Startups Developing Nanocellulose Products

IN 2020

PRESCOUTER

What are examples of companies revolutionizing the applications of nanocellulose across industries?

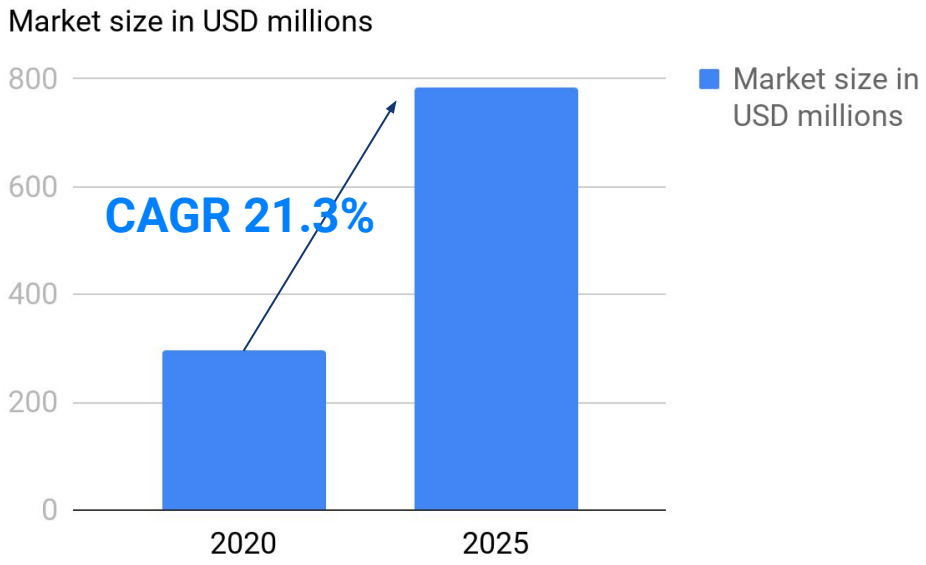
Cellulose, produced by plants and microorganisms, is one of the most abundant polymers found on earth. Cellulose fibers are composed of β-d-glucose monomers linked together through β-(1,4) glycosidic linkage. Separation of these cellulosic fibers results in nanocellulose. Nanocellulose exhibits distinctive structural, physicochemical, mechanical, and biological characteristics, including a reticulate fibrous three-dimensional web-shaped structure, high crystallinity, good mechanical strength, biocompatibility, biodegradability, optical transparency, high specific surface area, polyfunctionality, hydrophilicity, and moldability into 3D structures. With this wide range of properties, as well as its sustainability, nanocellulose is a prefered choice of material for applications ranging from paper and adhesives to electronics, health, and personal care products.

In this report, we examine the key startups inching the application of various nanocellulose products toward successful commercialization through medium- to large-scale manufacturing.

Executive Summary

The global nanocellulose market is valued at **USD 297 million** and expected to grow to **USD 783 million by 2025** at a record **CAGR of 21.3%**. The drive for sustainability is amping up the demand for nanocellulose, with significant funding from government and private sectors for research and development activities within the field.

Nanocellulose applications are driven by demand in the pulp and paper, cement, composites and plastics, pharmaceutical, healthcare, personal care, and electronics sectors. The biggest demand for nanocellulose comes from **pulp and paper industry**.



The biggest demand for nanocellulose comes from the pulp & paper industry.

Executive Summary

PreScouter investigated the space of the nanocellulose market in order to gain an understanding of the current state of new startups and medium sized companies driving the applications and business of nanocellulose. In this report, we detail a total **10 companies** from North America, Europe, and Asia as an example of leading firms in this space.

The nanocellulose products were classified according to their morphology and source as follows:

- Cellulose nanocrystals (CNCs)
- Microfibrillated cellulose (NFC/MFC)
- Bacterial nanocellulose (BNC)

CNCs and MFC are obtained via a top-down approach consisting of the disintegration of plant matter via chemical or mechanical treatment, whereas BNC is synthesized via a bottom-up approach from cultures of bacteria that synthesize the required material.

INTELLIGENCE BRIEF | NANOCELLULOSE 2020

Melodea Bio Based Solutions

INNTECH materials

nanocrystacell

CelluForce

BLUE GOOSE BIOREFINERIES INC.™

Valentis nanotech

EXILVA PROJECT

SWEETWATER ENERGY

AXCELON BIOPOLYMERS CORP

BOWIL | BIOTECH

Nanocrystalline cellulose

Nano/ Micro-fibrillated cellulose

Bacterial cellulose

10 COMPANIES revolutionizing the applications of nanocellulose across industries

Paper

Cement

Electronics

Adhesives

Plastics & composites

Paints & coatings

Personal healthcare

Medical & Health care

PRESCOUTER

Company	Location	Company Size	Founded	Type of Product	Manufacturing Capability	Applications
CelluForce	Montreal, Canada	11-50	2010	Family of products	300 t/year	All listed on the previous page
Blue Goose Biorefineries	Saskatoon, Canada	1-10	2007	Aqueous suspension that forms a gel	Pilot plant able to produce g to kg scale	Concrete admixture
Valentis Nanotech	Misgav, Israel	1-10	2013	Polymer film	Lab scale	Packaging, agriculture
Melodea Ltd.	Rehovot, Israel	11-50	2010	Additive	Inhouse capability; scale unknown	Packaging, paints & coatings
Nanocrystacell	Slovenia	11-50	2009	Solid product, water emulsion, polyethylene glycol, diethylene glycol, and ethylene glycol suspension	Unknown	Not mentioned
Innotech Materials	Wisconsin, USA	1-10	2014	Powder, thin film	Unknown	Packaging, personal care
Sweetwater Energy	New York, USA	11-50	2009	Gel	Commercial scale	Not mentioned
Exilva / Borregaard	Sarpsborg, Norway	11-50	2016	Additive	Unknown	Adhesives, agriculture, paints & coatings, personal care
Axcelon Biopolymers Corporation	Ontario, Canada	1-10	2001	Films	Demonstration scale	Medical & health care
Bowil Biotech	Wladyslawowo, Poland	11-50	2006	Films	Unknown	Medical & healthcare

Nanocrystalline Cellulose

CelluForce

Overview

CelluForce is a leader in the development and commercial production of cellulose nanocrystals (CNCs), an advanced biomaterial produced from wood. The company commercializes a family of CNC products under the brand name CelluForce NCC.

At a glance			
Founded:	2010	**Company Size:**	11-50 employees
Website:	https://www.celluforce.com/	**Headquarters:**	Montreal, Canada
Contact:	P: 1-514-360-1023 E: info@celluforce.com	**Product Name:**	CelluForce NCC

CelluForce

Product Overview

CelluForce is a leader in the development and commercial production of cellulose nanocrystals (CNCs), an advanced biomaterial produced from wood. The company commercializes a family of CNC products under the brand name CelluForce NCC.

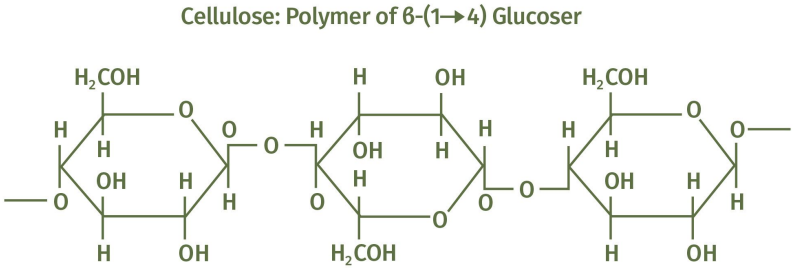


Figure 1: Molecular structure of cellulose

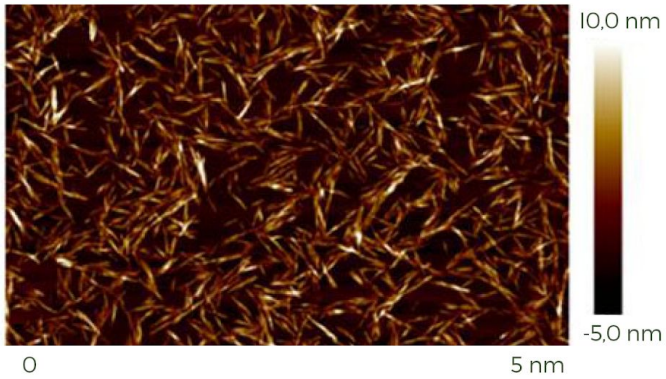


Figure 2: Micrograph revealing nano sized cellulose nanocrystals

Intellectual Property

Their intellectual property covers a wide range of areas, from the manufacturing process to surface modifications and applications development. CelluForce has access to a patent portfolio of over 50 patent families.

Product Properties

Self Assembly: Crystals that comprise CelluForce NCC interact with one another based on their size, charge, and shape

Strong: Each crystal has a stiffness that is of the order of 150 GPa and a tensile strength that is of the order of 10 GPa (comparable to Kevlar as well as hard metals and their alloys)

Thixotropic: Fluids containing CelluForce NCC are shear thinning, meaning they decrease in viscosity with the application of shear.

Active: Hydroxyl groups are involved in hydrogen bonding and make CNCs hydrophilic. Acidic groups make CNCs compatible with a number of solvents and polymer matrices.

Photonic: CelluForce NCC forms solids with structural color. The color is created by the interaction of light with the layered structures that are developed when a fluid becomes a solid.

High Surface Area: One gram of CNC nominally contains over 125 quadrillion (1016) particles, each with a nominal surface area of 4500 nm2, theoretically providing a surface area of about 550 m2/g of material.

Electromagnetic: CNCs have conductive and dielectric properties

Manufacturing Capability

CelluForce's manufacturing plant in Windsor, Quebec, Canada, is the first of its kind, with a production capacity of **300 tonnes** of cellulose nanocrystals per year.

CelluForce's CNC manufacturing plant. Source: CelluForce.

CelluForce is also a participant in the international standardization efforts being conducted by the ISO/TC 6/TG 1 Cellulosic Nanomaterials task group and is hence highly focused on quality.

Applications

Oil & Gas: A high-performance material that can be used in a wide range of oil field fluids and materials. It gives fluids a tunable structure that can be tailored to meet the formidable heat, pressure, and formation conditions present in wells.

Adhesives: Boosted performance in wood adhesives such as phenol-formaldehyde (PF) and urea/melamine-formaldehyde (UF/MF/MUF) through rheology modification, enhanced bond-forming, and the inherently high strength of CNCs.

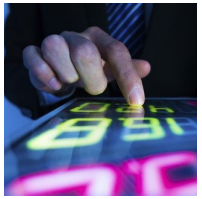
Paper & Nonwovens: When integrated into super absorbent materials (SAM), it increases absorption and improves structural integrity, creating opportunities to develop high-performance SAMs and to redesign existing products such as diapers and hygiene products to use less material.

Cement: CelluForce NCC can be used in different types of cement applications and has been shown to improve flexural strength, homogeneity, bubble size uniformity, and shrinkage.

Composites: CNC can increase the toughness of epoxy resins used in composite applications by over 150%.

Plastics: CelluForce NCC can also be used with polylactic acid (PLA) to improve properties and make bioplastics that are of equal quality to petroleum-based equivalents.

Applications



Electronics: CelluForce is working with partners to develop applications in the field of electronics. The properties that make CNCs attractive for such applications are particle suspension ability, electromagnetic response, and conductivity through functionalization.

Personal & Healthcare: CelluForce NCC is a valuable cosmetic ingredient that provides a texture that improves a product's feel in facial and body applications. It also has a good toxicological profile and can be a good high-performance base for drug delivery or a growth platform compatible with tissue and bone.

Food & Beverages: CelluForce NCC forms very stable emulsions that can improve the texture and suspension qualities of products in this sector, thereby developing healthy, sustainable, and safe food and beverages that appeal to ever more exacting customer needs.

Valentis Nanotech

Overview

Valentis Nanotech focuses mainly on its platform technology that combines cellulose nanocrystals with nanoparticles to create a unique material that can be used for a number of applications. The CNC acts a carrier for the nanoparticles and keeps them dispersed to prevent agglomeration. This means that the nanoparticle properties are preserved. The technology is customizable, thus allowing tailor-made application-specific material development. The end product is a polymeric film.

Cellulose Nano Crystals (CNC)

A biodegradable substance made from plant pulp waste with numerous inherent benefits, used as a carrier for nanoparticles.

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Nanoparticles

Nanoparticles are added to CNC to provide the materials with exceptional functionalities.

At a glance			
Founded:	2013	**Company Size:**	1-10 employees
Website:	https://valentis-nano.com/	**Headquarters:**	Misgav, Israel
Contact:	zvika@valentis-nano.com	**Product Name:**	Polymeric film

Valentis Nanotech

Manufacturing Capability

Valentis Nanotech has performed lab-scale tests and trials on its films. Since 2014, they have been working with an Israeli agricultural thermoplastic application company on new product development.

Applications

Food Packaging

Agricultural Films

Defense Coatings

Functional Coatings

Home & Garden Products

Transportation Coatings

Valentis Nanotech

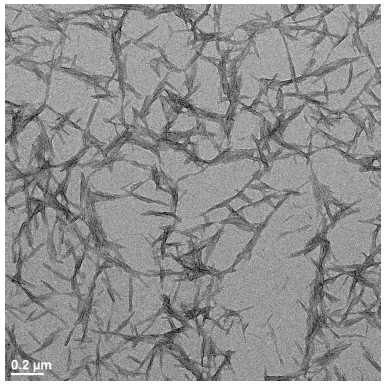
Material Properties for Each Application

Source: Valentis

Blue Goose Biorefineries (BGB)

Overview

BGB's primary focus is on the production of CNCs by biorefining lignocellulosic biomass. The company has one product called BGB Ultra. The product is an aqueous suspension of type I CNCs (viscose-grade dissolving pulp) sourced from aspen and maple wood. The suspension forms a translucent gel at a concentration of 8% w/w.



TEM of BGB Ultra. Scale: 200 nm. Source: BGB

At a glance			
Founded:	2007	**Company Size:**	1-10 employees
Website:	https://bluegoosebiorefineries.com/	**Headquarters:**	Saskatoon, Canada
Contact:	https://bluegoosebiorefineries.com/#Contact	**Product Name:**	BGB Ultra

Blue Goose Biorefineries (BGB)

BLUE GOOSE BIOREFINERIES INC.™

Product Properties

The following are features of the product:

- Uniform crystal size
- Non-Newtonian fluid behaviour (thixotropic)
- Chiral nematic network formation in water
- Dried films are birefringent
- No sulfate half ester moiety

Parameter	Value	Units	Test Method
Crystallinity index	80%		Segal method
Crystal length	100 - 150	nm	TEM
Crystal diameter	9 - 14	nm	TEM
Hydrodynamic diameter	150	nm	DLS
Zeta potential	-35	mV	DLS
Carboxyl content	0.15	mmol/g	Conductivity titration + FTIR

Main technical specifications of BGB Ultra

Blue Goose Biorefineries (BGB)

BLUE GOOSE BIOREFINERIES INC.™

Product Cost (as advertised on site)

BGB Ultra CNC 4.0 g Sample
$ 0.0

BGB Ultra CNC 74 g
$100.00

BGB Ultra CNC 148 g
$200.00

BGB Ultra CNC 1 kg
$1000.00

Source: BGB

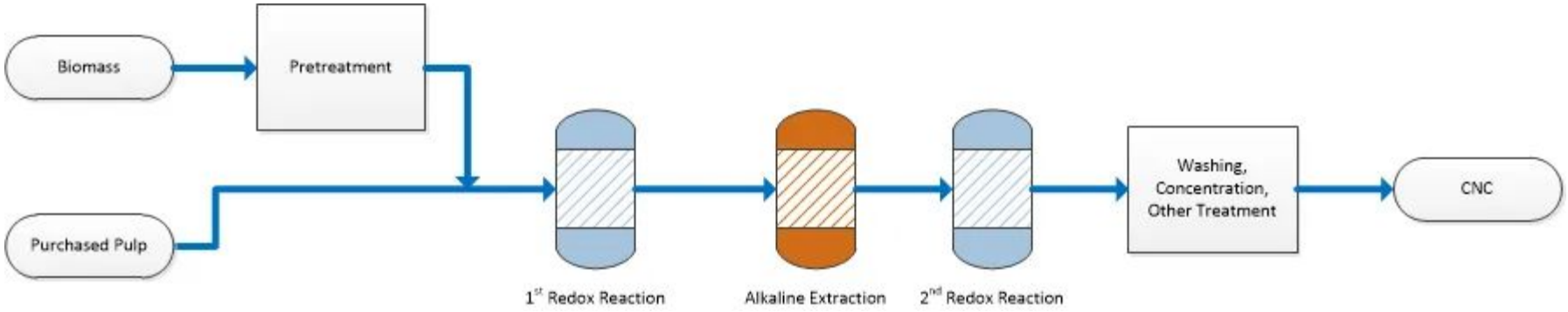
Applications

The company claims to have served 200 customers in 24 countries. In 2017, Nano-Green Biorefineries Inc., a BGB affiliate, signed a master license agreement with the Purdue Research Foundation granting BGB the commercial rights to use cellulose nanocrystals as a concrete admixture.

Blue Goose Biorefineries (BGB)

Manufacturing Capability

There is a pilot plant in Saskatoon that began production in 2014. The process used for the production of CNC is based on the transition metal catalyzed oxidation of lignocellulosic biomass. The plant is capable of producing CNCs in the gram-kilogram scale.



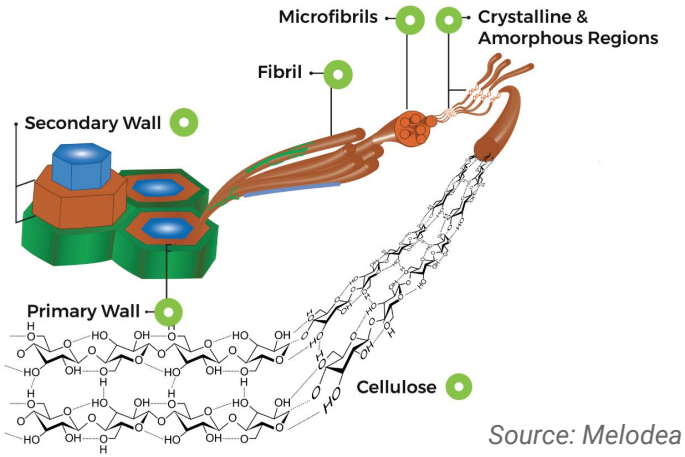
Process flow diagram for the production of CNC. Source BGB.

The process is simple and only requires that the components are well mixed in the right oxidant-to-biomass ratio. Since the process uses an aqueous environment, it can be easily integrated into a paper mill, as brown or bleached stock can be directly fed for the production of CNCs.

Melodea Ltd.

Overview

Melodea produces cellulose nanocrystals from wood pulp and paper production sidestreams.



Source: Melodea

Cellulose and CNCs

At a glance			
Founded:	2010	**Company Size:**	11-50 employees
Website:	https://melodea.eu/	**Headquarters:**	Rehovot, Israel
Contact:	info@melodea.eu	**Product Name:**	Melodea CNC

Melodea Ltd.

Applications

Packaging: Coatings from Melodea can be used in the packaging industry and serve as high-performing oxygen barriers, oil barriers, and water vapor barriers.

Paints & Coatings: The transparent CNCs can significantly improve the scratch and abrasion resistance of a painted surface. Only a small amount is needed.

Others: Their bio-based solutions can be applied to textile dyeing processes to increase efficiency, lower costs, and reduce waste. The company is also involved in several partnerships to produce bionanocomposite films along with architectural and industrial coatings.

References:

1. https://melodea.eu/
2. https://melodea.eu/wp-content/uploads/2019/09/bionanocomposite-films-from-resilin-cbd-bound-to-cellulose-nanocrystals-2015.pdf
3. https://www.jpost.com/Israel-News/Israel-US-foundation-commits-7m-to-eight-hi-tech-R-and-D-partnerships-498221

Melodea Ltd.

Product Portfolio

Melodea claims that their CNC product has the following features:

- 100% bio-based
- Lightweight
- Self-assembly and transparent
- Durable
- Abrasion resistant
- Oxygen barrier
- Rheology modifier
- Recyclable, compostable and biodegradable
- Highly compatible with water-based systems

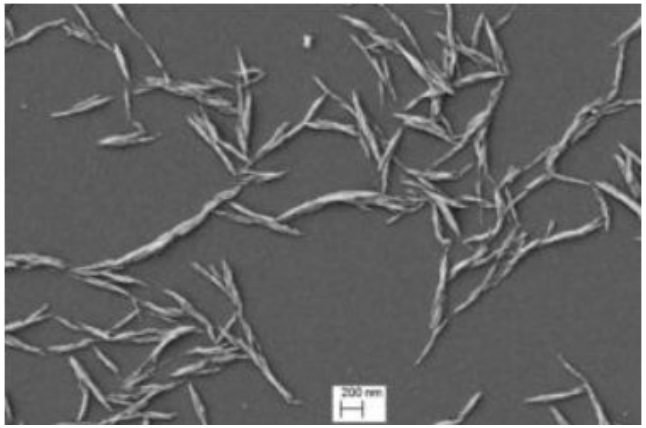
Manufacturing Capability

Melodea has in-house capability of producing CNCs. The scale is, however, unclear.

Nanocrystacell

Overview

Nanocrystacell is a privately held company based in Slovenia that produces biodegradable cellulose nanocrystal fibers made of wood cellulose. Their technology has won more than five industry awards.



Source: Nanocrystacell

At a glance			
Founded:	2009	**Company Size:**	11-50 employees
Website:	https://www.nanocrystacell.eu/	**Headquarters:**	Slovenia
Contact:	https://www.nanocrystacell.eu/#!/contact	**Product Name:**	Cellulose nanocrystals

Nanocrystacell

Product Portfolio

The nanocellulose produced by Nanocrystacell is available as a solid product as well as aqueous suspensions of various densities.

Color	White – translucent
Form	Aqueous gel, 6-10 wt.% solids
Surface	Hydrophilic
Average Size (Scherrer method, SEM)	10-15 nm wide,150-300 nm length
Crystallinity (XRD:Segal method)	90.3%
Initial decomposition temperature (DTGA in N2)	285 oC
Density	Aqueous gel: 1.04 g/cm3
Lignin content	Negligible

Recommended use of Nanocrystacell product is the following:

- NCC solution should be prepared in a liquid medium with a high-speed mixer.
- It should be used with ultrasound (with sonotrode) to disperse the NCC particles in a medium.

References:

1. https://www.nanocrystacell.eu/
2. https://nanocrystacell.si/trgovina/izdelki/

Innotech Materials

Overview

Innotech Materials is a private company based in Wisconsin, USA. Innotech Materials has an estimated revenue of <$1M. There is not much information about this company apart from the official website. The main emphasis is on their special patented technologies for modifying nanocellulose, which is still on the pilot and prototype scale.

At a glance			
Founded:	2014	**Company Size:**	<10 employees
Website:	http://www.innotechmaterials.com/	**Headquarters:**	Wisconsin, USA
Contact:	info@innotechmaterials.com	**Product Name:**	Modified nanocellulose

Innotech Materials

Product Overview

Innotech Materials has developed an innovative technology of producing a hydrophobic nanocellulose using catalytic oxidation of cellulose derivatives.

It is isolated as a white powder, soluble to organic solvents such as acetone and chloroform, and slowly melts at 200°C to form pale yellow gels. Thin films prepared from solvent casting are hydrophobic and impervious to water.

Therefore, it would be a suitable replacement of plastics for zero-waste, bioplastic packaging. Their goal is to produce bioplastics using an injection molding process.

Their major products are:

- Oxidized nanocellulose for applications in polymer biocomposites and water/air treatments.
- Hydrophobic nanocellulose for bioplastic packaging.
- Water soluble nanocellulose for personal care, cosmetics, and pharmaceuticals.
- Antimicrobial nanocellulose for applications in food, water treatment, and personal care products.
- Carboxylated nanocellulose for water treatment and nanodispersants.

Innotech Materials

Product Overview

Innotech Materials has developed catalytic oxidation and cleavage of cellulose for synthesis of oxidized nanocellulose using iron-activated peroxide oxidation. Cellulose is first oxidized to yield oxidized cellulose, which is subsequently cleaved to produce oxidized nanocellulose.

This catalytic cellulose cleavage is effective for making oxidized methyl nanocellulose and carboxymethyl nanocellulose from commercial cellulose.

The process is cost-effective, energy efficient, environmentally friendly, and produces inexpensive nanocellulose.

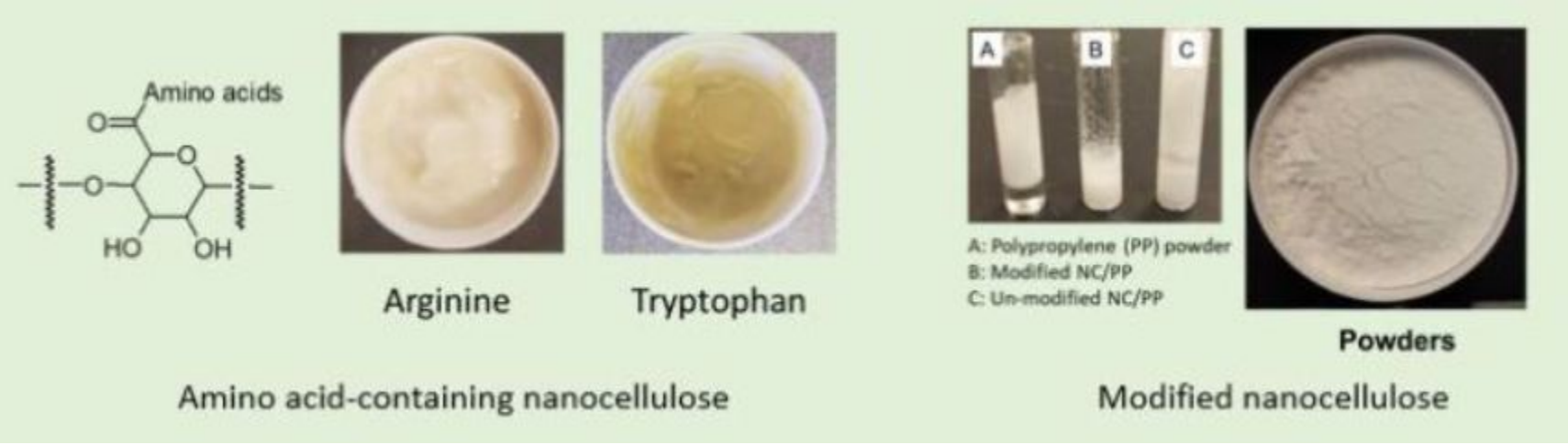
Source: Innotech Materials

Innotech Materials

Product Overview

Functional nanocellulose containing carboxylic acid ester, amides, and amino acids for pharmaceutical applications such as drug delivery and protein purification has been prepared using surface modification.

Inexpensive modified nanocellulose that is adhesive to hydrophobic polypropylene has been prepared and would be useful as a reinforcing agent for polymer composites and as a filtering agent to remove organic pollutants such as persistent organic compounds in water treatments.



Source: Innotech Materials

References:

1. https://challenges.openideo.com/challenge/circular-design/ideas/hydrophobic-nanocellulose-for-bioplastics

Nano/Micro-Fibrillated Cellulose

Sweetwater Energy

Overview

Sweetwater Energy company was founded in 2009 from New York State Energy Research and Development Authority (NYSERDA) funding and developed in collaboration with researchers at the Rochester Institute of Technology (RIT). Sweetwater Energy developed and refined a patented, biomass pretreatment system with the backing of a wide group of private investors.

The company has an estimated revenue of USD 1-10 million. In 2019, the first Sweetwoods commercial-scale facility was built.

At a glance			
Founded:	2009	**Company Size:**	11-50 employees
Website:	https://www.sweetwater.us/	**Headquarters:**	New York, USA
Contact:	info@sweetwater.us	**Product Name:**	Sunburst

Sweetwater Energy

Product Overview

Sweetwater developed patented technology named Sunburst. The main idea of the Sunburst technology is to deconstruct plant material, such as wood, into components that are efficient and clean enough to make thousands of products that today rely on petroleum and other nonrenewable sources. Many forms of cellulose are made, including nanofibrillated cellulose.

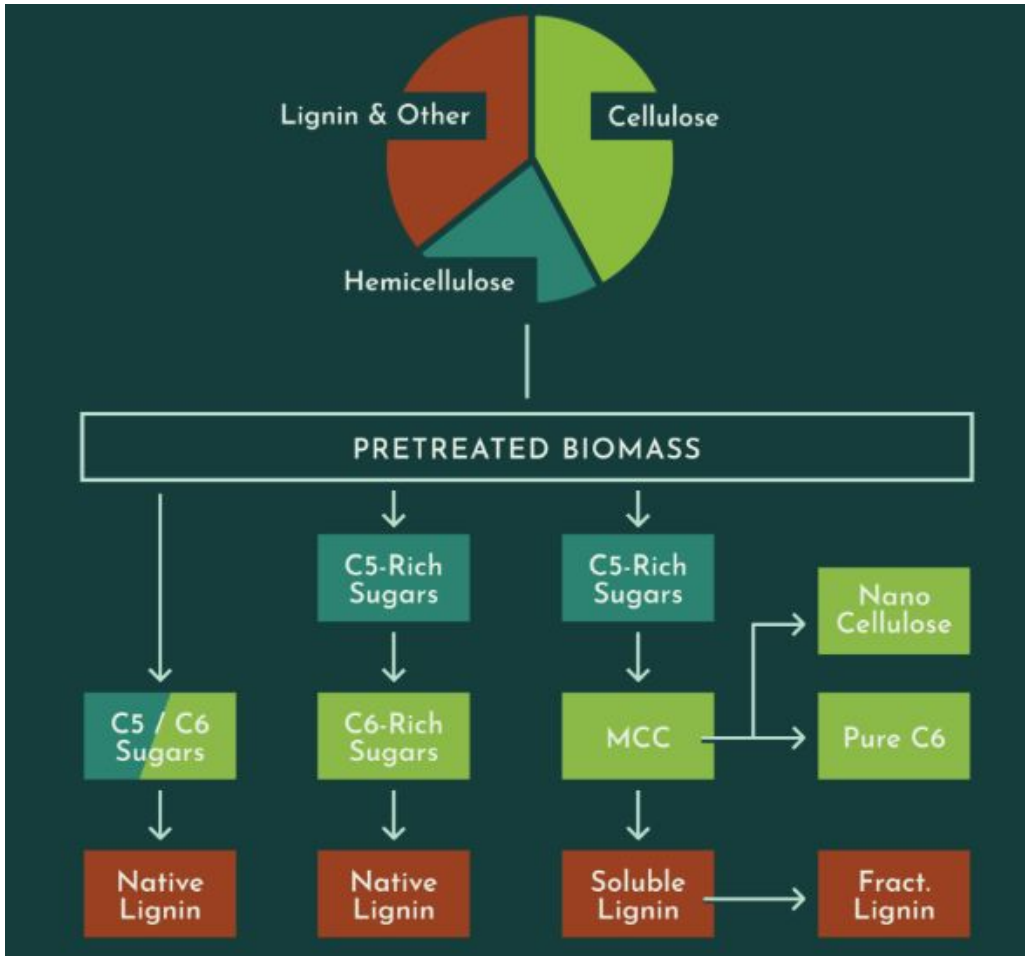
Nanofibrillated cellulose is obtained via the Sunburst process as a loosely agglomerated microcrystalline cellulose (MCC), which is further transformed into nanofibrillated cellulose. The process is very cost effective, with the use of a low amount of energy during production.

In addition to a manufacturing price well below the current market's, Sweetwater has the capability to make NFC in high volumes, opening up new market opportunities.

Sweetwater Energy

Product Overview

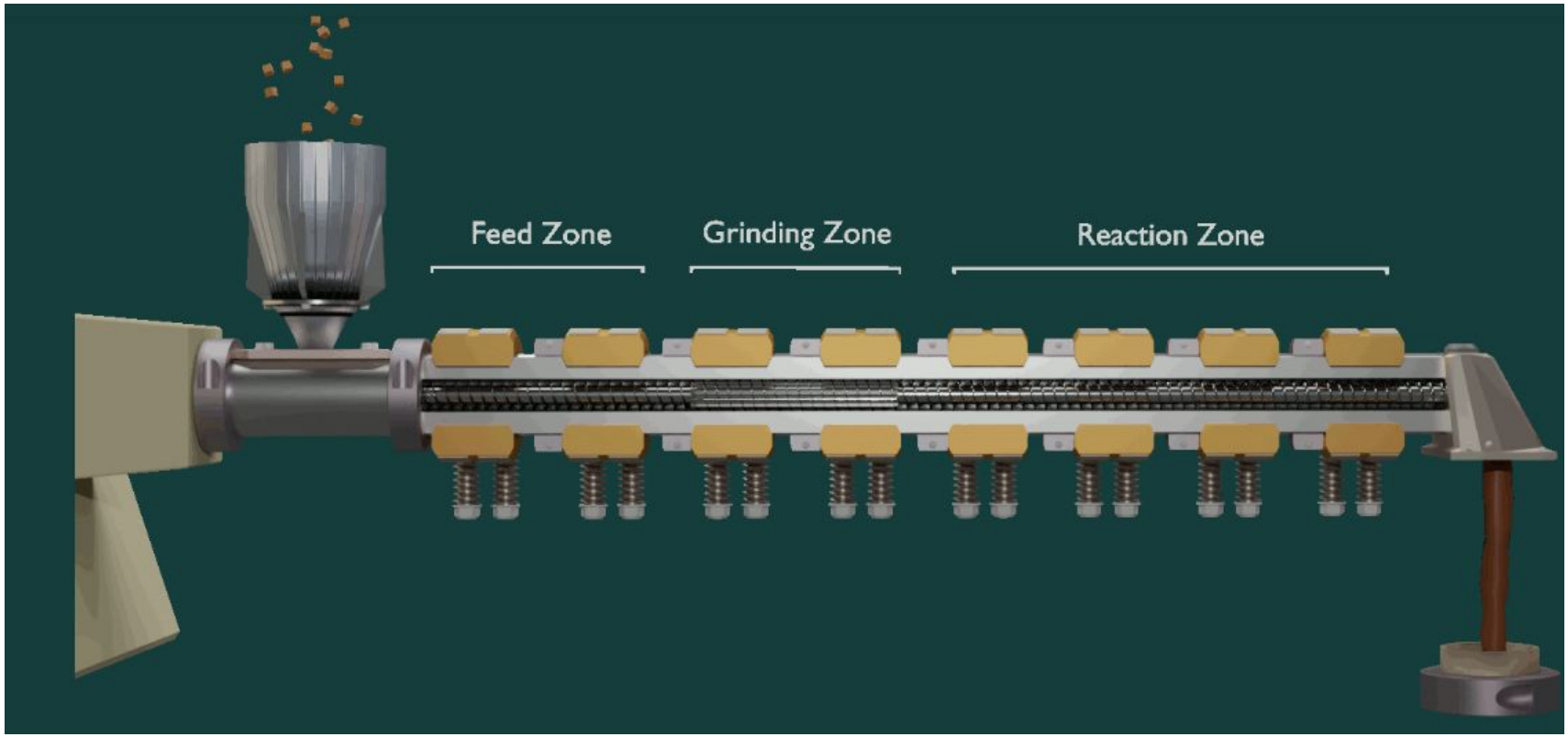
Schematic presentation of Sunburst's process.



Sweetwater Energy

Product Overview

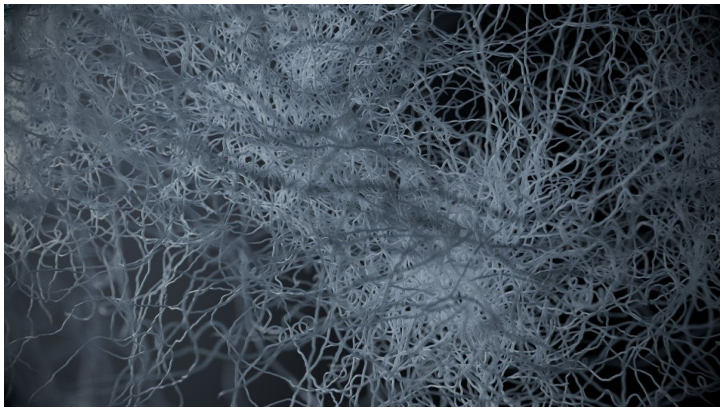
Sunburst's fabrication and operating costs are extremely low because the system is based on extrusion, a technology that has been the workhorse of countless industries for decades.



Exilva / Borregaard

Overview

Borregaard is a Norwegian company that owns and operates an advanced biorefinery. By using natural, sustainable raw materials, Borregaard produces advanced and environmentally friendly biochemicals, biomaterials, and bioethanol that replace oil-based products. Borregaard also holds strong positions in additives and fine chemicals.



At a glance			
Founded:	2016	**Company Size:**	11-50 employees
Website:	https://www.exilva.com/	**Headquarters:**	Sarpsborg, Norway
Contact:	exilvasales@borregaard.com	**Product Name:**	Exilva (Microfibrillated cellulose)

Exilva / Borregaard

Product Overview

Exilva is a new type of bio-based additive produced by Borregaard that is tailored to improve performance in waterborne and polar product systems. Its novel nature gives it rheological and mechanical functionalities.

- Exilva is an insoluble microfibrillated cellulose consistking of an entanglement of cellulose fibers that has the ability to interact both physically, through its extreme surface area, and chemically, through hydrogen bonding. Its novel nature gives it rheological and mechanical functionalities, which as an additive, imparts a unique combination of properties in finished product systems.
- The many benefits Exilva can deliver include improved performance in anti-settling and anti-sedimentation through improved yield stress along with versatility and flexibility in formulations through robustness to shear, pH, and temperature, as well as improving the sustainability profile.
- As a result of the fibrillation process, many hydroxyl groups become accessible to matrix in a network, resulting in a very high water retention capability. MFC will also retain its crystallinity features after the production process, providing a robust product.

Exilva / Borregaard

Product Overview

Adhesives

Agricultural Chemicals

Coatings

Personal Care

HI&I Cleaning

Constructions

Exilva / Borregaard

Benefits of Exilva

High Yield Stress

High yield stress giving improved stability of water borne or polar solvent systems at low shear

Pronounced Shear Thinning

Extreme shear thinning with very fast viscosity recovery provides benefits during applying of water borne or polar solvent systems.

High Surface Area

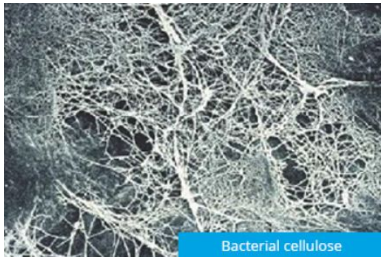
Very high surface area provides substantial binding benefits and film forming of high strength films

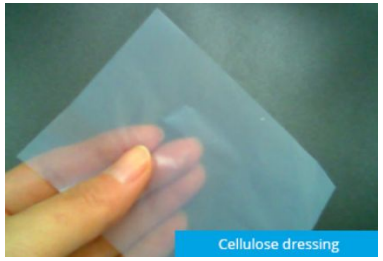
Bacterial Cellulose

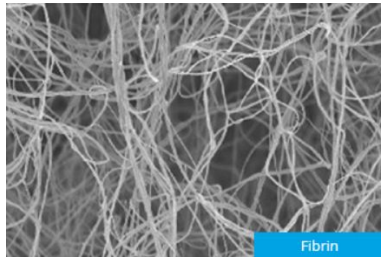
Axcelon Biopolymers Corporation

Overview

Axcelon Biopolymers Corp. (ABC) is a privately held company that has several proprietary assets in Toronto and London, Ontario, as well as Montreal. The company is developing and commercializing patented bacterial nanocellulose-based products for biomedical devices as well as for nonmedical applications. The company's emphasis is on the development of advanced wound care products, cardiovascular grafts, and tympanic membrane, as well as other high-value consumer products.







At a glance			
Founded:	2001	**Company Size:**	1-10 employees
Website:	http://axcelonbp.com/	**Headquarters:**	London, Ontario, Canada
Contact:	cpanchal@axcelonbp.com	**Product Name:**	Nanoderm and NanodermAg

Axcelon Biopolymers Corporation

Product Overview

There are two types of products: Nanoderm and NanodermAg (fibers with silver incorporated).

Both Nanoderm products are made from bacterial cellulose as a microfibrillar biosynthetic cellulose film for the one-time single application wound care product that simulates the skin's natural defenses (fibrin) to help promote quicker wound healing.

Mechanism of Nanoderm application action:

- The pore size created by the microfibrils and ribbons of the paper-thin membrane trap platelets and initiate coagulation, bringing about both haemostasis and adherence to the wound surface.
- The greater absorptive capacity of the membrane and its porous nature allow for the dissipation of exudate while maintaining a moist wound interface.
- Nanoderm acts as a regenerative tissue scaffold to affect fibroblast, endothelial, and keratinocyte function, enhancing granulation tissue formation and epithelization.
- The tensile strength of the material allows it to remain in place for longer periods with little need for dressing change.

Axcelon Biopolymers Corporation

Product Overview

Key Features:

- Nanofibrillar cellulose film
- Biocompatible with the human body
- Selective permeability (it retains fluids, but allows perspiration)
- Reduces electrolyte and protein loss
- Isolates the area from the environment, thereby eliminating any condition favoring microbial contamination
- One dressing application for most wound types

Key Benefits:

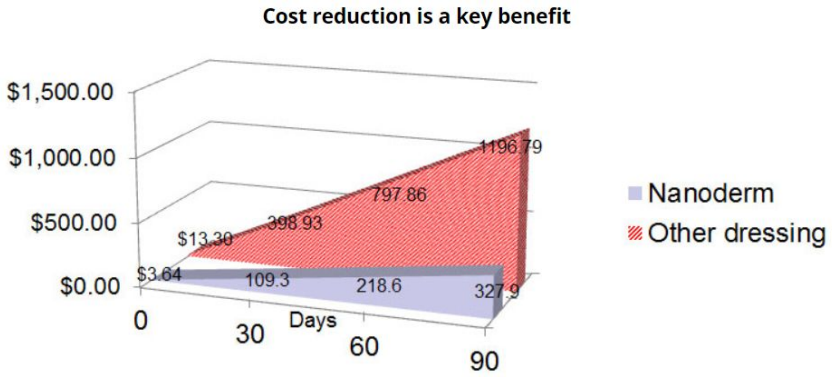
- Accelerates wound closure
- Significantly reduces pain
- Protects wound against bacterial infections
- Reduces need for frequent dressing changes
- Highly absorbent
- Reduces the overall cost of treatment
- Meets and exceeds all wound healing criteria

Axcelon Biopolymers Corporation

Manufacturing Capability

Axcelon Biopolymers has its demonstration bacterial nanocellulose (BNC) production facility in St. Félicien, Quebec, Canada. The project incorporates ABC's proprietary microbe to produce high-value bioproducts for wound care, medical devices, and industrial sectors. ABC also has other patents related to the medical device field in development, as well working to use BNC in 3D printing and electrospinning applications for the production of biocomposites of superior performance as compared to non-bio alternatives.

The project is located in the industrial park where it uses waste "warm water" energy that is rejected from a biomass power plant, which reduces operating costs. The ability to integrate with a biomass power plant will also significantly reduce ABC's GHG footprint and improve the energy efficiency of the power plant.



Total material and Nursing Costs*

*Axcelon data, up-dated from historic Canadian health-economic evaluation

Cost analysis of Nanoderm vs regular dressing.

References:

1. https://nanoderm.ca/
2. https://www.crunchbase.com/organization/axcelon-biopolymers-corporation#section-overview

Bowil Biotech

BOWIL | BIOTECH

Overview

Bowil Biotech is a Polish biotechnology company, with its expertise in manufacturing biocellulose in compliance with GMP pharmaceutical standards. Their method is based on the usage of highly efficient bacterial strain Gluconacetobacter xylinus E25.

The company currently owns seven patents regarding their product and manufacturing methods.

At a glance			
Founded:	2006	**Company Size:**	11-50 employees
Website:	https://bowil.pl/en/	**Headquarters:**	Wladyslawowo, Pomorskie, Poland
Contact:	info@bowil.pl	**Product Name:**	CelMat (bacterial nanocellulose)

Bowil Biotech

BOWIL | BIOTECH

Product Overview

Bowil focus on the biomedical applications of bacterial nanocellulose for the different type of wound dressings, face masks, and eye dressings. These products are held under the CelMat brand, which is addressed to aesthetic medicine, advanced skin treatment specialists, beauty salons, SPA centers, and skin-burn specialists.

Bowil Biotech

BOWIL | BIOTECH

Product Overview

- CelMat Face is a mask-shaped dressing whose hydrating properties enhance proper skin treatment. Moreover, it shows excellent results in anti-aging therapy, medical face treatment recovery, and skin revitalization. The characteristic features of the dressing are flexibility, high mechanical strength, and extremely high hydration (approx. 96%). That creates a proper moisturized environment and promotes the healing process in the skin after treatments. The effect of cooling is also important for comfort and pain relief. CelMat dressings absorb sebum from the skin much better than other masks. Selective permeability for gases and fluids ensure the proper transpiration and thermoregulation, which shorten the healing process.
- CelMat Eye is a goggle-shaped dressing that was designed particularly for sensitive skin around the eyes. Its nontoxic and nonallergic properties make this dressing suitable for every type of skin, especially before and after medical procedures.
- CelMat Wound is designed for injury treatment. It gives the effect of cooling, which supports pain relief. Moreover, it can also absorb fluids from the wounds. Selective permeability for gases and fluids ensure the proper transpiration and thermoregulation, which shorten the healing process.

References:

1. https://bowil.pl/en/

Next Steps

About the Authors

Marija Jović, Technical Director

PreScouter

Professional Summary:

Marija has been a Project Architect with PreScouter since January 2015. She finished her Master's degree in Chemical Engineering from Belgrade University and completed her PhD in Organometallic Chemistry and Catalysis at the Swiss Federal Institute of Technology (ETH Zurich). Marija's academic research was focused on understanding reaction mechanisms in order to rationally design catalysts for polymerization and metathesis reactions. Prior to her PhD, Marija worked in chemical industry on synthesis of new textile dyes.

Research Background:

Polymer Chemistry and Engineering, Materials Science, Catalysis, Innovative Technologies

About the Authors

Piyush Ingale, Technical Project Manager

PreScouter

Professional Summary:

Piyush's research focuses on the development of novel nanostructured porous materials for applications in catalysis and energy related applications. Enhancing surface properties, modification of porosity and surface area as well as novel structures are some of the key activities. The work is more inclined towards an interdisciplinary approach bridging chemical engineering and material science. The work of his graduate thesis was on the topic of "Development of bifunctional gas diffusion catalyst for rechargeable Zn/air battery using ionic liquid as an electrolyte." Because of the inherent problems associated with cathode materials as well as electrolyte in state-of-the-art Zn/air technology, the aim of his thesis was focused on development of lanthanum and Pt based gas diffusion electrodes that can support oxygen reduction and evolution reactions in ionic liquids. In this work we are able to show the rechargeable Zn/air battery with ionic liquid electrolyte having exceptional cycling stability of more than 2000 h.

Research Background:

Porous materials, Metal-air battery, Cathode development, Zeolites, Nanomaterials, Electrolyte development

About the Authors

Dusica Radjenovic

Freie Universität Berlin, Germany

Vasudevan Lakshminarayanan

Delft University of Technology, Netherlands

Next Steps

SOME POSSIBILITIES THAT PRESCOUTER CAN OFFER FOR CONTINUATION OF OUR RELATIONSHIP

- ☑ COMPETITIVE INTELLIGENCE
- ☑ TECHNOLOGY ROADMAPPING
- ☑ TECHNOLOGY & PATENT LANDSCAPING
- ☑ MARKET RESEARCH & ANALYSIS
- ☑ TRENDS MAPPING
- ☑ REVIEW BEST PRACTICES
- ☑ PATENT COMMERCIALIZATION STRATEGY
- ☑ DATA ANALYSIS & RECOMMENDATIONS
- ☑ ACQUIRE NON-PUBLIC INFORMATION
- ☑ SUPPLIER OUTREACH & ANALYSIS
- ☑ CONSULT WITH INDUSTRY SUBJECT MATTER EXPERTS
- ☑ INTERVIEWING COMPANIES & EXPERTS

WE CAN ALSO DO THE FOLLOWING

- ✔ **CONFERENCE SUPPORT:** Attend conferences of interest on your behalf.
- ✔ **WRITING ARTICLES:** Write technical or more public-facing articles on your behalf.
- ✔ **WORKING WITH A CONTRACT RESEARCH ORGANIZATION:** Engage with a CRO to build a prototype, test equipment, or any other related research service.

For any requests, we welcome your additional questions and custom building a solution for you.

About PreScouter

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