

# How Duke's molecular diagnostics lab retains and trains

## Amy Carpenter

April 2024—Too few people, too much to do.

In that, Duke Health's molecular diagnostics laboratory is no different from any other laboratory. But competing for staff on the basis of money alone is out. "The reality is that in today's labor market, any molecular technologist can always find a job that pays more," says Barbara Anderson, PhD, MB(ASCP)<sup>CM</sup>, analytical specialist in Duke's molecular diagnostics laboratory, Division of Molecular Pathology, Genetics, and Genomics.

"We're in the Research Triangle. We compete against international pharma companies, large corporate commercial laboratories, and even more small startup companies. We can't compete effectively for an applicant or retain an employee if we rely on pay," Dr. Anderson told CAP TODAY after speaking last fall in a workforce session at the Association for Molecular Pathology meeting, where she and her co-presenter spoke about the overall staff shortage in molecular diagnostics and cytogenetics laboratories ("Survey probes staff shortage in genomics labs," <https://bit.ly/49Z1hyZ>).

"So we have to come up with ways to make the technologists feel like it's worth it to stay in our lab even though they can make more money somewhere else. And that's a tall order to fill," Dr. Anderson said, describing the plight of many laboratories. How she and colleagues retain and train is what she talked about, in that "upside-down" order, she said. "Because we can't train them if we don't have anyone to help us train, and the valuable people are the ones we have right now."

Underpinning most strategies is the laboratory's clinical ladder, which in some ways functions like a "circular spider web of activities," Dr. Anderson said. (More on that later.)

One of their main strategies for retaining people: assay "ownership" but shared responsibilities.

"Everybody knows you have lists of tasks—decontaminate the centrifuges, check the water in the eyewash stations, bleach and UV the PCR trays—every single one of those things is horrible and has to be done," Dr. Anderson said. The schedule for them rotates so duties change. "We parse them out equally."

"You don't have one person stuck scraping ice out of a freezer every time it has to be defrosted. And nobody is ready to quit over decontaminating PCR trays because you do it once or twice a year."

Dr. Anderson is often a go-between for MLS staff and directors, and the directors have good ideas—to which she often has to say no. "Because when you look at the logistics of what would be cool, it would also make them quit," Dr. Anderson said. Case in point: "Let's hire an entry-level person and just stick them in the extraction room and that's their job."

"No," she tells them, "they'll quit. If they have to do extractions every single day, they're not going to stay with us more than three months."

Everyone has their set of assays that they own and takes a turn in the extraction room. "There's no animosity about 'Why don't they have to do this?' Because extraction duty is terrible—we have so many assays, and a lot of them are manual extractions."

Once it leaves the extraction room, Dr. Anderson said, "our approach is, 'If this is your assay, it's your assay. You get the DNA after it's extracted, you set up the PCR, you run the analysis, draft the report in the LIS. It's your assay, you own it.'"

“Having ownership helps people feel like they have a place, a purpose.”

In bringing on new assays, she and colleagues look to see if it's an assay that has a shared software, instrument, or analytical method. “Once I can train somebody on one assay,” Dr. Anderson said, “if I have shared methodologies, then it's methods-based training, and I can get them to do several.” Asuragen, for example, has one analysis software for three separate assays—cystic fibrosis, spinal muscular atrophy, and fragile X. The training is smoother, and “the competency assessments become easier, too,” she said. “If it's methods-based, you don't have to watch them do every step of every assay.”



Dr. Anderson

The molecular pathology, genetics, and genomics clinical laboratory teaching and education committee provides continuing education sessions on such things as newly validated technologies. “We recently understood we needed to sit down and explain variants,” Dr. Anderson said, because the knowledge base was lacking.

Rotating fellows and residents are the presenters, as are MLS staff, and pathologists can dial in to see what new assays have been added. Fellows and residents also observe technologists running an assay, do the analysis, and draft the report. “It gives the technologists a sense of pride,” Dr. Anderson said, “and having them work one on one with the fellows and residents has been helpful for morale, for work culture.” They learn from the fellows and residents, too, “so their knowledge base is always getting deeper.”

## **The clinical ladder consists of four MLS levels: basic, advanced, senior, and specialist.**

“The process is long, it's arduous, it's meant to weed out the people who just want a promotion but don't want to do the work,” Dr. Anderson said. It involves leadership activities (leading a continuing education session counts), and for anything beyond the advanced level, a quality improvement project or presentation is required. Manager support and a recommendation to the clinical ladder review board, board approval, and three years of laboratory experience are required before a person can apply for the first rung of the clinical ladder.

If approved, the MLS is assigned a clinical ladder coach—someone who's done it and knows the process. Coaching is one of the leadership activities a person signs up for when they gain access to the ladder. “So being a clinical ladder coach is something that gets you promoted but also gets you involved in helping the newer people get their promotion. It's a circular spider web of activities,” as Dr. Anderson puts it.

“We don't just say, ‘Hey, clinical ladder, jump on board.’ And then everybody's at the top of the ladder, and it's falling over because there's no one at the bottom.” Approval for the new position is always a limitation.

Alternative work schedules, work culture improvement, and professional development opportunities are other retention boosters. The first of the three aids workflow. “Now we have coverage across much longer time periods in our lab, including Saturdays and Sundays, on a purely voluntary basis,” Dr. Anderson said of the varied schedules that some prefer.

Staff must write a proposal explaining how their desired schedule will improve their life and the laboratory's workflow. “You have to sell yourself: ‘This is what I want to do, this is why I think you should let me, and I think this is how it's going to profit everyone.’ And so far it's been phenomenal. Our ability to get work done has improved greatly,” she said. “Our mental health has also improved.” Four 10-hour days is an option, but the restriction is that no one can schedule four 10-hour shifts that result in a three-day weekend. “It's not fair,” because everyone

would want a three-day weekend. Allowing one staff member consistent three-day weekends, she said, “would kill work culture immediately.”

Four work culture improvement committees grew out of yearly survey results for all laboratories: diversity and belonging, performance and professional development, recognition, and recruitment and retention. Serving on one serves as a clinical ladder leadership opportunity. Professional development spans a range, from Duke courses to internal CE and soft skills training. Tuition reimbursement is one way, Dr. Anderson said, to “combat the ‘I can’t pay you any more’” problem.

## **The strategies for new employees are similar to the laboratory’s retention strategies.**

“They’re the receiving end of the clinical ladder as opposed to the giving end,” Dr. Anderson said. Duke’s molecular diagnostics and cytogenetics laboratories share a space, and initial competency training is integrated. “We need people to be able to do PCR and macrodissections,” or work in the extraction room “if the cytogenetics group can extract.” But it became clear quickly that basic skills training would have to be step one.

“This cross-training is cool,” Dr. Anderson told her manager, “but we have to take a step back and make sure everybody knows what they’re doing before we hand them a pipette. It’s not as intuitively obvious as we think it is.”

All new molecular and cytogenetics laboratory employees attend her workshop within their first two weeks on the job, “and it’s high school science lab all over again,” she said. There are no workshop exemptions. “I don’t care if they have 40 years of experience on their resume or they just walked out of college. They have to go through pipette and macrodissection tutorials and intensive extraction room training.”

“Everybody thinks the extraction room is just extracting, but if we mess it up at that point, we’re not even going to know we messed it up,” Dr. Anderson said. Cytogeneticists and all new employees in the molecular lab spend a lot of time in the extraction room before they’re allowed to do anything else. They begin with bone marrow engraftment analysis because mistakes can be caught before they leave the laboratory, she said, and because BME is not a limited sample.

A subject matter expert is assigned to work with the new employee when they first start to run an assay. “Before the reports go to a director they go to the subject matter expert,” who can catch mistakes and help resolve them, Dr. Anderson said, noting that expertise in any one of the assays is a clinical leadership activity. “A new employee responds a lot better to a fellow technologist than if a director says, ‘These results are wrong.’”

## **Duke has regularly hosted interns from National Accrediting Agency for Clinical Laboratory Sciences-accredited training programs at the University of Texas MD Anderson Cancer Center and the University of North Carolina, during which they shadow Duke’s technologists and are given a project to do, such as one in quality improvement.**

“It’s a three-month-long interview of this person who’s about to graduate,” and, if hired, comes in as MLS basic. “We already know their skill level, ability to learn, be taught, corrected, and take responsibility,” she said. “It’s a huge opportunity.”

The laboratory teaching and education committee helps new and other employees learn with live and recorded CE sessions. “Anyone in our lab is allowed to go to the manager at any point and say, ‘Is there any way I can start doing this assay? I think I can do it.’” The assay’s subject matter expert trains and assesses whether the employee is ready.

The CE sessions teach basic and advanced topics in preparation for the certification exam, and anyone who wants

to prepare can work with an assigned mentor, “to help the person get through,” Dr. Anderson said—yet another ladder opportunity for the mentor.

Duke’s hospitalwide career shadowing program gives any clinical laboratory employee two days each year to observe technologists in any other laboratory. “You think, ‘Molecular sounds fancy—I’m going to apply for that.’ And then you realize you don’t like it and want to work on automated instruments,” Dr. Anderson said. It’s a way for the person to learn what the laboratory does and for the laboratory to “see if this is a personality everyone can work with. I call it speed dating.” It need not be hospitalwide, she noted for others. “You can do it just in your lab.”

Duke’s clinical labs training program prepares biology and chemistry graduates to work in laboratories with basic instruction in laboratory technique. “Our biggest pool of new technologists is from people who majored in biology. If we can tap into that source and bring them through this training program, give them an opportunity in one of our labs,” and set them up to work and apply for certification, “many biologists would jump at the opportunity,” Dr. Anderson said. “We hire them with the caveat that they’re going to go to this training.”

All of what’s in place to retain and train has been a concerted effort spanning several years, Dr. Anderson tells CAP TODAY, “involving dozens, if not hundreds, of individuals in our labs who have volunteered to develop the clinical ladder, work on work culture committees, serve as mentors, as well as those in leadership who understood the vision and supported its development and growth.”

*Amy Carpenter is CAP TODAY senior editor.*