



ChainCraft

It all started with a breakthrough discovery at Wageningen University. For the first time it became clear that valuable biochemicals, in the form of medium chain fatty acids, could be produced out of organic waste streams. This could be big step forward from the standard composting or digestion of organic waste to biogas. The last 10 years ChainCraft worked on this disruptive biobased innovation, scaling up from laboratory to pilot scale and then on to an operational and commercial demonstration scale. As with most start-up ventures it has been a challenging and bumpy road. Now in the scale-up phase, with a technically and economically viable concept, ChainCraft is ready to grow towards a competitive challenger in the chemical industry.

Our People

At ChainCraft a small group of dedicated people work hard every day on making the world more sustainable. We work at ChainCraft because we have a passion for sustainability and the circular economy and we want to do our bit to make it real. We like a challenge, have a 'can do mentality' and don't walk away from taking responsibility. The fact that ChainCraft is a start-up/scale-up makes our work very diverse, so we are used to continuous change. We have a small team which means we know everybody, we can communicate openly, and if there is a problem there is always somebody willing to support. If this sounds to you like the place you want to be working in, please check out our internship possibilities below!

Our Technology

ChainCraft develops and exploits proprietary fermentation processes to produce biochemicals from organic waste and residues. The first product range, C4 to C8 Medium Chain Fatty Acids (MCFA), can be used in existing and new applications in e.g. animal feed, lubricants, plasticizers, polymers, coatings and flavours and fragrances. ChainCraft uses open mixed culture fermentation as technology to produce its fatty acids. This non-GMO, non-sterile, continuous type fermentation leads to several operational and cost advantages. Due to the nature of the technology, a wide range of low grade feedstocks like food waste, agricultural residues or the organic fraction of municipal solid waste can be used.

A commercial demonstration plant was engineered and realized in the Port of Amsterdam and started operation in 2020. With the process of ChainCraft organic waste and residues are converted into a mix of Medium Chain Fatty Acid carboxylates (MCFC or MCFA salts) via a two-step fermentation. After the fermentation, the broth containing the MCFC is clarified and concentrated. In its demo plant, the MCFC are purified, concentrated to a 50% solution or dried to a solid product of mixed fatty acid sodium salts. For the full-scale factory, the goal is to produce fractionated medium chain fatty acids (MCFA). The purified fatty acids will be sold for multiple applications in various markets, requiring often a high purity.

Internships possibilities

Feedstock Market Research

The mission of this internship is to deliver an extensive overview of feedstock and their properties which are available in the Dutch market. ChainCraft is using organic residues as feedstock to produce its medium chain fatty acids products. These organic residues can come from all parts of the food value chain. From agricultural by-products, to fruit and vegetable leftovers and from out-of-date products from supermarkets the organic fraction of municipal solid waste. To optimize our current and future production and business case it is vital to have a good overview of the possible feedstocks, its composition, market info and prices and legal situation.



Desired outcomes of the internship:

- Deliver a structured and complete overview of all potential feedstocks on technological, market, legal and economical properties by interviewing ChainCraft staff, doing desk research and contacting feedstock suppliers.
- Setting up a multi criteria analysis for evaluation and prioritization of feedstock streams for ChainCraft's current and future factories.

Required profile

- MSc student in technology, business or science with an interest in the sustainable economy
- Fluent in English and Dutch
- Has the following competencies:
 - Analytical skills — Able to structure and process qualitative and quantitative data and draw insightful conclusions from it. Exhibits a probing mind and achieves penetrating insights.
 - Persistence — Demonstrates tenacity and willingness to go the distance to get something done.
 - Creativity / innovation — Generates new and innovative approaches to problems.
 - Work ethic — Possesses a strong willingness to work hard and sometimes long hours to get the job done. Has track record of working hard.
 - Listening skills — Lets others speak and seeks to understand their viewpoints.
 - Communication — Speaks and writes clearly and articulately without being overly verbose or talkative.
 - Teamwork — Reaches out to peers and cooperates with supervisors to establish and overall collaborative working relationship.
 - Independent — Can work independently on the internships with weekly supervision meetings but also knows when to reach out in between when needed.

Timeline

Start in Q4 2021

Product development

ChainCraft is currently producing a small range of products to supply its customers with future proof, sustainable biobased solutions. Since these products are new on the market ChainCraft is continuously working together with its customers to develop new or improved products. All these products are based on our biobased medium chain fatty acids. This internship will be focused on characterizing and improving current products as well as looking into possibilities to make new products.

Possible activities

- Characterize our C-Craft Liquid and investigate why there are differences with the synthetic copy of the same mixture as well as improving its properties.
- Improve properties of our C-Craft Powder by testing different process conditions.
- Investigate how to improve look and smell of products.
- Looking into possibilities for new product forms.
- Produce the fatty acids out of fatty acids salts to perform tests and to provide test samples to our customers.

Required profile

- MSc Food technology (preferred) or (bio)chemical engineering.
- This internship will mostly be hands-on laboratory work and if the internship goes well the results will be used directly in our factory.

Timeline

Start in Q1/Q2 2021



The Matlab challenge: Building a production dashboard

ChainCraft's commercial demonstration plant is fitted with over 200 sensors, more than 70 pumps, and 100 actuated valves. Our laboratory is measuring well over 100 of individual component concentrations a day. All of this generates massive amounts of data that ChainCraft's process engineers use to steer the production processes in the plant. To streamline this process ChainCraft is developing its own software in Matlab. Essentially a dashboard has been created that can combine data from the factory, the laboratory and logbooks to provide an integrated overview of the process. The subject of this internship will be to create new dashboards based on the current template and improve the existing ones. Anything you develop will be used within weeks in our production process!

Activities

- Using Matlab to create new dashboards;
- Using Matlab to improve on existing dashboards;
- Test and validate the created dashboards using the data from our plant and laboratory;
- Using the created dashboard to analyze the process unit and make suggestions for further improvements.

Required profile

- MSc biotechnology/chemistry/chemical engineering/food technologist/quality control or related studies **or** MSc/BSc in IT with interest in biotechnology.
- Interest and experience in programming with Matlab.
- Independent and able to work from home (as long as the corona home working restrictions are force).

Timeline

Start in Q1/Q2 2021