





March 2017

The Genomics Zone was a themed zone funded by Genentech and Human Longevity, Inc. The zone featured scientists working on a range of genomics related topics from genetic diseases in children to cancer. The zone had 329 participating students from 13 schools. Class sizes ranged from 5 to over 30 students across grades 4 to 11. Most of the classes had two live chats with the scientists with more live chats taking place in the first week than the second.

There were more questions submitted in the genomics zone than average during events and there was also more activity in live chats. The live chats were well attended, with the students from one school, Wyoming Virtual Academy, all logging on from their individual homeschool locations. All the scientists were very engaged and quick to reply to the students' questions with very detailed answers. They were very willing to interact, creating a dialogue of answers in response to ASK questions, corroborating answers, and supporting each other.











UMAN ONGEVITY,

PAGE VIEWS	GENOMICS ZONE	USA ZONES AVERAGE
Total zone	17,835	19,336
ASK page	838	1,362
CHAT page	1,261	2,128
VOTE page	1,373	2,088

<u>Key figures from the Genomics Zone,</u> <u>and the average of the USA zones</u>

Popular topics

The Genomics Zone featured a range of conversations and questions on genetics and genomics and the students also showed a considerable interest in the scientists themselves. The students focused many of their questions and conversations on the specific work of the scientists. The scientists covered a wide range of topics in ASK and CHAT, from the number of genes

	GENOMICS ZONE	USA ZONE AVERAGE
Students	329	301
% of students active in ASK, CHAT or VOTE	78%	81%
Questions asked	517	404
Questions approved	297	245
Answers given	358	415
Comments	30	53
Votes	224	333
Lines of live chat	5,506	4,352
Live chats	16	16
Average lines of live chat	334	268
Schools	12	12

in humans to the coding language used by the scientists. The students frequently demonstrated that they had carefully read the scientists profiles in advance and prepared questions. They were interested in finding out what it is like to be a scientist as well as bigger questions such as "Are we alone in the universe?". Conversations during chats covered similar subject matter as the questions submitted to ASK, namely genetics, coding and cancer, though the actual questions were quite varied. The scientists often provided a variety of perspectives and information to answer the questions of individual students in both chats and the ASK section, commenting on the questions and developing further interactions. Many students asked the scientists how they got interested in their area of work and what they found most interesting about it. The students also expressed an interest in gender issues related to science and wanted to know how the scientists work helped the planet. The preponderance of excellent live chat interactions is evidenced by the many examples of good engagement listed in this report.















Examples of good engagement

All of the scientists were very good at engaging students in the live chats. The genomics zone chats featured lots of science questions and students focused on genetics and conversations about the research being conducted by the scientists. The students also asked about the scientists' careers, personal lives and interests.

Questions about genetics and genomics

"What is a genome? ⁽⁽⁾ – **Abigail and Marisol, students** "Genome is the complete set of genes, genetic material of an organism." – **Sahra, scientist**

"what kind of genes do you manipulate?" - **Student** "I have manipulated genes that are involved in addiction." – **Candace, scientist**

"What is RNA?" - **Student** "RNA is ribonucleic acid, it is a messenger of information from DNA to express amino acids that make up proteins!" – **Sahra, scientist**

"When, where, and how are genes expressed?" - **Student** "Perfect question! It all depends on the organism that which genes express where. Your skin and muscle has the same DNA! but the genes are expressed differently." – **Sahra, scientist**

"why do you study genes aquire new functions?" – **Student** "We want to figure out how new functions occur and become important. That's a very fundamental question :)." – **Sharon, scientist**

Questions about coding

"What kind of coding do you do?" - **Student** "I use Python to parse my file, and R to analyze my data :)" – **Sharon, scientist** "Me too! Go Python and R :)" – **Sahra, scientist**

"Does coding ever get hard or frustrating?" – **Student** "Definitely, sometimes when I need to do a calculation that I have not done before, it takes some time to solve it. Or when I try to plot my results in a graph using coding, it takes some time to adjust the colors and other parameters." – **Sahra, scientist**

"Matthew, what kinds of things does the computer code analyze?" - **Student** "We look for differences in the DNA of the kids we sequence. We compare their DNA to an un-sick person. We then try to figure out if these changes make the kid sick or do nothing." – **Matthew, scientist**

Questions about the scientists' work

"What do you hope to achieve in your research?"- Student
"We are trying to cure melanoma - which is a skin cancer" – Jennifer, scientist
"Have you gotten far in your research?" – Student
"Yes we have gone from having an idea to now treating cancer patients- that took about 3 years to accomplish" – Jennifer, scientist



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"why so u scan brains?" - Student

"I scan brains to learn how they work and how other things affect how the brain works. It is really cool!" – Candace, scientist

"what kind of diseases did you succeed in finding out about?" - **Student** "A disease called dystonia, where you msucles are cosntantly tense, a disease called LVNC, which is where your heart muscles don't work right, a disease called BRS, which makes kids really really sick and unable to eat." – **Matthew**, **scientist**

"what will you do in future experiments?" - **Student** "I would look at how natural selection act on gene duplicates:)." – **Sharon, scientist**

"what's your favorite thing about your jobs?" - Student
"My favorite part is coding!" – Sharon, scientist
"Same here, I also enjoy coding, it is like solving puzzles" – Sahra, scientist

"what changes did you give the chicken you modified?" - Student
"They ended up having less feather than normal ones." – Sharon, scientist
"neat!" - Student
"Other than that, they are completely normal. We're studying the development of feather. So that's kinda what we wanted :)" – Sharon, scientist

"Would your research help anyone with mental issues like insane?" - **Student** "That's a good question. Insanity isn't a technical diagnoses that we use but I think I know what you mean. My research has the potential of helping a wide range of mental illness, including psychosis." – Candace, scientist

"What is the point of your work from a kids point of veiw?" - **Student** "My research involves understanding roles of different regions in genomes, particularly plants! :)." – **Sahra, scientist**

Questions about careers

"what's it like being a woman in the science field?" - Student

"I don't think it's different than being a boy in science:) I'm very happy" - Sharon, scientist

"That's great to hear! In my last school there were only a couple girls interested in science. It was a guy thing, sadly. So I wasn't sure. Thanks!" – **Student**

"It's exciting being a woman in science. I think it is really important to have female mentors. It is really important to understand the way women typically act towards peers, bosses, interviews, promotions, etc. It is crucial to get mentoring through" – **Candace, scientist**

"It's NOT" - Sharon, scientist

"what do you wish you had known before you had gotten into science" - Student

"Great question, I wish I knew the long process of publishing a paper" - Sahra, scientist

"It's very very important where you study and who you study with (i.e. who you pick to be your boss). And it's hard to know who the right person is when you're young" – **Matthew, scientist**

"I wish to know that professors could get fired at the very beginning of their career if they don't do well..." – Sharon, scientist







Questions about being a scientist

"How long have you been a scientist." - Student

"It's hard to answer that! I started doing science at 21, so I guess I have been a scientist for 9 years!" – Candace, scientist

"Is your work fun?" - Student

"I enjoy it so much. Everyday is different. I love to teach and to do experiments. It is always fun!" – Candace, scientist

"What did you do today?" - Student 1

"I had some meetings today, where we discussed projects related to tomato genomics :)." – Sahra, scientist "Is there anything really special about tomatoes?" – Will, student "@Will Yes, tomatoes are important components of our food and learning as a plant how it develops and responds to environment helps us to improve production." – Sahra, scientist

Questions about the scientists

"DO you like rollercoasters?" – Student
"nope-I LOVE THEM" – Jennifer, scientist
"Me too!!! All about Six Flags!!!" - Student
"There is an awesome place in Ohio too!" – Jennifer, scientist
"What is it?" – Student
"Cedar point I think?" – Jennifer, scientist
"Whaaaaaaatttt!!!! That is even better than Six Flags, have you been on Mellenium Force?" – Student
"Yep" – Jennifer, scientist
"That is ssooooooo CoooooL!!" - Student

"Have you ever tried teaching students about genes? Or meet children in real life? (And do you like Naruto?)" - Student

"Yes, I volunteered a curriculum mentor in the science summer camp last year. I taught for three weeks. Yes, I like Naruto!" – Sharon, scientist

"Oh my gosh I love you. Q: What kind of genes have you studied in your four years of work?)" - Student

"I studied the genes related to early embryonic development :) " - Sharon, scientist

"Wow nice! One more: Have you studied genes with cancerous cells?" - Student

"Yes, lung cancer cell line. When I was in college." - Sharon, scientist

"I think I know who's getting my vote :p You're basically my favorite (no offense to other scientists ~_~)"- Student







Schools and students







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HUMAN LONGEVITY, INC.

Scientist winner:

Jennifer's plans for the prize money: "Teach schools about Bioinformatics and Cancer- especially in the small towns near where I grew up."

Student winner: Justin, Mar Vista Academy

For great engagement during the event, a student from Mar Vista Academy will receive a gift voucher and a certificate.

Feedback

Here are a few of the comments and tweets made during the event and in the evaluation surveys.

"Thank you all so very much; you are the greatest human beings that have ever lived in the history of the universe." – **student**

"Thank you for your time an have an amazing day and good luck on finding your research you guys are very important to the world just know that." – **student**

"thank you!! You are all AWESOME!!" – student

"The students loved it! Did not really know what to expect, but it was great. Thank you so much!" – Caroline Hickerson, Teacher, Wyoming Virtual Academy

"Great Program!" – Frank Benenati, Teacher, Southern Cayuga School District

"The live chat feature is cool because they can build on questions from other students." – Stephanie deBiasio, Teacher, Hamilton Middle School

9	deLuca Wow! look	at my students go!
	Alicia Johal	Following
a	@AliciaJohal @imascientistUS @MsVe	enturino @genentech
@ st	humanlongevity Thank udents were so excited,	you all!!! The , engaged and happy!
3:52	2 PM - 15 Mar 2017	

"I'm a Scientist is great!! It was very fun and rewarding to participate in this program." – Sahra Uygun, scientist

"I like that we can reach out to students anywhere! Growing up in a small town I would have loved to do have been able to do this in my class. It's really important that students get to ask any question they want and we can try to answer it!" – Jennifer Hintzsche, scientist

"I just think it's important to educate people about science and foster kid's interest in science" – Matthew Bainbridge, scientist

"Thank you so much! It's a wonderful experience! You guys are awesome!" – Xueyuan Jiang, scientist

Mari Venturino @MsVenturino 19m

My kids are having so much fun right now! We're chatting with scientists! #SUHSD #SUHSDlearns





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Liana Gertzer

@imascientistUS @genentech

@humanlongevity Having a great time chatting, so glad we got a second chance to chat!

stephaniedebiasio Thanks for letting us keep chatting.

stephaniedebiasio the three that can stay in the lab are stoked!

stephaniedebiasio Most of them were asking good ques tions! super engaging when we got going.



deLuca @Matthew and @Tristan, you all blew the students away today! I was so proud of them! It takes a lot for us t o set everything up to ask the questions, that's why this group was firing fast! I had them writing things down for day s!

deLuca @Tristan if you remember, all of the students are physically handicapped. One of them kept asking about ani mals. This past summer, we were able to get her in a camp program that showed them all about animals. she dissect ed a few.

"The best thing was watching students get really excited about what the different scientists said. Another great thing was listening to the insightful questions that my students came up with." – Jamie Hurlbut, Teacher, Vestal Middle School

Following

"Students were able to see scientists as real people, not names in a textbook. The kids get to interact with scientists who are working in the field and for the students to see what type of work scientists do. I really liked how patient the scientists were with the immaturity of the students. They treated them with respect." – Liana Gertzer, Teacher, Clarkstown High School North





