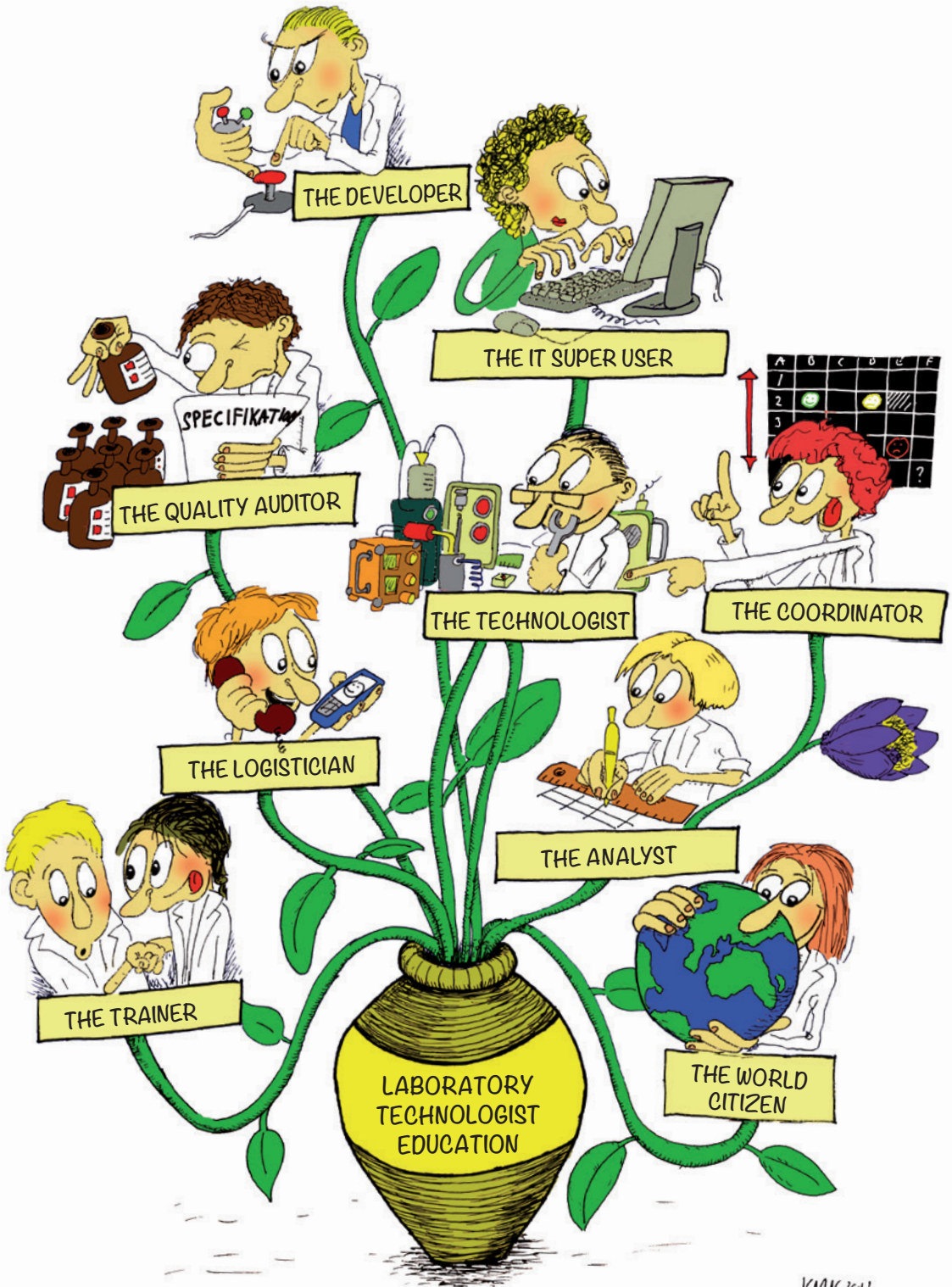


MEET 9 SPECIALISTS

– WHO ARE CREATING THE FUTURE



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A PROFESSION UNDERGOING CHANGE

In Dansk Laborant-Forening/HK (DL-F) we know that our profession contains a vast number of exciting job opportunities.

In this booklet you will find a description of the nine job profiles which Dansk Laborant-Forening/HK (DL-F) has forecast as being some of the job opportunities, we believe, our members will be the best to undertake.

The profession has always been in a process of development, and the future with its new challenges is waiting just around the corner – because at the present time development is moving fast within the field of laboratory science.

For our members it is all about daring to reach out for the new work disciplines.

It is all about seeing new ways to go – by building on your new skills – and making yourself attractive to the future laboratory scientific labor market.

The object of this booklet is to draw attention to all the skills our members have in relation to members and to employers.

The object is also to formulate the future of the profession and the continuing need for developing education and training courses within the area of Dansk Laborant-Forening/HK (DL-F).

And not least Dansk Laborant-Forening/HK (DL-F) would like to disseminate the message that our members are ready for the future – and that it is the right choice for future employees within the field of laboratory science in the workplaces.

If you would like to know what Dansk Laborant-Forening/HK (DL-F) thinks about the future of the profession, you are welcome to contact us.

Note: In this booklet the jobtitle "laboratory technologist" has been used. Dansk Laborant-Forening/HK is aware that other job titles are used, for example: "laboratory technician".



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THE ANALYST

GUARANTOR FOR CONSUMER SAFETY



Eva Jørgensen has been a laboratory technologist since 1989 and has worked at the Danish Veterinary and Food Administration's laboratory in Ringsted since 2006.

At that time, she was, together with the rest of her colleagues, moved to the laboratory in Ringsted. After 18 years of exclusively analyzing fruit and vegetables for pesticide residue she received the opportunity of changing working tasks.



– My daily work involves analyzing for the residue of veterinary medicines in different matrices. They are found in the intestines, muscles, urine and plasma from different types of animals using random checks. It is exciting work which I really like, says Eva Jørgensen.

– My job is important because I am part of a random checking system of our foodstuffs. That is where we find out whether they comply with the requirements laid down for what we can put in our mouths. It is a guarantee for consumers that what we eat is quite in order.

I have undertaken the same analyses for a number of years, and that is why I have the experience of how these analyses are to be carried out correctly. It is other colleagues who further disseminate the results I come up with. They are very dependent upon my reporting back that everything is as it should be. That is why the guidelines for analysis have to be followed to the letter, says Eva Jørgensen. There is also a lot of responsibility linked to her work. You must be able to depend on the results of the analysis, and you can only do that if the work has been carried out 100% according to the guidelines. That is why Eva Jørgensen has to be able to document everything she does in detail. This means that she notes everything down in order to obtain quality assurance for the work undertaken, but she thinks that is interesting as well.

I am also the person who can come up with a suggestion that the work process could be changed. Other persons who have no labora-



“ My job is important because I am part of a random checking system of our foodstuffs

tory experience can propose many changes, which in practice cannot be undertaken in a laboratory. That is where I can, with my daily practical experience, come up with a suggestion regarding changes; you get worthwhile experience from other analyses, says Eva Jørgensen.

The best thing about her job is that it is diversified as well as being interesting. She spends a lot of time purifying the samples in the laboratory. In the Danish Veterinary and Food Administration they work in that way that the employee

who initiates the test is also the one who finally finds and disseminates the results.

I am also involved with the calculating part where you gain experience with technical instruments. I use a HPLC-MS which is specialized equipment. It is nice and satisfying that you analyze as well as find results.

I think my job is diversified and interesting as well as being meaningful. And at the end of the day I can go home happy because I feel that I have not been wasting my time, says Eva Jørgensen. ■

THE QUALITY AUDITOR

ENSURES THAT QUALITY IS OF THE HIGHEST ORDER



When laboratory technologist, Susanne Jeppesen, is doing her job at Novo Nordisk A/S in Bagsværd it is done for the most part at a desk and in front of a computer screen. With 36 years of laboratory experience she has chosen to put work in the laboratory behind her. Instead her job is now to check that her colleagues comply with GLP – Good Laboratory Practice.

Susanne Jeppesen is a quality auditor along with seven others in the GLP QA department at Novo Nordisk A/S. It is Susanne and her seven colleagues who ensure that the quality of the GLP trials which are undertaken at Novo Nordisk A/S meet the requirements in force.

– Our most important task is to ensure that quality is of the highest order, so that in the end the patient gets the best medicine. That is the banner headline for our work, says Susanne Jeppesen.

– In our daily work we can sometimes be regarded as a kind of policeman who is looking over your shoulder. Because we do go checking that things are being undertaken as they should be. Our most exclusive task is just this, that if there are errors and shortcomings, then we find them. It is the way we try to ensure that quality is of the highest order, that everything meets the different regulations, says Susanne Jeppesen.

Laboratory Technologist since 1980

She has been a laboratory technologist since 1980, for the most part in different microbiological laboratories. In 2008 she chose to drop the work in the laboratory for work at a desk, where she spends more than 80% of her work-

ing time. The rest of the time is spent monitoring and checking in the laboratories. She chose to move to quality auditor work because she thought she needed new challenges.

– It can become a little humdrum in the long run working in a laboratory. Work as a quality auditor is very varied and independent. We have a big responsibility and a very stimulating job. In the process we must make many decisions and take a position on different issues, which we get from internal customers we have in the company. There is also the advantage with the job that you become good at English because the vast part of our work takes place in that language. All the material we look through is in English. Outwardly we have also got many contacts because we visit many departments and examine different analyses, she says.

When you start in the GLP QA department you have to attend a range of internal and external courses. Susanne Jeppesen was amongst other places sent to England to attend some GLP courses. We don't have many courses like that in Denmark.

The work is like this

Novo Nordisk A/S is continually running a large number of pre-clinical trials and GLP QA checks that the trials meet the requirements for Good Laboratory Practice. Tests are carried out on mice and rats, and all the trials are necessary before the medicine is tested on human beings. It is these trials that Susanne Jeppesen and her colleagues are examining and checking whether the regulations have been complied with.

Prior to each separate GLP study a study plan is drawn up by a so-called quality control coordinator.

Often it is about analyzing blood samples from mice and rats which have been tested primarily for insulin preparations. The GLP QA also checks that the laboratories meet the Danish authorities' requirements (Danish Medicines Agency) and comply with OECD regulations. The OECD requirements are a European code of practice, which have been directly drawn up with a view to GLP work.

Checking raw data

– When the trials have been concluded in the laboratory, a report is produced in English. During the trial a lot of data has been generated. This data is raw data which the laboratory technologists have noted down during the trial in the laboratory. This raw data is collected in a file which is received by the department. We then look through this data and it is a large part of my daily work to check whether the trials meet the requirements and that all the papers have been filled out which they have to be according to good documentation practice. Finally, I complete my work by drawing up an audit report which describes whether everything is in order, or whether there are perhaps some errors or shortcomings which will have to be corrected.

The report is then sent to a quality control coordinator/or occasionally to an outside quality control coordinator, and he/she corrects the errors if there are any, says Susanne Jeppesen. ■

“ The work as a quality auditor is very varied and independent



BRIDGE-BUILDER BETWEEN RESEARCH AND IT DEVELOPMENT



Since Mads Molich completed his education as a laboratory technologist in 2006, he has for the most part not had two working days that are the same. Today he works at Novozymes A/S in Bagsværd as a "scientific laboratory technologist" or as it is known officially: Associate Scientist.

Originally, he was employed in an ordinary laboratory technologist position after his practical training in Novozymes A/S, but very quickly his interest and ability in IT took over. Since then his job has all the time developed together with new challenges, so that today he functions as an intermediate link or "interpreter" between advanced IT developers and research workers in laboratories.

– I have never looked for another position, and yet today I am in another place entirely. I thrive on continuous changes, and I hate it when things are standing still, he says.

Positive bosses

It started with new equipment in the department. Advanced software was to be installed and Mads Molich threw himself over the task. And it gained momentum, so that he ended up being a super user. Since then he has attended different IT courses because his bosses are aware that Mads' abilities are a plus for the company.

– They understand that I really like the dynamics of development, and that I would soon be bored if something new did not happen. So, they have encouraged me to continue along the path I want

to go. Today I spend my time between research and the IT department, where I work with the in-company employees as well as the external consultants. I am also present when new equipment is being installed in the laboratories and software is being run in, says Mads Molich.

The best of both worlds

He enjoys the best of both worlds and understands the language of both worlds. Therefore, he can disseminate the often difficult presentation of problems and questions which research workers as well as IT experts have for one another and represent the laboratory technologists in relation to the IT developers.

– Of course, there are people in research who do not know a thing about IT, but they just expect it to function. And today IT is a central part of laboratory work where much of the equipment demands advanced software to function optimally. Here I can be of help by asking the right questions to the IT experts, emphasizes Mads Molich, who often with his expert knowledge can help solve problems before they arise.

His interest in IT has not come out of the blue. His father is an IT consultant, so something has rubbed off from home, whilst over the years he has acquired a lot of his own accord. But even if he had not had this special interest, and had worked as an ordinary laboratory technologist he would have become acquainted with IT to a great extent anyway.

– Laboratory work has moved on a lot over the last ten years, and there is more and more com-

puter-related work in the profession. My colleagues also spend some time in front of the screen, and that is why I am happy that I can help optimizing results and understanding the new developments that are taking place. It benefits the company and we get the most out of the expensive equipment, says Mads Molich.

IT is driving research forward

He is completely convinced that it is the ground work in the laboratories which is creating research results and new products. But it is an interplay because technology means that research can move forward more rapidly and

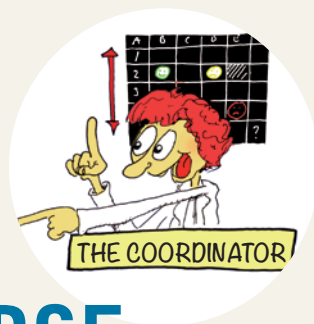
perhaps create a head start to the competitors. – I feel that it's what I am doing when I spar with my colleagues in the laboratories as well as in IT development. Novozymes A/S is a big company with many specialists, and this means that there is a large pool of colleagues with whom I can share knowledge and experience. We can all learn from one another, and therefore, it is so satisfying to be the link which can create greater understanding between the different professional fields, emphasizes Mads Molich, who enjoys his job and could not dream of anything other than a job in continuous development and change. ■

“ There is more and more computer-related work in the profession



THE COORDINATOR

FLAIR FOR ORGANISING AND GATHERING KNOWLEDGE



As a working environment and emergency and security coordinator Henriette Lerche no longer works in the laboratory. Her workplace is the long corridors and offices at the Niels Bohr Institute at Copenhagen University on Blegdamsvej in Copenhagen. Since the autumn of 2012 she has worked full-time in the institute's administration.

Henriette Lerche started as a laboratory technologist at the Niels Bohr Institute and was then employed in a research department at the same place. She was there for four years where she became a part of the working environment organization and was elected employee representative. Management chose to abolish her position and offered her instead a position where she would be working full-time with the working environment, which she already knew something about.

– I have also been a shop steward, so the management had already seen that side of me. It is important in my job to have integrity and to remain objective at all times. I am neither on management nor the employees' side. My function is to create a bridge to get things to play along together.

The management was of the opinion that I, as shop steward, could manage this. And I have had the position of working environment coordinator since the autumn of 2012, says Henriette Lerche.

She believes the best thing about the job is that she is an integral part of the many processes. The management or the working environment

organization often have an idea that they want something being investigated.

Has influence

– My function is to collect and find the necessary information, which I present to them. We then find out together how the plans can be realized. And often I am also involved in putting them into practice. My work also has something to do with influence. Management can be in doubt about how something has to be managed. Then I can come along with input and tell them how I think we shall proceed. Here I draw on my long experience. I have a greater insight as to how things function practically in a laboratory if you want to make changes. The management do not have the same insight. Then I can come along with my proposals, so that in some areas I am my colleagues' representative in relation to change, says Henriette Lerche.

Her skills as a working environment coordinator are first and foremost organizational flair and a sense of where she can find the necessary knowledge. But also, an ability to get these things linked to the visions and strategies of the organization.

Intricate executive orders

– We would all like to see our employees healthy and well. But at the same time, I also know that we cannot just decide what people are to do, whether they have to go on a diet or something. It's more about communicating health related issues.

At other times it can be an intricate executive order in the legislation I have had a look at. It can be written in a nonsensical language and it is necessary to translate it, so I work with it until it is meaningful, says Henriette Lerche. She is also a security and emergency coordinator. In this job she is responsible for coordinating the Niels Bohr Institute's emergency response at the workplace in case of accidents or something as extreme as a school shooting. At the present time the institute is in the process of getting a new building in which the employees will be moving to in a year's time. There Henriette Lerche will via her coordinator's role in some of the working groups come with input regarding the working environment. What do you have to take into consideration about the working environment when you are building something new? It is also her work to ensure a good working environment and, in this way, stamp a mark on the new building.

The framework for performance

Henriette Lerche's job is important because the working environment is what creates a framework for what one can undertake at the workplace.

– I believe that in my coordinating role I have a different overview in relation to the working environment representative. I am a little more in the forefront and plan working environment meetings together with management and draw up agendas. In my case my leader leans on me quite a lot because he has not so much time and resources for this work even though he would like to. So, in this way I have rather a lot of influence and I believe it is a good thing for the workplace. It often happens that my leader openly admits that there are things he does not know. But then we sort it out. For myself it is all about having a network, so I have people I can discuss things with. Especially psychological working environment problems can be very complex and difficult. Many in management can be afraid of them because they can sud-

denly become very personal. That is why we have got somebody like me, who without the employer's prerogative can go in and investigate and look on things with fresh eyes as to how we can solve the problem and move on, says Henriette Lerche.

She emphasises that her task is to move the workplace forward and help make it better all the time. ■



THE LOGISTICIAN

SAY WHAT YOU NEED – AND I'LL GET HOLD OF IT



Laboratory technologist Heidi Irmig is a buyer at DTU Biosustain, Novo Nordisk Foundation Center for Biosustainability (CFB) in Hørsholm. She has recently been extremely busy in connection with the moving of DTU Biosustain to a completely new biotechnology tower block at DTU Lyngby Campus. Heidi Irmig is one of the key persons who has to control the logistics in connection with the move as well as with the busy everyday research environment.

There are more than 220 employees in the building she works in. Of these 200 work in the laboratories and it is these 200 research workers, laboratory technologists and assistants she has to service.

– Now we are going to move, so a lot of new equipment will have to be bought. At the moment I am going around asking the employees what they need, and which brands they prefer. As I am a laboratory technologist I know what is good and what is bad. But I would rather not decide on my own. They have, of course, to have some influence on what we buy, so we discuss it. In this way I have a large number of contacts. Colleagues can also ask for help finding a certain plate. Then I help them with that, if they are looking for a product, and they do not quite know what they want, says Heidi Irmig. More than half of the employees in her department are foreigners who do not know the Danish suppliers. She helps them to find out what they need, and then they are informed that Danish suppliers are given preference.

A variety of tasks

The best thing about her work is that there are a variety of tasks.

– It is good fun. And perhaps I am something of a trouble-shooter. I get the infrastructure to function. And then I like the fact that there are many different cultures and people. I like the research environment with research workers and young people. Given that I am a buyer at a place like this I still use my laboratory technologist's education, and it is nice that I have not left it completely, she says.

She has worked in research and quality control QC for 16 years. Furthermore she has worked for five years as a sales coordinator in a company which sold chemicals, reagents and equipment. That meant that she had as her area of activity: purchasing, sales and logistics. As a logistician she ran the stockroom and packing and forwarding department. And now she has been three years in a newly established position at DTU Biosustain.

Considerable time spent

– Previously it was the laboratory technologist who had to order everything. But management could see that far too much time was spent doing this. So, it was agreed to bring together and coordinate purchasing. Now I work with purchasing of chemicals, laboratory articles and equipment. And I am also responsible for packets coming into the building, being opened and the goods put into place. Either the users

have to have their goods straight away, or they are placed in the stockroom. I am also responsible for the stockroom.

It is a joint stockroom with all kinds of plastic and glass articles. The users just go down into the basement and fetch ordinary goods. I am responsible for the shelves being filled, says Heidi Irmig.

She thinks it is a good idea that purchasing at the institute has been brought together and coordinated because it saves money. She has close contact with the suppliers; they are on good terms and she gets better prices because the purchases can be collected together in bulk. DTU makes a tender round every now and again. You have, of course, to adhere to the tender, but sometimes you are able, to obtain better prices even though you adhere to the tender.

Explosives stopped

Being placed in a central position she has in DTU Biosustain a good idea of what is going on in the building. She can keep an eye on what chemicals and equipment are arriving at the building. She had an experience where somebody wanted to purchase explosives.

– If they had been responsible for the purchase they could have been delivered to the building. But because the order lands on my desk, I can ask the user whether he is sure about the purchase in question. In such a case there are

“ I might also be a bit of a problem cracker and make the infrastructure work



things which you have to be in control of prior to the purchase. Often, they do not use the material anyway. Sometimes you can stop some things or at least ensure that some rules have to be made first, says Heidi Irmig.

She has a budget which has to be kept to, but she is not responsible for the budget. So, she has not got the green light to buy whatever she wants. But she knows what the budget is, and she receives a statement monthly, so she can see whether she is within the scope of the budget. The research workers have their own budgets which they control themselves, so Heidi Irmig is solely responsible for joint purchasing. If she buys expensive equipment, her boss and somebody from the financial department have to approve the purchase.

Equipment database

At the present time she is in the process of establishing an equipment database where all information about the equipment has been installed. If something breaks down, Heidi Irmig is informed, and then she looks at the equipment database and finds out what kind of service is needed. So, she makes sure that things are repaired.

– We make use of some purchasing and financial software. I have got a software where the users can place their orders. For them it is an ordering software and they can use that instead of sending me an email. I can see that we perhaps have to have five goods from the same supplier, so I make an order by copying the orders over into DTU's e-commerce software. It is a purchasing software which we use for purchasing. I am a super user in the software and help others if they have problems with it. Apart from that I have a student to assist me with different things in the stockroom and with packages. Apart from this Heidi Irmig is a shop steward and in relation to this she is interested in having a good working environment physically as well as mentally. Previously she was a working environment representative and she devotes a lot of attention to ensuring safety and the working environment are of the highest order, so she also uses her job for this when she goes around the workplace. ■

THE TRAINER

THE LABORATORY TECHNOLOGIST TEACHES THE DOCTORS OF THE FUTURE



Thousands of young medical students have over the years become acquainted with Helle Dyhrfeld Jensen's professional guidance in the laboratories of the Panum Institute in Copenhagen. Helle is employed as a practical training laboratory technologist, and her task is to guide the students through different practical training exercises in the laboratories. A task which requires good pedagogical and communication skills.

– My job together with that of my colleagues is to ensure that the students – who are otherwise on a very intensive and theoretical course of study – come to experience “hands-on” tuition, which supports the theoretical tuition. We guide them in how we execute different tests on tissue samples, so that they gain an understanding of how it is undertaken in practice. They also become acquainted with equipment which they will very likely meet in their daily working life in the future, says Helle Dyhrfeld Jensen.

The environment was a draw

It was not on the cards that Helle would be a trainer when after completing high school she had to decide on her future. She wanted to work with the environment and as she did not find an academic career attractive, she thought of herself as a coming environmental engineer. First the requirement was a laboratory technologist education, so she took it. Afterwards I went travelling and then got a job as a laboratory technologist. Then I had a child and went

on a laboratory engineer education where there were greater opportunities for an exciting job, says Helle; after completing her training and education she had several jobs in the private as well as the public sector.

An opportunity arose to obtain a position as a practical training laboratory technologist at the then Pharmaceutical College, later to become a part of the University of Copenhagen, and later again Helle was attached to the Faculty of Health and Medical Sciences at the University of Copenhagen as a practical training laboratory technologist, where today she is also a shop steward for 90 laboratory technologists at the Faculty.

Important with practical experience

– We are two colleagues who run these courses for especially 4th term students. We prepare the tissue samples for the students and provide the set-up, e.g. tissue from ordinary rats and tissue from rats with diabetes, on which the students have to carry out different spectrophotometric measurements. Here they learn that it is not always necessary with long formulas and theoretical explanations, but you can go a long way with ordinary simple arithmetic in laboratory trials, and at the same time they gain practical experience, says Helle. The students also learn about safety and the working environment in a laboratory, and how “good laboratory practice” is necessary to ensure a professional workflow.



“ The best thing about the job is to see the practical training exercises succeeding and to experience the pleasure of carrying out a successful trial

Great satisfaction

– We have to guide them in the practical work, but gradually we have also got an understanding of the theory behind the trials, so we can supervise around most of the points. There is great satisfaction when the students, who are in a very competitive, academic environment, get an aha moment at the laboratory tables, says Helle Dyhrfeld Jensen. She admits that not all laboratory technologists are good at facilitating and tuition, and from the start she had not seen herself as a “tutor”.

– But I discovered it was good fun and I liked doing it. I have also been on psychology and communication courses – subjects which are of benefit to me when teaching as well as being a shop steward, says Helle.

The best part is when the students succeed

She and her colleagues have the ambition that the students should have the best tuition which it is possible to deliver, and here they also have a role to play. The practical training laboratory technologists feel they are responsible for the students having a positive experience and learning something during their visits to the

laboratories, and that they experience that people other than their professors can have a high standard of professionalism and pride in their work.

– The best thing about the job is seeing that the practical exercises can succeed and experiencing the pleasure of executing a successful trial. It means a lot that my colleagues as well as myself get a good assessment of our courses, even though some of the students are at first a little reticent, and do not quite understand why they should “waste time” with laboratory work when they could be spending time on theoretical work. But they have also got to work alongside colleagues, and not the least with patients, and consequently it is important that they can function at a workplace and have good, social manners. I think we can give them an insight into this, emphasizes Helle Dyhrfeld Jensen.

The practical exercises in the laboratories take place with 24 students at a time. They are divided up into groups of two and there are two trainers and a practical training laboratory technologists at hand during the practical exercises, so there is time to guide each individual student as much as possible. ■

THE DEVELOPER

I LEARN SOMETHING NEW EVERY DAY



Lene Odgaard Kamstrup is a laboratory technologist with the Danish-American company CMC Biologics A/S, CMC, in Søborg. The biotechnology company is a customer-based company. This means that they have many different customers which they undertake development for, e.g. purification processes which afterwards are transferred to the production.



– At CMC we work with developing biopharmaceutical production processes together with GMP (Good Manufacturing Practice) of biopharmaceutical proteins in clinical trials as well as marketing. As we are a contract manufacturing organization a high level of service in relation to our clients takes pride of place, relates Lene Odgaard Kanstrup.

Sometimes a customer has developed a process which has to be transferred to CMC's production.

– Our role in my department is to find out whether the process can be wholly transferred to our production, or whether there are some things which have to be modified a little. We have also customers where we have to develop the process from scratch. The process is then placed into our production on a large scale, so the customer gets a completely purified product, explains Lene Odgaard Kanstrup.

Independent work

Lene's work is very independent, and for the most part she plans her working day. If the company receives a completely new product, which has to be purified and the customer has not got a process, then Lene Odgaard Kanstrup starts by testing different purification resins. It can be those which the company usually uses, but sometimes she tests completely new resins to see whether they can be used. It can be different buffer systems which are tested and used in the purification.

Sometimes we run TFF membrane filtration and reconcentration, where we test pressure, speed and use different buffer systems so we

can see how the buffer system matches this product and the purity of the product.

– There is a lot of laboratory work in what I do and the more experience and knowledge you have, the further into the process you can progress. If I want to I can come with an initial draft and ideas. It is truly interesting, but takes place in collaboration with others, says Lene Odgaard Kanstrup. In her work the emphasis is on practicality. What she amongst other things likes is that the more theoretical knowledge and background insight she has, the more influence she has on her work.

Lene has a diploma degree as well

Lene completed her education 20 years ago and has also a diploma degree specializing in biotechnology at the University of Southern Denmark.

– During the 20 years I have gained experience as well as knowledge. I am in possession of quite ordinary inquisitiveness and interest. On this basis it has not been necessary for me to obtain a diploma degree to realize myself. But it has given me greater self-confidence to be able to show that I could get a degree along with full-time work and having small children.

– With a diploma degree in my back pocket I feel I can give myself more professional challenges. I moved from Novozymes A/S to CMC Biologics A/S which is a smaller workplace. It might well be that it is easier to be able to try things out in a smaller workplace than in a larger one. This degree is a good tool box to have. With it I know more about in which databases I can find knowledge. And consequently, there are several things at work which I, as a developer, can do automatically. It is quite natural for me to use what I have learnt in my work, says Lene Odgaard Kanstrup.

She thinks her job is important for her because she is well able to progress in her present position.

– I feel as though I learn something new every day I go to work. That is what I like, she says. ■



“ I'm equipped with quite a bit of curiosity

THE TECHNOLOGIST

FROM ALARM CLOCKS TO ROBOTS



Inge Lise Stripp Petersen has always enjoyed technology, IT and programming. Since she was little she has taken everything apart from alarm clocks to sewing machines. Today she is a laboratory technologist at Novo Nordisk A/S in the API Bio Analysis department. Here she has been privy to implementing robot technology, likewise she is responsible for data and software and the ELISA readers which are used in her department.

– I think it is fun knowing how things are constructed, then I can better understand what is going on and can better find faults if there is a problem. My approach to technology is perhaps a little special. Where some people take a step backwards and get flustered about something which does not function as it should, I am a little stubborn by nature because I really want to know why it is not working, and what has to be done to make it working again, says Inge Lise Stripp Petersen.

ELISA is an abbreviation of "enzyme-linked immunosorbent assay", and it is the technology which robots have taken over in API Bio Analysis, not the least with regard to the health of the laboratory technologists. The robots place some protein and antibodies in different combinations in 96 well plates. It results in an enzyme reaction which can be measured in a spectrometer. It is very hard on the arms to do the work manually, and that is why robots were given priority.

Gathering dust

– We had some robots which stood gathering dust, and nobody was using them because they

were too slow compared to the laboratory technologists.

We had a manager who knew something about robots and realized that they could not be implemented in an off-hand manner. And he was really good. He gave three employees the time to provide this implementation, sent them on a course in Switzerland and prioritized the time necessary. It is partly due to his credit that robots have now been implemented and we use them for almost everything. It is important with support from the management and without them it is almost impossible. It requires that there is a manager who has seen the light and who says he would like to use resources to get robots to take over that part of the work which is destroying the health of the laboratory technologists who are undertaking repetitive work causing RSI, says Inge Lise Stripp Petersen.

Barriers and fear

She would like to break down the barriers and fear which some people have for automatization.

– It requires courage and it demands resources if you are going to do something other than what you usually do. The equipment is complex, and you have to believe that what you are requesting the robot to do will also be what it does. So, you have to have faith in technology. There are often some barriers there. At the start you check a lot to see whether the robot is doing it right. And of course, you have to do that. We are GMP regulated and subject to the Food & Drug Administration's regulations. So, it is a bit difficult to take in something new. It can take up



“ I think it is fun to know how things are constructed, because then I can better understand what is going on

to a year to implement a robot, because there are many regulations which have to be complied with. And of course, we have to be completely sure that we can rely on what we deliver. It could be an expensive affair for a company if what you deliver is wrong. It is far better to have a belt and braces approach. Because it can be very expensive to make a mistake, says Inge Lise Stripp Petersen. She is very happy and proud that the department – as regards GMP as well as robots – is a model for the rest of Novo Nordisk A/S. The department's team leader, who has just changed jobs, has used every occasion to tell the outside world how well the implementation of robots has been undertaken. Now the laboratory technologists are free of injuries and moreover they now have gymnastics as a part of their working day.

Completely clean

The work in Inge Lise Stripp Petersen's department lies between basic research and production. The department's primary objective is to verify that medicines are completely unadul-

terated and without impurities which could cause problems for patients.

– We are really important because we verify that medicines are completely pure, and that the safety of patients is of the highest order. If at the same time we can see to it that the laboratory technologists do not fall ill, because purely on technical grounds we can be a model for others and show that we can use robots, then it is just great, says Inge Lise Stripp Petersen. The company's control laboratory in Kalundborg has been so inspired by the success of API Bio Analysis that they have also recently begun to use robots there.

– It is a huge victory for us, says Inge Lise Stripp Petersen, who urges colleagues to go to their bosses if they experience that things can be done in a smarter way.

– It does not do any harm to say to the boss that you have seen somewhere else that they have an industrial autoclave, an electronic pipette or something else. Couldn't we try to get something like that in our department. It could be that the boss says "no", but if you do not ask, then you will never be given permission. ■

THE WORLD CITIZEN

ALL-ROUND JOB WITH AN INTERNATIONAL PROFILE



Weekly Skype meetings with Indian engineers, visits to factories in Germany, France and India, courses in England and meetings with Japanese customers. These are some of the experiences Kirsten Ravn Larsen has had since she joined the development department at Roulands Braking ApS in Odense in 2014.

It is not a completely normal laboratory job Kirsten Larsen does. Roulands Braking ApS makes brake blocks and brake linings for saloon cars, lorries and is part of a global concern with factories in India, France, Germany and China. Roulands' HQ is in Odense where research, development and quality is placed, whilst production takes place in three Indian factories. Apart from this there is a Research & Development department in Poland and assembly plants in China and France.

– It is a very atypical laboratory job. I draw up specifications for raw materials and support industrial chemists in their work in creating new “recipes” for products. It is work which demands a good knowledge of the testing methods in a laboratory, together with experience in examining and evaluating the differences between the test and the materials, says Kirsten.

Experience and further training and education

She was trained back in 1984 and attended the first laboratory class at Dalum Technical College. After a couple of years at the Dairy Industry's Central Laboratory in Hjallesø, she moved to Dalum Paper Factory where she was for 26 years until the factory closed in 2012. At Dalum

Paper Factory she had continuously undertaken further training and education; e.g. bachelor in operations and production planning, bachelor in commerce, accountancy courses and after closure she had the opportunity of taking a 6 week course in Systems Applications and Products in Data Processing (SAP). After a couple of short-term employments, she was in March 2014 rung up by Roulands Braking ApS who had seen her job profile on Jobnet.

– They wanted to employ me in a position which an American academic had had. It was a completely new world for me to come to a company producing brake parts. But at Dalum I had also been used to working with untraditional tasks, so it suited me fine. My tasks at Roulands is amongst other things to register, procure data sheets and draft technical specifications for those raw materials which are used in production. In the very nature of things very high demands are made on safety as they are used in a vehicle's braking system where it could be a matter of life and death, emphasises Kirsten Ravn Larsen.

Lots of international tasks

Today some of the raw materials come from India where the brake parts are also manufactured. It could be mineral powders and fibers where samples are sent from India to Denmark to be controlled and assessed whether they are suitable to be part of the production. Kirsten makes sure that the raw material samples are tested physically in Rouland's own laboratories whilst some are also sent to be controlled in



outside laboratories for their chemical content. In the pilot department prototypes of brakes are produced, which apart from tests in the laboratory and on dynamometers, are tested by test drivers before they go into production.

All this is managed from Denmark where 23 employees in the development department quite naturally have a lot of communication with the Indian manufacturers.

– I participate in weekly Skype meetings with the Indian and Polish development departments and have also visited the Indian factories and colleagues along with my Quality Manager in September 2016. Here we had a meeting with a Japanese customer and experienced the very special Japanese ceremony of exchanging business cards. I have also visited our French and German sister companies and participated in two global development meetings in Odense and Germany respectively with our owner, Steve Wang, and R&D participants from the EU, USA and India. There were 25 participants and I was the only woman, says Kirsten, who also in her daily work uses English in that her immediate

I participate in weekly Skype meetings with the Indian and Polish development departments

colleagues are Polish, and her manager is from England.

All-round job

Another of her tasks is to guide the Indian employees in taking samples correctly, so that they give a true picture of the material. And the measurement data from India forms the basis for the “recipes” in the mixtures which constitute the raw material, when the brake parts are manufactured. Kirsten also functions as an internal quality auditor in the company, and she takes part in meetings with the raw material suppliers. She has benefitted a great deal when participating in HK's lectures on international communication and cultural understanding. Apart from this she also acts as interpreter in relation to Danish colleagues who do not speak English and assists her Polish and Indian colleagues who are working in Denmark when they need help with translation and understanding of practical matters, e.g. communication via the internet to the Danish authorities, doctors etc.

China is the next step

Rouland is in the process of building a new factory in China, where as in India they hope to be able to make use of the local raw materials. And Kirsten hopes that she will also be able to play an active role here – and hopefully visit the factory and meet her Chinese colleagues.

– For the sake of my foreign colleagues I have the title “chemist”. Originally, I am a laboratory technologist, but if you translate it directly the position is regarded as being low in the hierarchy, and consequently you do not get any respect. But my position requires that I work with industrial chemists and engineers, and therefore I have to be on the same level as them, emphasises Kirsten, who aims on having many exciting years with international contacts. ■

WORTH KNOWING ABOUT THE GENERAL EDUCATION SYSTEM

In Dansk Laborant-Forening/HK(DL-F) we are working on creating a transparent way through the education system. It can be in relation to members, employers as well as the political system.

This is the general education system

The laboratory technologist' as well as the environmental technologists' education and training are so-called short-cycle higher education programmes.

The laboratory technologist' education programme (Academy Profession Graduate in Chemical and Biotechnical Science) is of 2½ years duration where 1½ years takes place in college and is based on a State Educational Grant and Loan Scheme - afterwards there is 1 year of paid practical training.

The environmental technologist education (Academy Profession Graduate in Environmental Technology) is of a 2-year duration and is

based wholly on a State Educational Grant and Loan Scheme.

A Bachelor of Chemical and biotechnical technology and food technology can be chosen as a superstructure to the laboratory technologist' education. The education programme is of 1½ years' duration and is based on a State Educational Grant and Loan Scheme and is a medium-cycle higher education programme.

Or you can choose a diploma degree in biotechnology, process technology and chemistry. The education is paid by the user and can be taken whilst one is working.

Finally, there is also the opportunity of taking graduate and master's degrees.

Dansk Laborant-Forening/HK (DL-F) recommends that you make enquiries at the study centers in order to hear more about the opportunities for constructing a programme in relation to graduate and masters' level.

Youth education/training	KVU	MVU
General upper secondary education or relevant EUD	Laboratory Technologist (2½ years)	Bachelor's degree (1½ years of full time study)
		Or
		Graduate education (3 years of part-time study)
Youth education/training	KVU	
High school or relevant EUD	Environmental technologist (2 years of full time study)	

EUD: Vocational upper secondary education
KVU: Short-cycle higher education
MVU: Medium-cycle higher education

WORTH KNOWING ABOUT FURTHER EDUCATION & TRAINING

In Dansk Laborant-Forening/HK (DL-F) we are working for our members getting the best opportunities to develop their skills through the whole of their working lives – in collaboration with their employers and according to their own wishes.

This is how to use the further education and training system

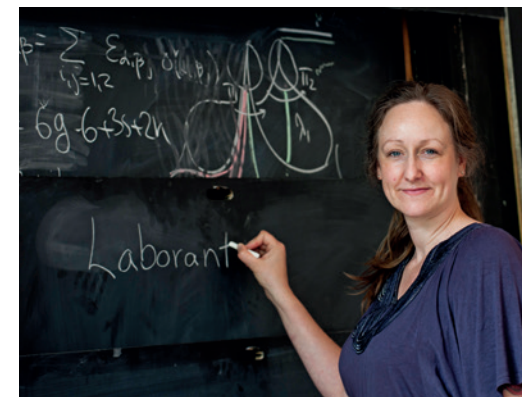
As an employee within the laboratory science labour market it is important that you keep abreast of development.

Therefore, Dansk Laborant-Forening/HK (DL-F) recommends that annually employees and employers discuss the needs and wishes for the development of skills for the individual employee.

There is a wealth of course providers which can be private or public.

As a member of Dansk Laborant-Forening/HK (DL-F) you have the possibility of getting a career adviser, thus being able to find your way to the right course.

If your workplace is covered by a collective agreement, there is a possibility of applying for funding for skills development via the collective agreement's education fund/skills development fund.



Dansk Laborant-Forening/HK (DL-F) also arranges courses for members, which are often free of charge, whilst the employer in some cases is expected to pay for time off.

Finally, you can choose to pay for your courses – you could attend an evening class course or participate on an online course at home in the evening.

The future labour market will mean a need for new skills. Consequently, participation on courses – in one way or another – is a good investment to give yourself as an employee – and it certainly is for the employer as well.

ABOUT DANSK LABORANT- FORENING/HK (DL-F)

Dansk Laborant-Forening/HK (DL-F) is a cross-union association in HK.

We organize approx. 10,000 members whose primary educational background is laboratory assistant, laboratory technologist, environmental engineer or environmental technologist; they are employed in the private as well as the public sector.

The majority of members work in production companies, in analytical and control laboratories, in research laboratories, in universities or in municipal utility units and technical services.

In Dansk Laborant-Forening/HK (DL-F) we are working for a strong, professional community of interests and for the future security of the education and training system – and to retain and create job opportunities within the area we organize.



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