Marine Fisheries Service on research with disease-resistant shellfish and oyster spawning. Others work with the Connecticut Agriculture Experiment station on the role of Fusarium fungus on marsh grass dieback. We've done collaborative projects with the University of New Haven on the use of bacteriophage viruses to combat tuberculosis, and with using bacteria to control Lyme disease-bearing ticks. We've collaborated with Keck Laboratories on comparative oyster proteomics in Long Island Sound.

In the last few years, I've had students go on to higher education and careers in aquaculture, oncology, neurology, evolutionary biology, forensics and genetics. These students were better prepared than most in laboratory techniques and lab reports, and many have already obtained experience working in some of the best research laboratories while still attending high school.

We would like to expand into areas such as gene sequencing and polymerase chain reaction (gene cloning), expanding our abilities to collaborate with local universities and industries, and have been talking with consultants on doing so. The biotechnology industry is making great inroads into agriculture. We'll need to feed a projected 9 billion people on this earth by the year 2050, with shrinking water supplies and arable land. We need to reduce the need for chemical fertilizers and toxic pesticides. We need more effective ways to combat infectious disease and genetic maladies. We need to strengthen our industry with biomimicry and proteomics. The science of biotechnology is growing and splitting into more and more specialized branches. We need to teach students the basics at an earlier age, to prepare them for the growing intricacies of the present science and the future.

Connecticut has a great chance to expand its economy into biotechnology and compete with other states and countries (Germany, Singapore, South Korea). We have many great local universities and many biotech companies we can work with to prepare students for jobs ranging from lab techs to PhDs in research. The industry is currently top-heavy with PhDs, without enough experienced lab techs to support it. We can provide this labor force, providing jobs for those who choose not to pursue a four-year degree as well as contribute future leaders in the industry.

We have some equipment from initial grants but need to update and expand our repertoire. Consumable materials and equipment maintenance is costly, and our budget is minimal. We often rely on simulations because of lack of funding for supplies. Biotechnology is a perfect way to expand Connecticut's economy and capitalize on our local universities and labor force. Please consider expanding our funding and expanding Connecticut's opportunities.