PRAXIS

A publication by Bioengineering AG

Once a small psychiatric clinic in the São Paulo countryside, Cristália has grown into one of Brazil's largest and most innovative biopharmaceutical groups, and the only one capable of producing the complete drug chain from conception of the molecule through to the final product. This Praxis edition highlights their patented animal-free collagenase, a product derived from Brazilian biodiversity and the first time in history that Brazil was able to export biotechnology for therapeutic purposes.

BIOENGINEERING

Bioengineering AG
Sagenrainstrasse 7, 8636 Wald, Switzerland
T +41 55 256 81 11
info@bioengineering.ch, www.bioengineering.ch

Bioengineering –
inspiring excellence

Itapira (SP), Brazil, 18:09

Itapira industrial complex, API manufacturing.

Contents

1972
established

5600
employees

350
drugs produced

116
global patents

59%
of ingredients manufactured in-house

95%
of Brazilian hospitals supplied

30
countries exported to

4%
R&D spend

17
hectares of conservation area

The industrial complex in Itapira and other sites

Cristália's Pharmaceutical, APIs, and Biotechnology Industrial Complex was established at the site of the same farm where Cristália Nursing Home once operated, in the setting of rural São Paulo, surrounded by rolling hills and the Atlantic rainforest.

Built on approximately 70,000 m² of land, this is one of the largest pharmaceutical industrial complexes in Latin America. Eight state of the art manufacturing plants operate in Itapira: a dedicated research, development and innovation facility, two pharmaceutical plants; two plants manufacturing oncology APIs and the end product; a second API plant and two biotechnology plants in addition – one of them dedicated to anaerobics.

The most recent expansion is the 3,000 m² manufacturing facility that produces APIs specifically for oncology. Since Brazil currently imports 100% of the ingredients for the manufacturing of therapies for cancer treatment, Cristália invested a further 150 million BRL in 2019 to produce six different high potency APIs to meet the country's need with the number of manufactured ingredients as high as 18. These ingredients will be employed in the manufacturing of drugs to treat cancer (breast, lung, marrow, bone, and brain cancers) and adenoma.

Within this complex, more than 350 drugs and ingredients are produced, including anesthetics (a segment in which the company is a national leader), antiretrovirals, drugs for cancer treatment, dermatological products, and chemical or biotechnological Active Pharmaceutical Ingredients (APIs).

Other than the Itapira industrial complex, Cristália also operates manufacturing facilities of acquired or affiliated companies: the Latinofarma plant, manufacturing ophthalmology drugs in Cotia (SP); IMA, a pharmaceutical company manufacturing injectable drugs for oncology in Buenos Aires, Argentina; two plants for antibiotics and inhalational anesthetics at the Instituto BioChimico in Itatiaia (RJ), and Cristália Pouso Alegre (MG), which manufactures large-volume parenteral solutions, and, as of April 2021, medications for orotracheal intubation, in addition to others used to treat patients severely affected by Covid-19. In total, there are 13 totally operational manufacturing plants.

Warehouse containing raw materials, packaging and PPE.

Dr. Ogari de Castro Pacheco

“Always a step ahead”

Almost 50 years ago, my colleague, Dr. João Stevanatto and I decided to establish a pharmaceutical company to meet the needs of patients in our Itapira nursing home and psychiatric clinic. Few believed then, that what seemed more like an adventure, would end up becoming one of the largest pharmaceutical laboratories and most innovative healthcare companies in the country.

In 1972, when Cristália was established, there were as many as 90 million Brazilian citizens. Only a small portion of the population – the so called ‘registered’ employees with formal jobs in companies together with their dependents – had access to public healthcare services. An even smaller portion was represented by those belonging to the upper class, the top of the social pyramid, who sought out private doctors and hospitals.

At the same time, when the vast majority of the population got sick, they had to wait in long lines at one of the few public hospitals available for them. Access to medical services and drugs was a matter of luck.

While we were doing our part to treat patients, this lack of access was amplified by the fact that most basic medications were imported, and João and I understood that in order for patients to receive proper treatment, we had not only to diagnose, but also produce the drug ourselves. This desire to play a part in improving public healthcare in the country led us to invest all our savings in our small pharmaceutical company.

In four years, we were able to successfully manufacture Haloperidol, a powerful antipsychotic drug. That first win leveraged many others. We quickly established a partnership with the old Federal Government’s Medicines Center (CEME) to supply drugs to public hospitals at affordable prices, and in 1982, we started exporting internationally, to Mozambique, Africa. In Brazil, we were quickly recognized as a market leader in anesthetics and narcotic painkillers.

But João and I thought it wasn’t enough. At that time, we bought Active Pharmaceutical Ingredients (APIs) produced abroad by foreign companies to manufacture our drugs, and our next goal became to locally manufacture 100% of our products. In 1983, we started to synthesize our first APIs.

The Constitution of 1988 changed the country, granting new rights to its citizens, and posed significant challenges for governments and companies. The Unified Healthcare System (Sistema Único de Saúde, or SUS) was created under the Constitution, warranting every citizen the right to receive free healthcare services regardless of their professional status. While SUS may have its fragilities, the truth is that no continent-sized country around the world, let alone one with more than 200 million residents like Brazil, has been able to implement such a broad healthcare program. This increase in access to hospitals, necessitated a corresponding increase in the need for drugs.

Another milestone for access to healthcare in the country was the Generic Drugs Act of 1999, which permitted manufacturers to legally produce generic drugs that were identical to off-patent innovator drugs.

And, once again, we took the road less travelled. It was clear that most Brazilian pharmaceutical companies would be looking to target the production of generics for drugstores and hospitals, because of the high demand and lower research investment, and we would too – as and when a specific need from the government or our customer hospitals existed. But it was clear that we had to push our mission beyond that point: we had to look to the

future and invest in new therapies. At that very moment, we coined Cristália's motto: Sempre um passo à frente – Always a step ahead.

Staying true to our motto has called for making bold decisions. In 2001, for example, we began manufacturing antiretrovirals for the treatment of HIV/AIDS, enabling its distribution by the public network. A few years later, the Ministry of Health decided to grant a compulsory license for Efavirenz – an imported drug for AIDS treatment – and asked Cristália to produce it. Together with other interventions, this has helped Brazil to become recognized as an international leader in the prevention and treatment of this syndrome.

In almost 50 years of existence, our accomplishments have always come from investing in science. One that I'm particularly proud of is the vertical development of Iodenafil carbonate – a PDE 5 (Phosphodiesterase 5) inhibitor and the active substance in Helleva. This was the first molecule to be totally developed in Brazil, and the world's fourth original molecule developed for erectile dysfunction treatment.

The once small pharmaceutical plant located at the nursing home in Itapira has today become a company of 5,600 employees with 13 manufacturing facilities, 116 patents granted, over 350 drugs in line, more than 500 different presentations, and the jewel in the crown is the ability to produce the first biotechnological drugs in the country.

I must confess that I've always been passionate about biotechnology, which is, in my opinion, state-of-the-art in health breakthroughs. That these two biotechnology plants at the Itapira industrial complex now operate only a small distance from the place where João and I once built our first pharmaceutical company is a dream come true. These two plants house production of Cristália's Human Growth Hormone (GH) and the globally patented animal-free collagenase enzyme.

In August 2019, when we launched the first plant in Latin America dedicated to manufacturing high potency APIs for drugs against eighteen types of cancer, I was asked why a man my age had decided to invest 150 million BRL in something that would only bring financial returns in the long term. And I gave an honest answer: "I'm not going to be around forever, and I want to leave a legacy."

Dr. Pacheco has a medical degree from the University of São Paulo Medical School – São Paulo, Brazil.

He has led the pharmaceutical company Cristália Produtos Químicos Farmacêuticos Ltda. since he founded it in 1972. He serves as Director to Sindusfarma; chairman of ABIFINA; member of the Advisory Board of the Medical School Foundation of the University of São Paulo, and member of the Executive Board of the National Center for Energy and Materials Research (CNPEM).

Rare Actinomycetes isolated from Brazilian soil samples.

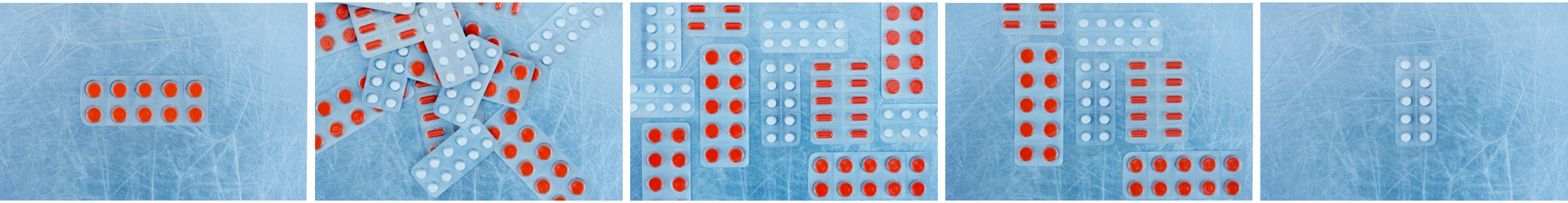
Sustainable production

All Cristália plants have been designed to operate under the most stringent sustainability standards. The Itapira industrial complex was built in the surroundings of six Permanent Preservation Areas (PPAs), as determined by the company itself as of 2011.

PPAs are protected areas under Brazilian law; sometimes covered by native vegetation, with an environmental role – to preserve water resources, the landscape, geological stability, biodiversity, the genetic flow of fauna and flora, to protect the soil, or to assure the wellbeing of its human population. The PPAs introduced by Cristália now occupy over 17 hectares, and are home to over 17,000 seedlings of native Atlantic rainforest vegetation.

Careful use of water resources, sewage treatment, rational use of energy, as well as sustainable disposal of solid wastes are also part of the company's daily concerns.

From ingredients to biotechnology



From its first antipsychotics, Cristália turned its focus to anaesthetics, muscle relaxants and narcoanalgesics, such as morphine and meperidine. Today, the company supplies 95% of Brazilian hospitals in addition to being the biggest anesthetics manufacturer in Latin America.

As the need to reduce dependence on foreign imports became increasingly apparent, Cristália's founders invested in manufacturing their Active Pharmaceutical Ingredients (APIs) locally.

That initial investment in 1983, has enabled the company to produce 59% of the ingredients required to manufacture its drugs today, compared with other domestically produced drugs in Brazil which typically import over 90% of their APIs. This has made Cristália a benchmark in active ingredients, with finished products being exported to over 30 countries worldwide.

A bolder step was still to come: the production of active biological ingredients for the manufacturing of biologicals and biosimilars, which was accomplished with the manufacturing plants for Biotechnology (2013) and Biotechnology-Anaerobics (2014).

The biotechnology division

In the early 2000s, Cristália established the Biotechnology Division to manufacture biological products by using recombinant DNA-molecular biology tools.

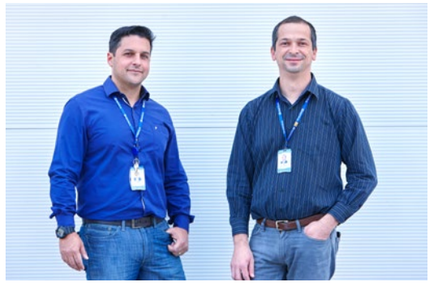
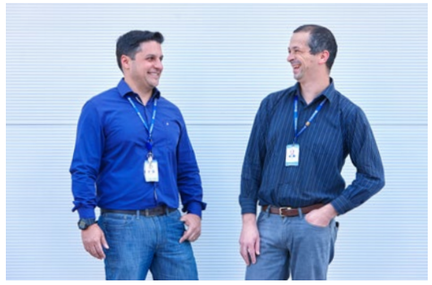
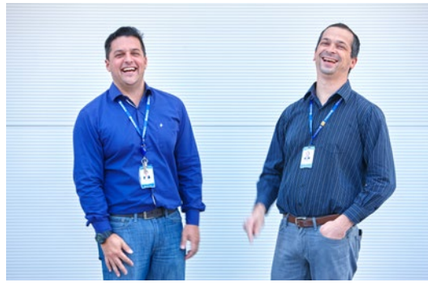
Initial investments were focused on building a Research and Development (R&D) laboratory and establishing a multidisciplinary technical team. Comprised of researchers in molecular biology, microbial fermentation, biomolecule purification & characterization, this team was able to conduct all phases of the biotechnological path.

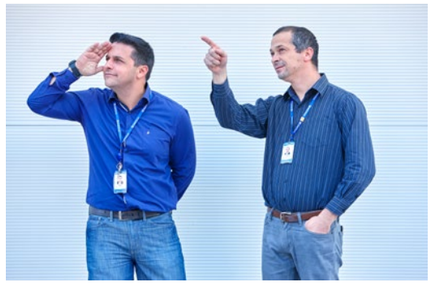
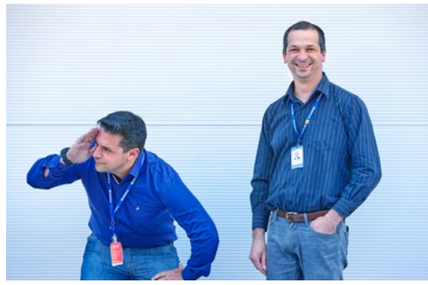
Prof. Dr. Spartaco Astolfi Filho and Dr. Josef Ernst Thiemann, both highly experienced and respected professionals in industrial biotechnology, and in particular the implementation and development of processes for the former Biobrás – the first Brazilian company to produce recombinant human insulin in Brazil – were responsible for recruiting and training the manufacturing process team.

The R&D laboratories accomplished several different phases necessary for biologicals development: expression vectors, high cell density bacterial fermentation, animal cell cultures, protein purification, and biomolecules characterization. Cristália's professionals enhanced and improved the industrial scale in accordance with the resolutions issued by the National Sanitary Surveillance Agency (ANVISA).

Scientific experts and Tech Ops:
Cristália's biotechnology all-stars

Production staff Sérgio and Ney

Two protein expression and purification platforms using genetically-modified organisms were established at the bench scale, the first for the production of pharmacologically interesting proteins by high cell density recombinant *Escherichia coli* fermentation, and the other for producing highly complex proteins in animal cells (e.g., CHO, BHK). A third platform, using wild type Biosafety Level 2 anaerobic bacteria, has allowed the development of complementary therapeutic proteins.

Based on promising research results, the company invested in the construction of three large-scale manufacturing facilities operated by a qualified and multidisciplinary professional team to produce biologicals of the highest quality and in compliance with stringent regulatory safety requirements.

This resulted in the registration of two biological products with ANVISA:

- Somatropin, the first Human Growth Hormone biosimilar product fully developed in Brazil.

- Collagenase, an enzymatic complex for the debridement and accelerated healing of dermal ulcers, wounds, burns and necrotic tissue. This is the first biological product that has originated from Brazilian biodiversity with patents awarded in the United States and Europe.

Somatropin

Human Growth Hormone

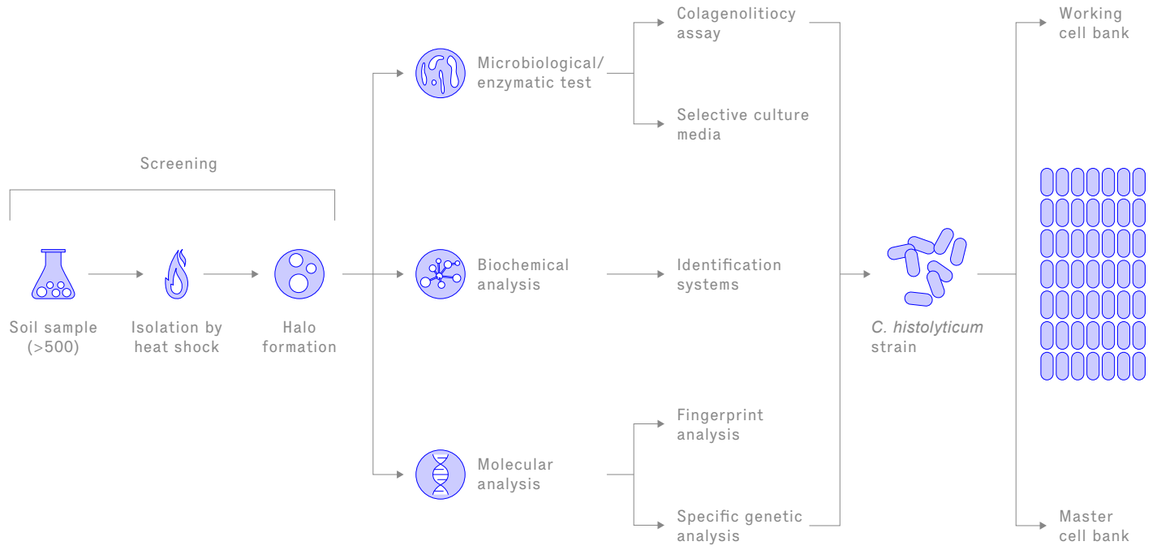
Somatropin is a hormone for the treatment of children living with growth deficiencies due to reduced hormone endogenous production. The project is 100% Brazilian, from genetic engineering to the production of active biological ingredients at industrial scale. It was made possible as part of a Productive Development Partnership (PDP) with Fiocruz/ Biomanguinhos, with the goal of improving access to medicine through the health system provided by the Brazilian government. It also provides for technology transfer so that government entities may eventually manufacture the capacity required to meet the demands for human growth hormone locally.

The somatropin plant was inaugurated in 2013, and has been fully operational ever since. It was designed to operate at large scale with genetically-modified, Risk Class-1 microorganisms (harmless to human health and the environment). Biosafety quality certification was granted by the National Technical Committee on Biosafety (CTNBio).

In May 2019, Cristália's somatropin was approved as a biosimilar product by ANVISA. It followed ANVISA's regulatory comparability pathway (Comparator drug: Pfizer's Genotropin®) in accordance with international standards, following pre-clinical, Clinical Phase-1 and Clinical Phase-3 studies, the latter conducted on Brazilian children affected by growth deficits.

During the drug development phases, the quality, safety and efficacy profiles demonstrated biosimilarity – similar characteristics as commercially available drugs, which reflect not only the scientific caliber of the team of professionals involved, but also the standards of excellence adhered to by Cristália.

Animal-free collagenase



New and rare microorganisms

In light of alarming reports from the World Health Organization (WHO) about the emergence of multidrug resistant bacterial strains and the simultaneous decline in the number of new therapeutic molecules, Cristália invested in the bioprospection of rare microorganisms by screening Brazil's rich biodiversity to obtain new therapeutic drugs.

This project was in capable hands under Dr. Josef Ernst Thiemann, who brought vast experience in the discovery of novel microorganisms, including those that could be used to produce new antibiotics. He led the search for novel microorganisms in soil samples, representing totally new and undescribed antimicrobial and antitumoral characteristics.

The first big success arrived with the discovery of the *Clostridium histolyticum T248* strain at a country farm in Espírito Santo do Pinhal (SP), which, after extensive assays and molecular characterizations, exhibited genetic features similar to the reference strain, as well as a superior yield of around 40% more collagenase in an animal-free culture medium.

This strain is employed in Cristália's manufacturing process, yielding the product Kollagenase. In 2016, the Brazilian healthcare authority ANVISA authorized the company to manufacture the product at industrial scale, and a patent was granted in the United States in 2017. Since then, millions of tubes of the Kollagenase ointment have been marketed.

The Bioprospecting Platform now has a catalog of almost 5,000 new and rare microorganisms, originating from different habitats throughout Brazil and duly isolated and characterized. Results derived from this platform are very promising and substantial – after initial tests with complex extracts, fungicidal, bactericidal, and antitumoral effects have been reported. Fractioning and physical-chemical assessments have shown a high degree of molecular novelty and promising therapeutics effects not yet described in the Dictionary of Natural Products.

Given Cristália's commitment to more effective, selective, affordable, and wellness-supporting therapies, Kollagenase has been represented in its portfolio for over 40 years, initially using imported APIs.

This is a highly effective drug and enzymatic debridement agent with or without topical antibiotic therapy for the treatment of wounds, ulcers and necrotic lesions (pressure, burns, varicose, gangrene, frostbite injuries) and for other uses such as prior to skin grafts, or postoperative where healing may be more challenging.

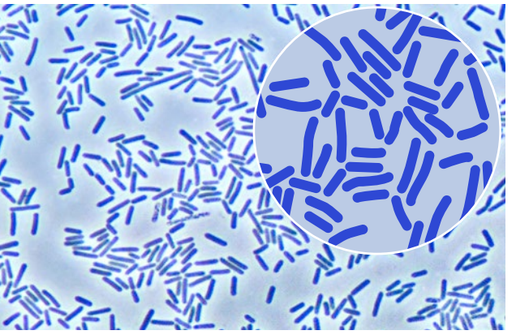
Its mode of action is based on the specific activity of the enzyme complex collagenase, which catalyzes a biochemical reaction to crack exposed collagen fibers in necrotic tissue. Collagen fibers represent the most abundant protein in the human body; their role is to structure tissues. For treatments of dermal ulcers, burns and other serious wounds, collagen fibers need to be broken down, so that dead tissue can be removed (debridement) to allow for proper healing of the tissues. Studies in vitro and in vivo demonstrate the liquefaction of the necrotic tissue without compromising the healthy, new granulation tissue.

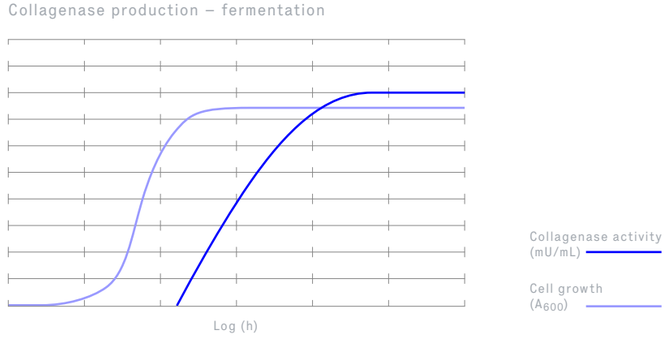
The enzyme complex collagenase is produced by the anaerobic bacterium *Clostridium histolyticum*. Cristália wanted to develop its own API with unique features, targeting a technology differential while maintaining the pharmacological characteristics of collagenase.

Building on the R&D team's knowledge, studies were undertaken to substitute the traditional culture medium with one free from animal-derived ingredients, while keeping the productivity and activity of produced collagenases intact. This was fully accomplished at bench scale and subsequently replicated at industrial scale. This manufacturing method improves the safety of the product, enabling its introduction into highly regulated markets, as well as allows for new uses and enhanced pharmaceutical formulations. Cristália was awarded patents in the United States (US9725692) and Europe (EP2865748), to produce animal-free collagenase.

Anticipating an increasing demand and scale upgrade, the construction of the manufacturing plant for anaerobic bacteria was started in 2013. The building would house two seed fermentors and one production fermentor for collagenase manufacturing, meeting the requirements of Biosafety Level 3 as mandated by the Brazilian ministry responsible for ensuring employees' health and safety. In 2014, industrial scale operations started and Cristália received a Certificate of Good Manufacturing Practices (GMP) from ANVISA, followed shortly thereafter by a new registration for the drug Kollagenase in Brazil.

In 2019, Cristália expanded its product line, having registered the drug Kollagenase + Chloramphenicol, and Ginokollagenase (gynecological indication).





Production process

The production process of collagenase is an anaerobic fermentation of the microorganism *Clostridium histolyticum*. A team of highly trained and specialized operators work in shifts 24 hours a day to set up equipment, prepare and sterilize media, inoculate, sample, conduct microscopy analysis, record data, and control production parameters and activities in accordance with good manufacturing practices.

Critical points in the process are the transfers of Clostridium cultures from the cell bank cryovial to consecutive seed fermentors and the main production fermentor. Maintaining sterility conditions – ensured through good manufacturing practices and extensive operator training – is essential to avoid external contamination.

During the fermentation stage, temperature, pH, agitation are controlled, and the microorganism's responses, cell growth and morphology are monitored.

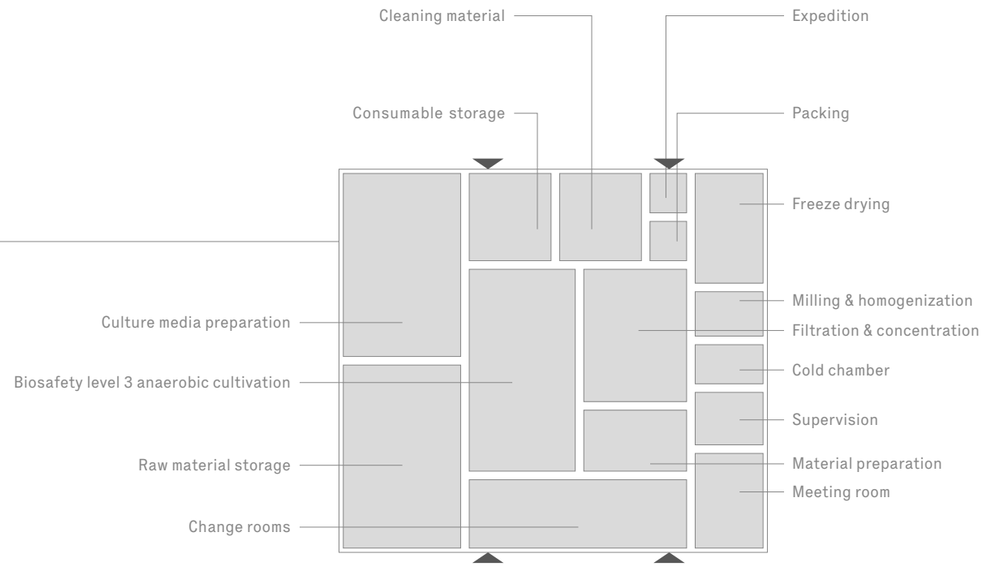
In these highly controlled conditions, the microorganism secretes the collagenase enzyme into the extracellular medium which is then processed in sequential steps of tangential filtration for cell removal (clarification), concentration and purification of the collagenase.

The final step includes stabilization and a complex freeze-drying or lyophilization; this step is essential due to the sensitivity of the enzyme collagenase. Milling and homogenization preserve the high enzymatic activity and purity, after which the obtained collagenase API is stored, then formulated into an ointment base at Cristalia's pharmaceutical facility.

Cryovials being prepared to seed fermentor.

Project plan and execution

Cristália's biotechnology division



Block layout of the biotechnology – anaerobics building

Upscaling manufacturing capacity

After R&D, the feasibility study for a higher-capacity production plant began. The data obtained at lab scales (R&D) was the foundation for defining the ideal geometry and scale of the fermentation system, and dimension of the tangential filtration membranes.

Together with the engineering and maintenance department, the architectural design and utility supply (both black and clean utilities) necessary to fulfill the demands of the equipment were planned. As the facility was built to meet Level 3 biosafety concepts, Cristália chose an integrated fermentation system to minimize open operations with the microorganism *Clostridium histolyticum*, and selected a reliable partner in Bioengineering for the project.

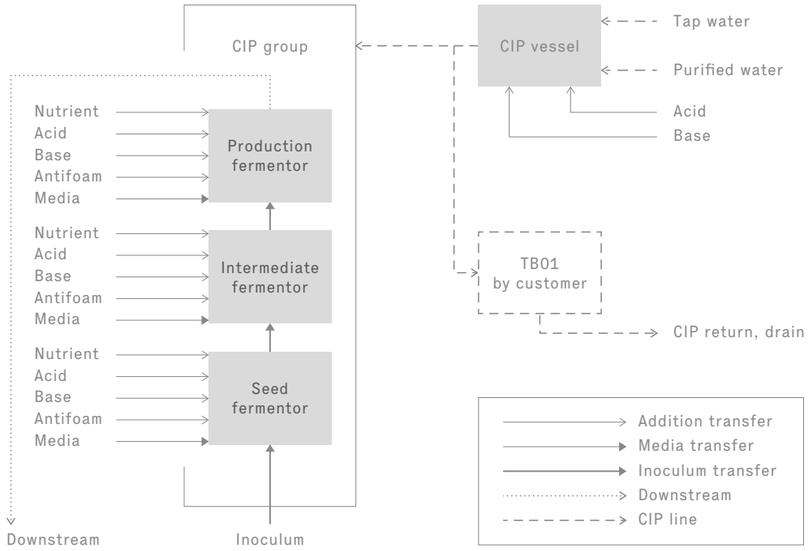
Bioengineering's many years of experience with customized microbial fermentation systems and the support of their local representative in Brazil, who has been associated with the company since 1991, were some of the factors that led to Cristália's decision of technology supplier.

Time schedule

Fulfilling all milestones on time and on budget for a complex, high-stakes project of this nature, necessitated a disciplined and well-coordinated project organization.
The straightforward cooperation between Bioengineering's technical departments resulted in progress that was fast and error-free.

The schedule from basic engineering through to SAT completion and takeover was 14 months (272 working days). Individual tasks and the overall progress were closely monitored and managed, with frequent communication between the Bioengineering and Cristália teams. This close collaboration during the detail engineering phase built up trust, which followed through to the Factory Acceptance Test (FAT), on-site installation and the Site Acceptance Test (SAT). All milestones were completed within the scheduled time frame.

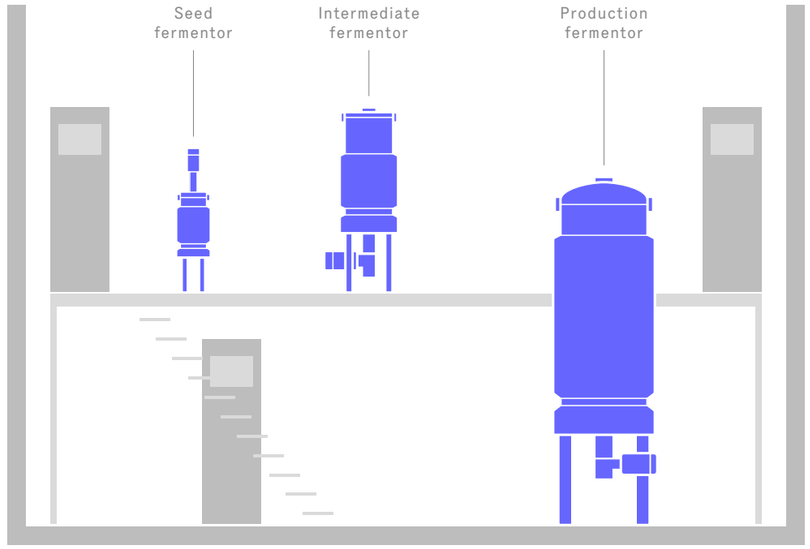
Scope of supply



Cristália developed an industrial scale process to synthesize collagenase and increase cell density by culturing the *Clostridium histolyticum* bacterial strain under anaerobic conditions. The specifications for the fermentor lines ordered at Bioengineering were made to run this process under its most productive conditions.

For the initial seeding stage of fermentation, the inoculum, which is prepared from cryovials and pre-cultivated in Cristália's laboratories, is transferred to a seed fermentor. The bacterial culture can then be transferred to an intermediate fermentor vessel, or directly to the main production fermentor by overpressure so that the sterility of transfers is guaranteed. Each fermentor has gas and feed lines which control the conditions of the process. In addition, a Cleaning-in-Place (CIP) unit was part of Bioengineering's scope of supply to ensure aseptic conditions are maintained in production equipment and pipelines. The cleaning agent is heated by a steam-operated heat exchanger and is circulated in the fermentors (merry-go-round) to ensure optimal energy and water usage.

Seed fermentor, Intermediate fermentor and Production fermentor.



BSL-3 production site

General arrangement

The seed and intermediate fermentors are placed on a platform, while the main fermentor and the CIP unit stand on the floor. Every vessel has a dedicated gas mixing station with sterile filters, an exhaust system, liquid additions, sampling unit and a harvest and drain bottom group including an agitator and a transfer line. After every batch, cleaning solutions are prepared in the CIP unit and then recirculated through all the fermentors and interconnecting piping prior to sterilization in preparation for the next batch. The entire system is placed in one cleanroom in accordance with Cristália's requirement and as worked out and drawn by Bioengineering.

The Layout of Cristália's biotech production is pictured top right with the seed fermentor on top left, the intermediate fermentor on top middle and the production fermentor on the bottom right. The CIP unit is not pictured.

All physical process parameters (temperature, gas flow, gas composition, overpressure, stirrer speed, level, pressure, pH and DO) are controlled by three different touchscreen HMI cabinets. The fermentors can be sterilized empty (with steam) or full (with the culture media) using completely automated operations with individually programmable timers and temperatures. Parameters for all other operations such as CIP, harvest transfer, media line sterilization etc. are also individually programmable. Operations and control loops are described in a Functional Design Specification (FDS). Bioengineering's own Supervisory Control and Data Acquisition (SCADA) is available in different languages, and Cristália elected to run their production software in Portuguese.

An operator equips the intermediate fermentor with measuring probes before starting a batch.

Plant in operation

System flexibility

The Cristália project was designed to enable flexible industrial cultivation of both anaerobic as well as aerobic bacteria at different production scales. In addition, the smaller fermentors can be used for the research and development of new products using different microorganisms.

Verification and approval

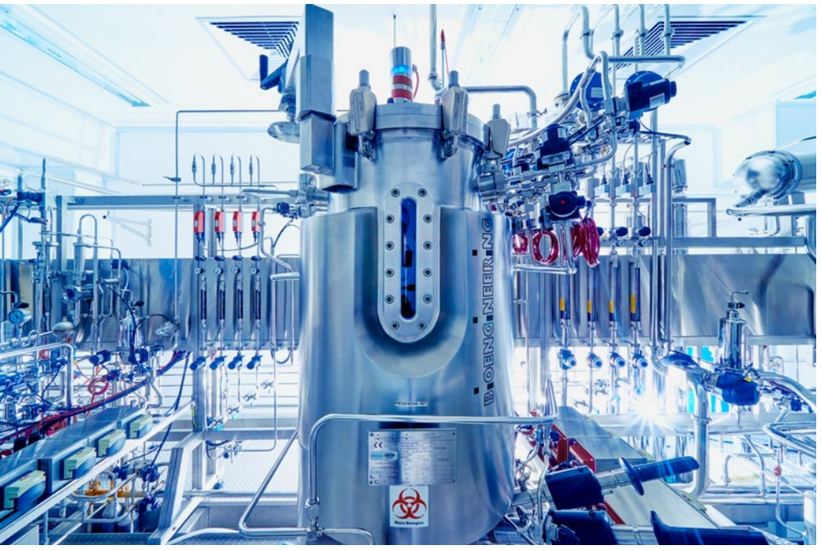
The complete mechanical installation and functions described in the FDS were checked and then tested to ensure that the plant was built in accordance with specifications, and components and controls were working to fulfill the desired functionality. After Bioengineering's exhaustive internal pre-FAT (Factory Acceptance Test) regime in preparation for testing together with Cristália, the FAT was performed together with Cristália at Bioengineering's production site in Wald, Switzerland. Following shipment and reassembly, the Site Acceptance Test (SAT) was performed at Cristália's manufacturing site in Itapira, Brazil. Prior to takeover, Bioengineering also supervised a first test-fermentation using a non-recombinant *Escherichia coli* strain. This ensured proper mechanical assembly, a stable, functional software and sterile production conditions.

Marketing authorization

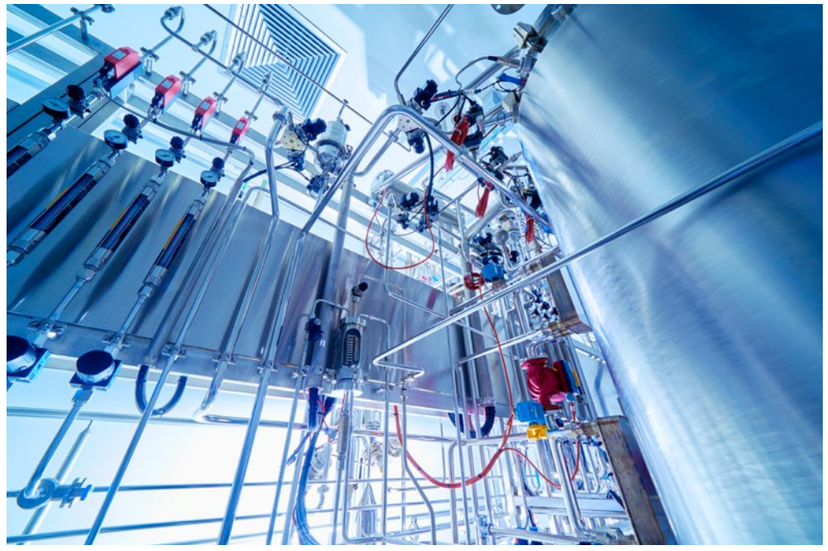
The documentation and validation fulfill the requirements of global regulatory authorities. Cristália's complete production line was successfully approved by the National Sanitary Surveillance Agency (ANVISA) and subsequently accredited with Good Manufacturing Practices (GMP). The patented collagenase production process using a culture medium free of animal components is the first time in history that Brazil is able to export biotechnology, increasing the visibility of Brazilian biodiversity and eliminating the need to import API collagenase. Given the product quality and rich history of the Kollagenase brand in Brazil, Cristália has ongoing initiatives to grow exports to new markets regulated by agencies like the FDA and the EMA, as well as countries in Latin America and others around the world.

Production fermentor with lid-lifting device.

Front view of the complete plant.

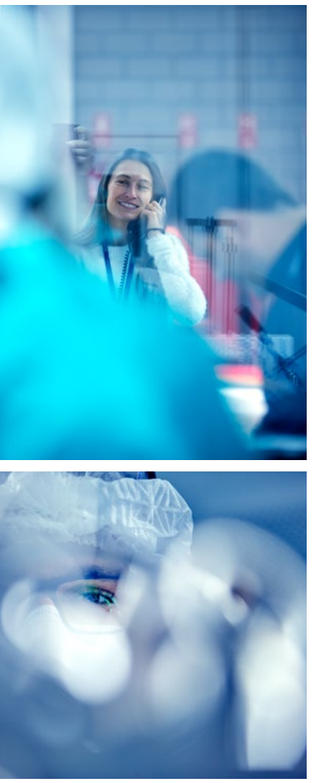


Front view of the intermediate fermentor.



Overhead and submersed gassing with mass flow controllers.

Operating the plant.



Brazil: the homeland of ethnical and cultural diversity

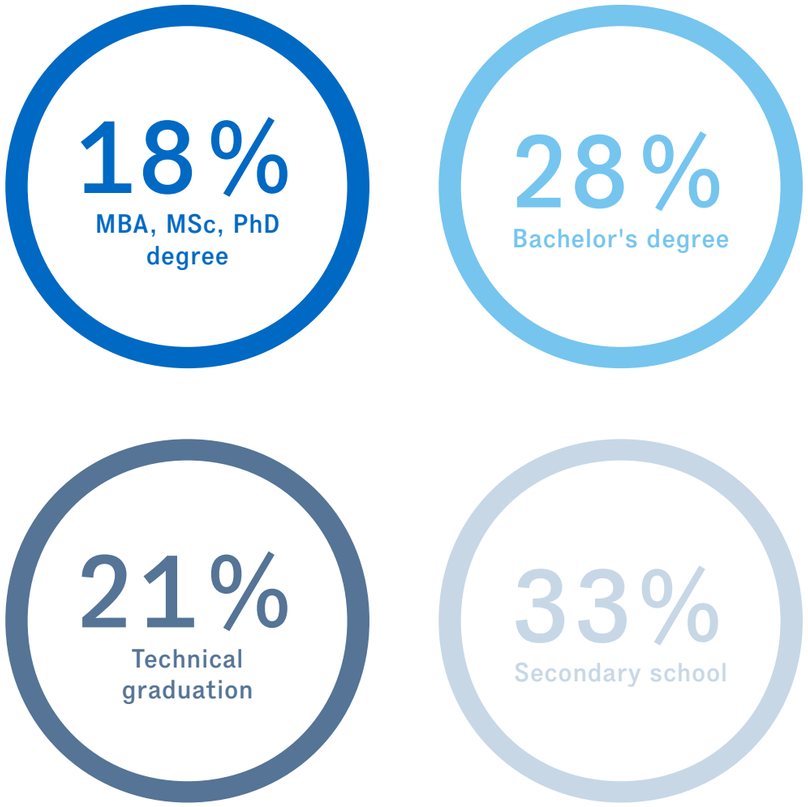
Discovered by the Portuguese in the year 1500, Brazil is one of the world's largest and most diversified countries, in terms of both ethnical and cultural background. It is primarily the history of Brazilian colonization, rather than the country's territorial expansion, that explains why its population is so multicultural.

According to the latest published census in 2010, 47.1% of the population described themselves as Caucasian, 43.2% as mixed-race, and 7.52% as African-Brazilian. Smaller numbers identify as Asian-Brazilian (1.1%), and indigenous, or native Brazilian (0.43%) respectively.

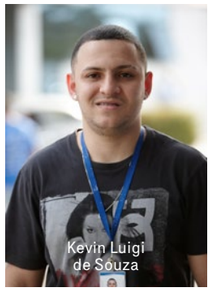
The census is carried out every decade by the Brazilian Institute of Geography and Statistics (IBGE, Instituto Brasileiro de Geografia e Estatística), which is responsible for the official collection of statistical information and social studies in Brazil. Characterized by a mixture of essentially three major ethnic groups: indigenous (native), Caucasian (particularly with the influence of Portuguese colonists), and of African descent (as a result of the Atlantic slave trade), our history ultimately created an unprecedented ethnical identity.

This is no different at Cristália. The company has over 5,600 employees coming from various areas of Brazil and around the world. The plurality of different traditions, habits, cultures, religions, and ideologies are the basis of Cristália's family.

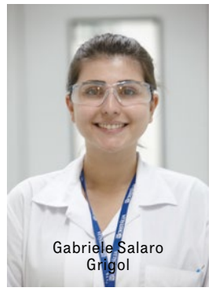
Employees


18%
MBA, MSc, PhD degree
28%
Bachelor's degree
21%
Technical graduation
33%
Secondary school


Kevin Luigi de Souza
Marcelo Shiguero Kamei
Gabriele Salaro Grigol
Roberto Bologna Jr
Paulo Adolfo
Ligia Maria Ferreira
Sérgio de Freitas Scanapieco
Allan Picolli Alves
Daniel Candido de Souza
Paula Alessandra Arcanjo
Jessica Cristina Salvarani
Sidney Teixeira Santatan
Lourdes Maria
Aurelio Cipoleta Neto
Welington Alves da Silva
Ana Lucia Magyori
Carmen da Silva
Roberta Boschiero
Júlio Cezar Souza
André Garcia Rosado
Andreia Cabral Gonçalves
Bianca Bitencourt
Murilo Ricardo da Silva Adão
Mariana Couto de Paula
Getúlio M. Azevedo
Robinson Carlos de Souza Cogni
Luiz Guilherme
Ailton Lira Amaro de Oliveira
Luis Alberto Monibe
Jaqueline Sartorelli


Kevin Luigi de Souza


Marcelo Shigueru Kamei

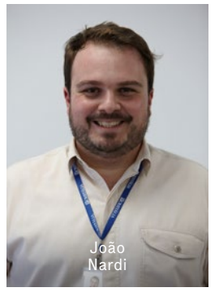

Gabriele Salaro Grigol


Roberto Bologna Jr


Paulo Adolfo


Ligia Maria Ferreira

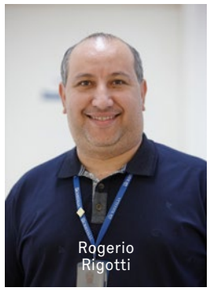

Claudia Bartoli Pelizaro


João Nardi

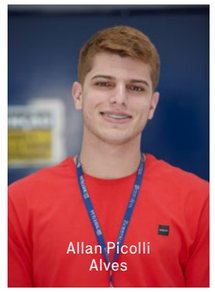

Giuliana Andra de Garcia

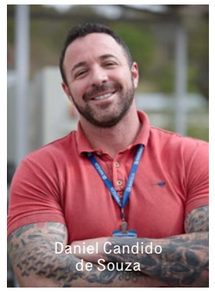

Fabiana Ribeiro


Renan Lopes da Silva


Rogerio Rigotti


Sérgio de Freitas Scanapieco


Allan Picolli Alves

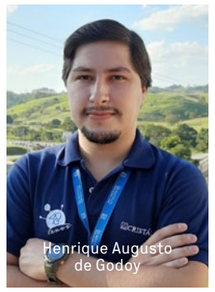

Daniel Candido de Souza


Paula Alessandra Arcanjo


Jessica Cristina Salvarani

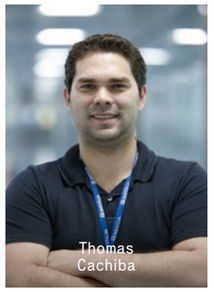

Sidney Teixeira Sanatan


Rubiana Ribeiro de Souza Jachetta

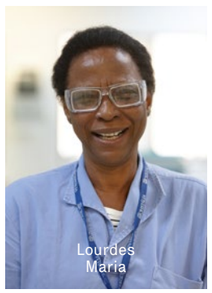

Henrique Augusto de Godoy

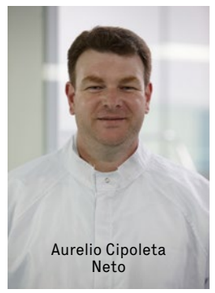

Diogo Silvério


Deives Eduardo Piquera


Thomas Cachiba


Osvaldo de Mello

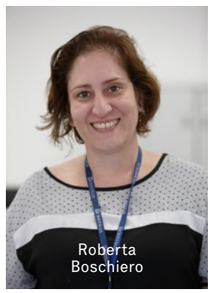

Lourdes Maria


Aurelio Cipoleta Neto


Welington Alves da Silva


Ana Lúcia Magyori

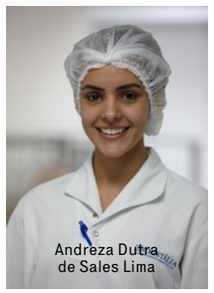

Carmen da Silva

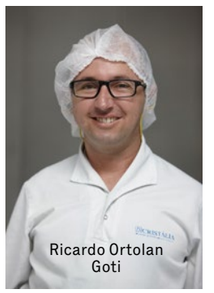

Roberta Boschiero

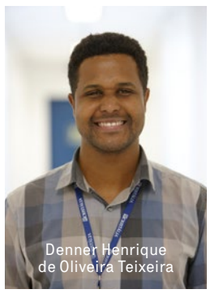

Patricia Moraes

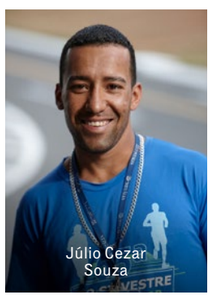

Jenifer Adriele Correa Pinto


Lucas Rafael Pompeo

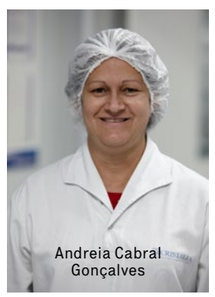

Andreza Dutra de Sales Lima


Ricardo Ortolan Goti


Denner Henrique de Oliveira Teixeira


Júlio Cezar Souza


André Garcia Rosado


Andreia Cabral Gonçalves


Bianca Bitencourt

Murilo Ricardo da Silva Adão

Mariana Couto de Paula

Nadia Fernandes Ribeiro

Luciano Borges de Almeida

Vanessa Caroline Marques

Ronaldo Olbi

Natalia Bortolucci Simioni

Anderson Fabricio de Oliveira

Getúlio M. Azevedo

Robinson Carlos de Souza Cogni

Luiz Guilherme

Ailton Lira Amaro de Oliveira

Luís Albertò Moribe

Jaqueline Sartorelli

Bruno Giovani Geraldi

Raphaela Hernandes

Mateus da Silva Ramos

Ronoel Aparecido Braz

Josiane Antão

Vanessa Yoshie Kumeda