

AACR Award to High School Student For Work Researching Her Own Cancer

BY ERIC T. ROSENTHAL

SAN DIEGO, Calif.—The American Association for Cancer Research, which has long supported young cancer researchers, honored an even younger one, a high school senior, with its first “AACR Junior Champion in Cancer Research Award” at this year’s Annual Meeting here.

Elana Simon, an 18-year-old survivor of fibrolamellar hepatocellular carcinoma, was recognized for her role in studying her own rare cancer, which resulted in a paper she coauthored in *Science* (2014; 343:1010-1014).

Diagnosed at age 12 after more than a year of frustrating misdiagnoses including lactose intolerance, Crohn’s disease, appendicitis, and stress, Simon was successfully treated through surgery at Memorial Sloan Kettering Cancer Center by Pediatric Surgical Service Chief Michael P. La Quaglia, MD, another coauthor of the study. The paper reported a gene flaw involved in the rare liver cancer, which is diagnosed in only about 200 young adults worldwide each year.

The genetic flaw she helped discover was a break that fused part of one gene to part of another one, causing a chimeric RNA transcript and protein. This abnormal protein was found in all 15 tumors studied, but not in normal liver tissue, suggesting that it might fuel cancer growth.



AACR/Todd Buchanan

The team was spearheaded by Simon, now a senior at the Dalton School in New York, who had been inspired by a sophomore year internship at a laboratory at Mount Sinai Hospital that used her computer science skills to help sort genetic mutation data for pancreatic cancer.

In addition to Simon and La Quaglia, the team included gene specialists from the New York Genome Center (NYGC); her father, Sanford M. Simon, PhD, Professor and Head

of Rockefeller University’s Cellular Biophysics Laboratory; members of his lab; and another survivor who preferred not to be identified.

Elana Simon was “co-first” author with Joshua N. Honeyman, MD, a pediatric oncology surgery fellow from MSKCC working in the Simon lab, and NYGC’s Nicolas Robine, PhD, with Sanford Simon serving as senior author.

During an interview at the AACR meeting I met with Elana, as well as her father and mother, Rachael Migler, a writer.

Her older brother Joel did not travel west from Carnegie Mellon, where he is an undergraduate, but when he was just 15 he apparently posed some interesting insights into approaching Elana’s treatment, and will be a coauthor with his father and others on another scientific paper.

Elana was keynote speaker at AACR’s “Special Program for High School Students: The Conquest of Cancer and the Next Generation of Cancer Researchers.”

She received her AACR Junior Champion award at the conference’s opening plenary session, which featured a video (<http://bit.ly/1kL36VP>) of her story.

ELANA SIMON, (left) receiving her award from AACR 2013-2014 President Charles L. Sawyers, MD; and (right) giving her acceptance speech.

She said that when she applied to work in the Mount Sinai lab to sequence genes she did not let anyone there know that she was a cancer survivor or that her father was a scientist.

Nor did her father or mother have any idea that their daughter was involved in cancer research. It turned out that since she was so busy with various extracurricular activities she was able to use dance as a cover for her cancer research.

Sanford Simon said when a teacher told him how well his daughter was doing on her school project, he immediately assumed it involved her dancing, and only learned then of her time in the lab. “I was so proud,” he said, adding that he wanted to respect his daughter’s space.

Elana said that she was initially reluctant to work in her dad’s lab at Rockefeller University because she didn’t want to appear to be there because of familial ties. But when she thought about using her computer skills to sequence the rare cancer she began working in the Simon Laboratory, as well as with La Quaglia and colleagues

from NYGC, who genetically mapped the samples.

She said she reasoned that it would be easier to identify genetic mutations in the tumors of young patients rather than older ones since the genome would be altered by years of aging and environmental factors. Since no cancer registry was available for fibrolamellar hepatocellular carcinoma, La Quaglia provided samples from other patients and Elana used social media to reach out to other patient groups.



AACR/Todd Buchanan

Funding was provided by the Fibrolamellar Cancer Foundation (FCF) as well as individual donors touched by the disease, with additional support from the Howard Hughes Medical Institute, NYGC, Rockefeller University’s Center for Clinical and Translational Science, and through an anonymous gift to Rockefeller University. Sanford Simon now serves as Chairman of FCF’s Scientific Advisory Board.

Research is continuing at the Simon lab to test the effects of the chimera on human liver cells and mouse livers. The Simons are also setting up a patient registry, and Elana and another young survivor are featured in a video (<http://bit.ly/1iewL6a>) explaining why they are involved in recruiting patients.

The Simons said that within 36 hours after the *Science* article was published they received confirmation of the same sequence from researchers at Washington University, and later from the University of Washington and Stanford University.

“I’m totally thrilled with the cancer research community’s cooperation,” Sanford Simon said. “It had the feeling of a community of people.”

He said that earlier this year he received a call from AACR 2013-2014

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Cancer Screening & Care in Transgender Patients: What's the Same, What Should Be Modified

BY HEATHER LINDSEY

“Despite the many obstacles, transgender patients are highly motivated to access cancer health care and transgender health and community support.”

NEW YORK—Cancer screening in transgender people may sometimes require a modified approach to current guidelines, according to researchers at a meeting here at Memorial Sloan Kettering Cancer Center focused on cancer in lesbian, gay, bisexual, and transgender (LGBT) communities. In addition, speakers noted, patients may also have to contend with obstacles to culturally competent cancer care, as indicated by survey results from the Cancer’s Margins project of the University of British Columbia.

Little Research Available

Only a limited body of research is available concerning the biomedical aspects of cancer care for transgender patients, said Evan Taylor, MSW, a doctoral student in the Centre for Cross-Faculty Inquiry in the Faculty of Education Program at the University of British Columbia and Research Assistant for Cancer’s Margins.

Although some case studies have pointed to an increased cancer risk from hormone treatments in transgender populations, this has not been definitively addressed in large trials, he noted. Case studies also recommend modifications to some routine cancer screenings, he said.

Another speaker, Ronica Mukerjee, FNP, Lac, MSN, MsA, NP, an acupuncturist at Collective Primary Care and the former Director of Transgender Health for Community Healthcare Network in New York, said that because studies of transgender people are lacking, providers generally follow the screening guidelines published by organizations such as the U.S. Preventive Services Task Force (USPSTF) and the American Academy of Family Physicians and may make modifications based on extrapolated

data—for example, studies of postmenopausal women on hormone-replacement therapy.

Cancer Mortality Not Increased

Notably, a 2011 study (*Eur J Endocrinol* 2011;164:635-642) of 966 male-to-female (MTF) and 365 female-to-male (FTM) individuals, found that there is no increased cancer mortality in these populations, she said. However, the rates of lung cancer were significant higher, possibly due to heavier smoking in these individuals.

“You’ll see that trans patients smoke more than the LGB population,” she said. Consequently, health care providers should screen their transgender patients for past or present tobacco use. Poverty, stressful living, and lack of employment are often factors that transgender individuals are coping with and that contribute to the likelihood of smoking.

The rates of hematologic malignancies were also shown to be higher in the

2011 study, and researchers theorized that this might have been due to HIV-associated non-Hodgkin lymphoma.

Screening in FTM patients

Female-to-male transgender people need to receive gynecological pelvic and chest or breast care, Mukerjee continued. For cervical cancer screening in this population, health care providers should follow the guidelines of the American Society for Colposcopy and Cervical Pathology (ASCCP) for Pap smear.

“There’s no evidence that testosterone increases or reduces the risk of cervical cancer,” she said. If the patient is low risk based on HPV status,

precancerous lesions are also unlikely to be present. However, pathologists may find a higher prevalence of parabasal cells, which are associated with atrophy in postmenopausal women. If patients have undergone a hysterectomy, providers should find out if the cervix was kept. If it was, then a Pap smear needs to be performed.

Physicians and researchers often wonder about an elevated risk of endometrial and ovarian cancer in FTM patients, Mukerjee continued. “There’s a lot of unknowns in this area, but we do know that there’s no real evidence that taking testosterone leads to endometrial hyperplasia or proliferation.

“What we’ve seen in the small studies that are out there is that there is an atrophic effect of androgen on the endometrium, and PCOS [polycystic ovarian syndrome]-like changes are more prevalent with testosterone,” she said, citing *J Sex Med* 2009;6:3193-3200 as one example.

Overall, uterine histology is not very different in this population, except for the lack of proliferation and menstruation, she said. Researchers can extrapolate that if there’s not a lot of cells growing, then there is less likelihood that someone is going to get a cancerous growth.

“There is, however, some weak evidence that PCOS may increase ovarian cancer, and with testosterone usage the risk of PCOS is greater,” she said. Additionally, transgender patients older than 40 and with a family history of the disease are also at elevated risk. In general, the USPSTF guidelines for ovarian cancer screening do not extend beyond performing a bimanual examination.

Some physicians may want to recommend a hysterectomy or an oophorectomy as prevention in FTM patients, Mukerjee said, adding that such a recommendation requires a comprehensive conversation with the patient about the procedure’s implications—“Still, it might be something that the patient wants.”

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ELANA SIMON

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President Charles L. Sawyers, MD, whose lab at Sloan Kettering is across the street from Rockefeller. “Charles said that he saw Elana’s interview on *Wall Street Journal Live* [<http://on.wsj.com/1sVQEUt>] and thought she’d be a good role model for other kids. He called me first because he didn’t want to overwhelm her or seem as if he were taking advantage.”

When Sawyers called Elana he asked if she would be interested in talking in front of a large audience about research

and the importance of investing in it, according to Elana, who said there was no mention of a special award at that time.

Elana told *OT* that for years following her diagnosis and surgery she had pushed being a cancer survivor out of her life. “When people asked about my big scar I’d tell them it was from a shark bite because I didn’t want them to pity me,” she said. “I wanted the scar to go away, and I bought as much scar tape as I could.”

But a summer at Camp Simcha, a Jewish-run camp for children with cancer and other hematologic illnesses helped transform her into a proud survivor.

“I no longer felt like a victim and came to accept my scar,” she said, writing her college essay about how the camp helped her accept her scar.

And that essay contributed to her acceptance at Harvard University, where she will start in the fall, expecting to major in computer science. ■