

SALT LAKE CITY MOSQUITO ABATEMENT DISTRICT

Executive Director's Report

January 2023

1. Personnel:

Personnel	
Staff	Seasonal
10	4

Type of Work	2023	3 - Year Average
Adulticiding	0.00	0.00
Wetlands / Rural	1.00	0.33
Fish Culture	28.50	34.33
Catch Basins / Gutters	0.00	0.00
Tree Holes	0.00	0.00
Service Request	0.00	0.00
Traps	80.00	0.67
Laboratory	156.00	135.25
Office / Administration	827.50	567.08
Equipment Maintenance	242.00	184.67
Facility Maintenance	154.25	160.25
Training	30.00	25.67
Education	13.50	13.33
Unmanned Aerial System	2.00	N/A
Other / Errands	78.50	132.33
Comp. Time Used	132.75	70.08
Vacation	164.25	126.00
Additional Hours/Overtime	0.00	11.83
Holiday	240.00	186.67
Sick Leave	30.00	53.42
Total	2,180.25	1,701.91

2. Office Activities:

- Executive Director Faraji, Assistant Director White, Laboratory Director Bibbs, and Education Specialist Rehbein met with Dr. Norah Saarman (USU) on 3 January 2023 regarding grants and collaborative projects.

- Education Specialist Rehbein submitted a grant proposal for the UT STEM Action Center Community Impact Sponsorship grant on 3 January 2023 for a youth/community garden program (she was notified on 23 January 2023 that this will be funded for \$3195).
- Executive Director Faraji and Education Specialist Rehbein reviewed applicants for the Moab MAD on 3-4 January 2023.
- Assistant Director White completed registration of the District in the SAM granting system on 4 January 2023.
- Education Specialist Rehbein attended an AMCA YP Committee meeting on 4 January 2023.
- Laboratory Director Bibbs conducted orientation for new Science Research Initiative students (Irvane Nelson, Jacob Baltier, Kai Casci) on 9 January 2023.
- Executive Director Faraji and staff attended the CDC NOFO webinar on 10 January 2023.
- Laboratory Director Bibbs conducted a staff meeting for the Science Research Initiative on 10 January 2023.
- Executive Director Faraji and Assistant Director White attended the monthly manager's meeting of the Utah Mosquito Abatement Association on 11 January 2023.
- Executive Director Faraji, Assistant Director White, and Operations Supervisor Hardman met with Cody and Mike (Commercial Beekeepers) regarding access issues at the District on 11 January 2023.
- Urban Field Supervisor Sorensen attended and presented at the Florida Fly In on 11-13 January 2023.
- Executive Director Faraji, Assistant Director White, and Operations Supervisor Hardman met with Jim Grambler and John from the Southshore Waterfowl Management Association on 12 January 2023.
- Laboratory Director Bibbs conducted a presentation for the Montana Mosquito and Vector Control Association on 12 January 2023.
- Executive Director Faraji received the DSLASA audit proposals on 13 January 2023.
- Nate Byers, CDC Fellow and potential applicant for our Biologist position, visited the District on 17-18 January 2023.
- Executive Director Faraji met with representatives from the University of Utah's Public Health Department regarding the CDC NOFO on 17 January 2023.
- Executive Director Faraji and staff met with representatives from the Ouelessebouyou Alliance on 17 January 2023.
- Executive Director Faraji met with representatives from the State of Utah Public Health Department regarding the CDC NOFO on 17 January 2023.
- Executive Director Faraji and Assistant Director White met with Dr. Norah Saarman (USU) regarding the CDC NOFO on 17 January 2023.
- Executive Director Faraji and Assistant Director White met with professors from the BYU Public Health Department on 17 January 2023 regarding the CDC NOFO.
- Jared Arnold and three members of his staff from Rexburg, Idaho visited the District on 18 January 2023.
- Laboratory Director Bibbs provided surveillance data information to Dr. Sam Rund from Notre Dame on 18 January 2023.
- Laboratory Director Bibbs and Education Specialist Rehbein conducted a presentation on mosquitoes and mosquito-borne pathogens to the Hogle Zoo staff on 19 January 2023.

- Education Specialist Rehbein attended a quarterly Designated Safety Officer meeting through the ULGT on 19 January 2023.
- Executive Director Faraji met with Dr. Emmanuel Santa-Martinez from the Salt Lake Community College regarding grants and partnerships on 23 January 2023.
- Executive Director Faraji and Assistant Director White met with Dr. Neil Vickers (UU) and Dr. Norah Saarman (USU) regarding the CDC NOFO on 23 January 2023.
- Education Specialist Rehbein attended an AMCA YP Committee meeting on 23 January 2023.
- Assistant Director White conducted an interview with Clarke Mosquito Control on 23 January 2023.
- Operations Supervisor Hardman, Rural Field Supervisor Salt, and Seasonals Branham and Witmer attended and participated in a Science Fair judging event at the Reed School on 25 January 2023.
- Education Specialist Rehbein attended an ARSET (NASA) webinar on connecting Citizen Science with Remote Sensing on 24 January 2023.
- Laboratory Director Bibbs conducted conference calls with Dr. Amanda Hoepffner (UU CEL) and Dr. Josh Steffen (UU SRI) on 26 January 2023.
- Education Specialist Rehbein met with Carrie Schwarts on 26 January 2023 to discuss Science Moab and their support for our CDC NOFO grant.
- Education Specialist Rehbein attended an AMCA YP Outreach Taskforce meeting on 27 January 2023.
- Executive Director Faraji, Assistant Director White, and Education Specialist Rehbein attended and presented at the Mosquito and Vector Control Association of California annual conference on 29 January to 2 February 2023. Education Specialist Rehbein remained on location and visited Greater LAMVCD to shadow their education program team and also met with May Joy Coburn, Director of Communications.
- Laboratory Director Bibbs conducted an introductory call for a UU Conservation Biology CEL student on 31 January 2023.
- CFO Fairbanks attended the ULGT's Human Resources Summit on 31 January 2023.

3. Shop/Field Activities:

- Rural Field Supervisor Salt met with Miles from the Salt Lake Country Surveyors office on 2 January 2023 to provide access on areas west of the SLI Airport.
- Maintenance Supervisor Feragen met with Curtis from Kimball on 10 January 2023.
- Maintenance Supervisor Feragen, IT Specialist Dewsnap, and staff met with Dennis Craftin from Northstar HVAC on 11 January 2023.
- IT Specialist Dewsnap met with Wasatch Electric on 18 January 2023.
- Urban Field Supervisor Sorensen inspected and dropped off a check at Young Chevy for our new UAS vehicle on 20 January 2023.
- Maintenance Supervisor Feragen, IT Specialist Dewsnap, and staff met and worked with Shaun from Northstar HVAC on 25 January 2023.
- Maintenance Supervisor Feragen, IT Specialist Dewsnap, and staff met and worked with Dennis Craftin from Northstar HVAC on 26 January 2023.
- Education Specialist Rehbein conducted a safety meeting on 26 January 2023 on the spread of col/flu and managing stress in the workplace.
- Rural Field Supervisor Salt met with Luke from Young Powersports to sign paperwork for a new Honda SXS UTV on 31 January 2023.

4. **Field Data:**

Service Requests:

MOSQUITO SERVICE OPPORTUNITIES RECEIVED BY MONTH

	March	April	May	June	July	Aug.	Sept.	Oct.	Total
2023									
3-Year Avg.	3.33	10.00	30.00	41.33	29.00	25.33	17.33	26.67	183.00

5. **Weather:**

January's weather was warmer (by 2.1°) and wetter (by 1.28") than normal.

Temperature:

	Monthly Avg.	Normal	High	Low
December	33.0°	32.2°	55°	12 °
January	33.5°	31.4°	53°	9 °

<https://w2.weather.gov/climate/index.php?wfo=slc>

Precipitation:

	Total for Month	Normal	Most in 24 hours
December	2.39"	1.40"	0.42" on 11 th
January	2.71"	1.43"	0.89" on 1 st

<https://w2.weather.gov/climate/index.php?wfo=slc>

Great Salt Lake (elevation in feet above sea level):

	December 1	January 1	February 1
2021 & 2022	4,190.60	4,190.70	4,190.90
2022 & 2023	4,188.80	4,189.40	4,190.00

<https://waterdata.usgs.gov/monitoring-location/10010024/#parameterCode=62614&period=P7D>

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Goats and Soda

A box of 200 mosquitoes did the vaccinating in this malaria trial. That's not a joke!

September 21, 2022 · 4:59 PM ET



MAX BARNHART



Carolina Reid getting her blood drawn as part of a clinical trial for new experimental malaria vaccine based upon live malaria parasites.

Carolina Reid

One Seattle morning, Carolina Reid sat in a room with nine other volunteers, each waiting to take part in a clinical trial for a new, experimental malaria vaccine.

Reid's turn came. She put her arm over a cardboard box filled with 200 mosquitoes and covered with a mesh that keeps them in but still lets them bite. "Literally a Chinese food takeout container" is how she remembers it. A scientist then covered her arm with a black cloth, because mosquitoes like to bite at night.

Then the feeding frenzy began.

"My whole forearm swelled and blistered," says Reid. "My family was laughing, asking like, 'why are you subjecting yourself to this?'" And she didn't just do it once. She did it five times.

You may be thinking – this is a joke, right?



Reid's arm swelling after being bitten by 200 mosquitoes at once in order to be dosed with the experimental malaria vaccine.

Carolina Reid

But it's not. "We use the mosquitoes like they're 1,000 small flying syringes," explains University of Washington, Seattle physician and scientist Dr. Sean Murphy, lead author on a paper in *Science Translational Medicine* released on August 24 detailing the vaccine trials.

The insects deliver live malaria-causing *Plasmodium* parasites that have been genetically modified to not get people sick. The body still makes antibodies against the weakened parasite so it's prepared to fight the real thing.

To be clear, Murphy's not planning to use mosquitoes to vaccinate millions of people. Mosquitoes have been used to deliver malaria vaccines for clinical trials in the past, but it's not common.



Sean Murphy, lead author of a new malaria vaccine study, demonstrates how participants got their dose: by placing an arm over a mesh-covered container filled with 200 mosquitoes whose bites delivered genetically modified malaria parasites.

Annette M Seillie

He and his colleagues went this route because it is costly and time consuming to develop a formulation of a parasite that can be delivered with a needle. The parasites mature inside mosquitoes so at this proof of concept stage – as early stage trials are called – it makes sense to use them for delivery.

"They went old school with this one," says Dr. Kirsten Lyke, a physician and vaccine researcher at the University of Maryland School of Medicine who was not involved in the study. "All things old become new again."

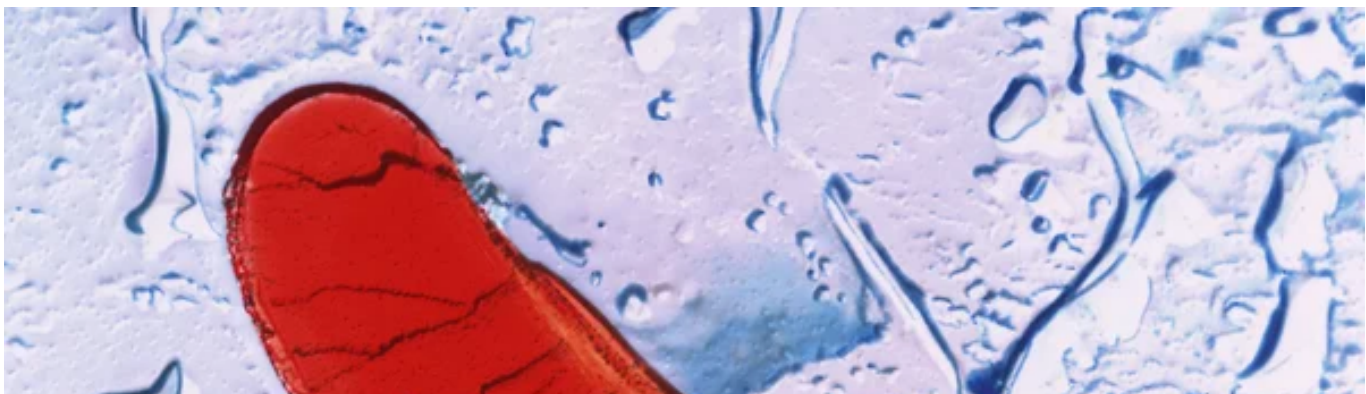
She calls the use of a genetically modified live parasite "a total game changer" for vaccine development.

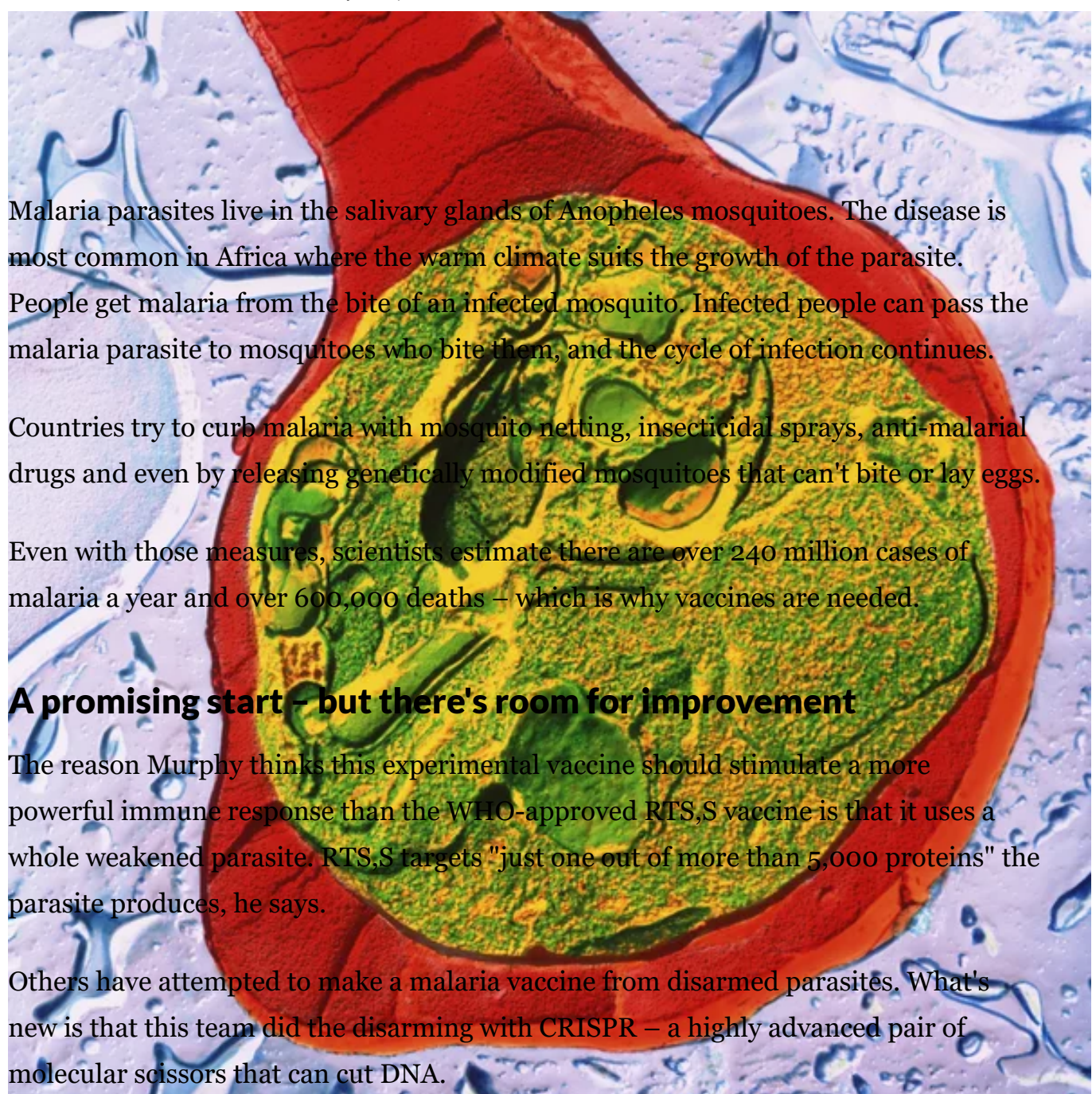
This type of vaccine is of course not yet ready for prime time. But the small trial of 26 participants did show that the modified parasites protected some participants from a malaria infection for a few months.

Murphy believes this approach could someday result in a vaccine that's substantially more effective than the world's first malaria vaccine, the RTS,S vaccine from drugmaker GlaxoSmithKline. The World Health Organization approved it last year, but it only has an efficacy rate of 30-40%.

Mosquitoes and malaria – a toxic relationship

Reid was looking for work when she joined the trial in 2018. "The first thing that caught my eye was the money," she says — a \$4,100 payment for participants. But when she spoke to friends who'd contracted malaria, she found a different motivation. She said it was no longer about the money at that point – though it was still nice – but instead being a part of important research.





Malaria parasites live in the salivary glands of Anopheles mosquitoes. The disease is most common in Africa where the warm climate suits the growth of the parasite. People get malaria from the bite of an infected mosquito. Infected people can pass the malaria parasite to mosquitoes who bite them, and the cycle of infection continues.

Countries try to curb malaria with mosquito netting, insecticidal sprays, anti-malarial drugs and even by releasing genetically modified mosquitoes that can't bite or lay eggs.

Even with those measures, scientists estimate there are over 240 million cases of malaria a year and over 600,000 deaths – which is why vaccines are needed.

A promising start – but there's room for improvement

The reason Murphy thinks this experimental vaccine should stimulate a more powerful immune response than the WHO-approved RTS,S vaccine is that it uses a whole weakened parasite. RTS,S targets "just one out of more than 5,000 proteins" the parasite produces, he says.

Others have attempted to make a malaria vaccine from disarmed parasites. What's new is that this team did the disarming with CRISPR – a highly advanced pair of molecular scissors that can cut DNA.

To test how well the approach worked, Reid and the other participants had to get another round of mosquito bites — this time containing the real malaria parasite.

Out of 14 participants who were exposed to malaria, seven of them — including Reid — came down with the disease, meaning the vaccine was only 50% effective. For the other seven, protection didn't last more than a few months.

"I actually cried when they told me I had malaria because I developed such a close relationship with the nurses," Reid says. She wanted to continue through the trials, but

her infection made her ineligible. She was given a drug to clear her case of malaria and sent home.

"We think we can obviously do better," says Stefan Kappe, an author of the study and parasitologist at University of Washington Seattle and Seattle Children's Research Institute. He and Murphy hope to improve the efficacy of their team's vaccine by putting it into syringes instead of using mosquitoes so they can get the dosage right. A higher initial dose could lead to greater protection for a longer period of time.

Lyke says some scientists think using a slightly more mature version of the parasite than the one in this vaccine could give the body more time to prepare an immune response. The team is already working on that approach, says Kappe.

If future trials are promising, there are other questions to ponder. For starters: How much would this type of vaccine cost? The scientists are partnering with a small company called Sanaria to produce the modified parasites. Kappe says that increasing production capability to scale up manufacturing will require investment.

As for Reid, her experience was so positive that she went on to participate in clinical trials for a bird flu vaccine and the Moderna COVID-19 vaccine. She says that she will continue to enroll in vaccine clinical trials "for the rest of my life actually."

vaccine trial malaria vaccine mosquitoes

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